NEW AGE

MCQs in Biochemistry

G. Vidya Sagar

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G. Vidya Sagar
Director and Principal
Veerayatan Institute of Pharmacy
Mandvi, Kutch (Gujarat)
Dean, Faculty of Pharmaceutical Sciences
KSKV Kachchh University
Bhuj (Gujarat)

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Dedicated to

PROF. DR. F.V. MANVI

Secretary

KLE Society, BELGAUM

KARNATAKA.

"To My First Pharmacy teacher with Love"

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FOREWORD

Competitive Examinations are the order of the day. All Colleges conducting professional courses at PG level are admitting students based on common entrance examination, which is of objective type.

In Pharmacy, M.Pharm admissions are based on qualifying the GATE enterance examination conducted by Govt. of India.

In this book, The author has done good work in preparing several objective questions which help the students to face the subject in the examination with poise and confidence.

The book is well balanced and consists of multiple choice questions from all the important topics like carbohydrate metabolism and other important Biochemical aspects.

The typesetting and quality of printing is good. The author is also well experienced in taking up this type of work.

I recommend this book to all the students preparing for GATE examination and also for Medical and Pharmacy College libraries.

PROF. B.G. SHIVANANDA
Principal
AL-AMEEN COLLEGE OF PHARMACY
BANGALORE.

PREFACE

I have brought out this book basically for students who plan to appear for Biochemistry in the entrance examinations like JIPMER and other Medical, Pharmacy, Physiotherapy, Nursing and other Paramedical PG Entrance Examinations. There is a dearth of good entrance manual of Biochemistry for the above said examinations. Hence, I have prepared an exhaustive Question bank of around 5000 MCQs with answers covering a wide spectrum of basic Biochemical topics of the subject.

Some of the important topics which are given a good coverage include Carbohydrate metabolism, Protein metabolism, Lipid metabolism, Nucleic acids, Enzymes, Vitamins and Mineral metabolism.

The objective questions are prepared based on the background taken from previous question papers of Professional medical and Paramedical competitive entrance examinations.

The book serves as a ready reckoner for Biochemistry as far as objective pattern is concerned. I feel satisfied if the book serves the purpose for which it is intended.

I have tried to minimize typographical errors but still some must have crept in. If they are brought to my notice, I will be rectifying them in the next edition.

Constructive Criticism is always welcome

G. Vidya Sagar

ACKNOWLEDGEMENTS

I wish to express my profound gratitude and benevolence to the following who were the inspiring force in making this book a reality

- **Sadhvi Shilapiji**
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- **Prof. Dr. Srinivas Rao**
  Principal, VEL's College of Pharmacy
  Chennai

Finally, I express my gratitude to Mr. Saumya Gupta. MD, New Age International (P) Limited, New Delhi, for his encouragement and support.

Dr. G.Vidya Sagar

SOME VALUABLE COMMENTS

- This book is very useful for students appearing for GATE Exams. Recommended reading.

Prof. Dr. Subhas C. Marihal
Principal, Goa College of Pharmacy, Goa.

- Biochemistry made simple in the form of multiple choice questions. Strongly recommended.

Prof. Dr. Vijaykumar Ishwar Hukkeri
Principal, KLE College of Pharmacy, Hubli

- Dr. Vidya Sagar can be applauded for his untiring efforts in bringing out such a good book. Recommended for students and Library

Dr. G. Devala Rao
Principal, Sidhartha College of Pharmaceutical Sciences
Vijaywada, A.P.

- This book will be very useful companion for students appearing for PG Medical, Pharmacy, Nursing and Physiotherapy competitive exams.

Prof. Dr. T.K. Ravi
Principal, Sri Ramakrishna Institute of Pharmaceutical Science
Coimbatore.

- MCQs are well framed, mostly from previous entrance examinations. Commendable work.

Prof. Madhukar R. Tajne
Deptt. of Pharmaceutical Sciences,
Nagpur University, Nagpur

CONTENTS

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CHAPTER 1

INTRODUCTION TO BIOCHEMISTRY

1. A drug which prevents uric acid synthesis by inhibiting the enzyme xanthine oxidase is

(A) Aspirin (B) Allopurinol
(C) Colchicine (D) Probenecid

2. Which of the following is required for crystallization and storage of the hormone insulin?

(A) Mn^{++} (B) Mg^{++}
(C) Ca^{++} (D) Zn^{++}

3. Oxidation of which substance in the body yields the most calories

(A) Glucose (B) Glycogen
(C) Protein (D) Lipids

4. Milk is deficient in which vitamins?

(A) Vitamin C (B) Vitamin A
(C) Vitamin B_2 (D) Vitamin K

5. Milk is deficient of which mineral?

(A) Phosphorus (B) Sodium
(C) Iron (D) Potassium

6. Synthesis of prostaglandinsis is inhibited by

(A) Aspirin (B) Arsenic
(C) Fluoride (D) Cyanide

7. HDL is synthesized and secreted from

(A) Pancreas (B) Liver
(C) Kidney (D) Muscle

8. Which are the cholesterol esters that enter cells through the receptor-mediated endocytosis of lipoproteins hydrolyzed?

(A) Endoplasmin reticulum
(B) Lysosomes
(C) Plasma membrane receptor
(D) Mitochondria

9. Which of the following phospholipids is localized to a greater extent in the outer leaflet of the membrane lipid bilayer?

(A) Choline phosphoglycerides
(B) Ethanolamine phosphoglycerides
(C) Inositol phosphoglycerides
(D) Serine phosphoglycerides

10. All the following processes occur rapidly in the membrane lipid bilayer except

(A) Flexing of fatty acyl chains
(B) Lateral diffusion of phospholipids
(C) Transbilayer diffusion of phopholipids
(D) Rotation of phospholipids around their long axes

11. Which of the following statement is correct about membrane cholesterol?

(A) The hydroxyl group is located near the centre of the lipid layer
(B) Most of the cholesterol is in the form of a cholesterol ester
(C) The steroid nucleus form forms a rigid, planar structure

(D) The hydrocarbon chain of cholesterol projects into the extracellular fluid

12. Which one is the heaviest particulate component of the cell?

(A) Nucleus (B) Mitochondria
(C) Cytoplasm (D) Golgi apparatus

13. Which one is the largest particulate of the cytoplasm?

(A) Lysosomes
(B) Mitochondria
(C) Golgi apparatus
(D) Entoplasmic reticulum

14. The degradative Processess are categorized under the heading of

(A) Anabolism (B) Catabolism
(C) Metabolism (D) None of the above

15. The exchange of material takes place

(A) Only by diffusion
(B) Only by active transport
(C) Only by pinocytosis
(D) All of these

16. The average pH of Urine is

(A) 7.0 (B) 6.0
(C) 8.0 (D) 0.0

17. The pH of blood is 7.4 when the ratio between H_2CO_3 and $NaHCO_3$ is

(A) 1 : 10 (B) 1 : 20
(C) 1 : 25 (C) 1 : 30

18. The phenomenon of osmosis is opposite to that of

(A) Diffusion (B) Effusion
(C) Affusion (D) Coagulation

19. The surface tension in intestinal lumen between fat droplets and aqueous medium is decreased by

(A) Bile Salts (B) Bile acids
(C) Conc. H_2SO_4 (D) Acetic acid

20. Which of the following is located in the mitochondria?

(A) Cytochrome oxidase
(B) Succinate dehydrogenase
(C) Dihydrolipoyl dehydrogenase
(C) All of these

21. The most active site of protein synthesis is the

(A) Nucleus (B) Ribosome
(C) Mitochondrion (D) Cell sap

22. The fatty acids can be transported into and out of mitochondria through

(A) Active transport
(B) Facilitated transfer
(C) Non-facilitated transfer
(D) None of these

23. Mitochondrial DNA is

(A) Circular double stranded
(B) Circular single stranded
(C) Linear double helix
(D) None of these

24. The absorption of intact protein from the gut in the foetal and newborn animals takes place by

(A) Pinocytosis (B) Passive diffusion
(C) Simple diffusion (D) Active transport

25. The cellular organelles called "suicide bags" are

(A) Lysosomes (B) Ribosomes
(C) Nucleolus (D) Golgi's bodies

26. From the biological viewpoint, solutions can be grouped into

(A) Isotonic solution
(B) Hypotonic solutions
(C) Hypertonic solution
(D) All of these

27. Bulk transport across cell membrane is accomplished by

(A) Phagocytosis (B) Pinocytosis
(C) Extrusion (D) All of these

28. The ability of the cell membrane to act as a selective barrier depends upon

(A) The lipid composition of the membrane
(B) The pores which allows small molecules
(C) The special mediated transport systems
(D) All of these

29. Carrier protein can

(A) Transport only one substance
(B) Transport more than one substance
(C) Exchange one substance to another
(D) Perform all of these functions

30. A lipid bilayer is permeable to

(A) Urea (B) Fructose
(C) Glucose (D) Potassium

31. The Golgi complex

(A) Synthesizes proteins
(B) Produces ATP
(C) Provides a pathway for transporting chemicals
(D) Forms glycoproteins

32. The following points about microfilaments are true except

(A) They form cytoskeleton with microtubules
(B) They provide support and shape
(C) They form intracellular conducting channels
(D) They are involved in muscle cell contraction

33. The following substances are cell inclusions except

(A) Melanin (B) Glycogen
(C) Lipids (D) Centrosome

34. Fatty acids can be transported into and out of cell membrane by

(A) Active transport (B) Facilitated transport
(C) Diffusion (D) Osmosis

35. Enzymes catalyzing electron transport are present mainly in the

(A) Ribosomes
(B) Endoplasmic reticulum
(C) Lysosomes
(D) Inner mitochondrial membrane

36. Mature erythrocytes do not contain

(A) Glycolytic enzymes (B) HMP shunt enzymes
(C) Pyridine nucleotide (D) ATP

37. In mammalian cells rRNA is produced mainly in the

(A) Endoplasmic reticulum
(B) Ribosome
(C) Nucleolus
(D) Nucleus

38. Genetic information of nuclear DNA is transmitted to the site of protein synthesis by

(A) rRNA (B) mRNA
(C) tRNA (D) Polysomes

39. The power house of the cell is

(A) Nucleus (B) Cell membrane
(C) Mitochondria (D) Lysosomes

40. The digestive enzymes of cellular compounds are confined to

(A) Lysosomes (B) Ribosomes
(C) Peroxisomes (D) Polysomes

ANSWERS

1. B	2. D	3. D	4. A	5. C	6. A
7. B	8. B	9. A	10. C	11. C	12. A
13. B	14. B	15. D	16. B	17. B	18. A
19. A	20. D	21. B	22. B	23. A	24. A
25. A	26. D	27. D	28. D	29. D	30. A
31. D	32. C	33. D	34. B	35. D	36. C
37. C	38. D	39. C	40. A		

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CHAPTER 2

CARBOHYDRATES AND CARBOHYDRATE METABOLISM

1. The general formula of monosaccharides is

(A) $C_nH_{2n}O_n$ (B) $C_{2n}H_2O_n$
(C) $C_nH_2O_{2n}$ (D) $C_nH_{2n}O_{2n}$

2. The general formula of polysaccharides is

(A) $(C_6H_{10}O_5)_n$ (B) $(C_6H_{12}O_5)_n$
(C) $(C_6H_{10}O_6)_n$ (D) $(C_6H_{10}O_6)_n$

3. The aldose sugar is

(A) Glycerose (B) Ribulose
(C) Erythrulose (D) Dihydoxyacetone

4. A triose sugar is

(A) Glycerose (B) Ribose
(C) Erythrose (D) Fructose

5. A pentose sugar is

(A) Dihydroxyacetone (B) Ribulose
(C) Erythrose (D) Glucose

6. The pentose sugar present mainly in the heart muscle is

(A) Lyxose (B) Ribose
(C) Arabinose (D) Xylose

7. Polysaccharides are

(A) Polymers (B) Acids
(C) Proteins (D) Oils

8. The number of isomers of glucose is

(A) 2 (B) 4
(C) 8 (D) 16

9. Two sugars which differ from one another only in configuration around a single carbon atom are termed

(A) Epimers (B) Anomers
(C) Optical isomers (D) Stereoisomers

10. Isomers differing as a result of variations in configuration of the —OH and —H on carbon atoms 2, 3 and 4 of glucose are known as

(A) Epimers (B) Anomers
(C) Optical isomers (D) Steroisomers

11. The most important epimer of glucose is

(A) Galactose (B) Fructose
(C) Arabinose (D) Xylose

12. α-D-glucose and β-D-glucose are

(A) Stereoisomers (B) Epimers
(C) Anomers (D) Keto-aldo pairs

13. α-D-glucose + $112^0 \rightarrow$ + $52.5^0 \leftarrow$ + 19^0 β-D-glucose for glucose above represents

(A) Optical isomerism (B) Mutarotation
(C) Epimerisation (D) D and L isomerism

14. Compounds having the same structural formula but differing in spatial configuration are known as

(A) Stereoisomers (B) Anomers
(C) Optical isomers (D) Epimers

15. In glucose the orientation of the —H and —OH groups around the carbon atom 5 adjacent to the terminal primary alcohol carbon determines

(A) D or L series
(B) Dextro or levorotatory
(C) α and β anomers
(D) Epimers

16. The carbohydrate of the blood group substances is

(A) Sucrose (B) Fucose
(C) Arabinose (D) Maltose

17. Erythromycin contains

(A) Dimethyl amino sugar
(B) Trimethyl amino sugar
(C) Sterol and sugar
(D) Glycerol and sugar

18. A sugar alcohol is

(A) Mannitol (B) Trehalose
(C) Xylulose (D) Arabinose

19. The major sugar of insect hemolymph is

(A) Glycogen (B) Pectin
(C) Trehalose (D) Sucrose

20. The sugar found in DNA is

(A) Xylose (B) Ribose
(C) Deoxyribose (D) Ribulose

21. The sugar found in RNA is

(A) Ribose (B) Deoxyribose
(C) Ribulose (D) Erythrose

22. The sugar found in milk is

(A) Galactose (B) Glucose
(C) Fructose (D) Lactose

23. Invert sugar is

(A) Lactose (B) Sucrose
(C) Hydrolytic products of sucrose
(D) Fructose

24. Sucrose consists of

(A) Glucose + glucose
(B) Glucose + fructose
(C) Glucose + galactose
(D) Glucose + mannose

25. The monosaccharide units are linked by $1 \rightarrow 4$ glycosidic linkage in

(A) Maltose (B) Sucrose
(C) Cellulose (D) Cellobiose

26. Which of the following is a non-reducing sugar?

(A) Isomaltose (B) Maltose
(C) Lactose (D) Trehalose

27. Which of the following is a reducing sugar?

(A) Sucrose (B) Trehalose
(C) Isomaltose (D) Agar

28. A dissaccharide formed by 1,1-glycosidic linkage between their monosaccharide units is

(A) Lactose (B) Maltose
(C) Trehalose (D) Sucrose

29. A dissaccharide formed by 1,1-glycosidic linkage between their monosaccharide units is

(A) Lactose (B) Maltose
(C) Trehalose (D) Sucrose

30. Mutarotation refers to change in

(A) pH (B) Optical rotation
(C) Conductance (D) Chemical properties

31. A polysacchharide which is often called animal starch is

(A) Glycogen (B) Starch
(C) Inulin (D) Dextrin

32. The homopolysaccharide used for intravenous infusion as plasma substitute is

(A) Agar (B) Inulin
(C) Pectin (D) Starch

33. The polysaccharide used in assessing the glomerular fittration rate (GFR) is

(A) Glycogen (B) Agar
(C) Inulin (D) Hyaluronic acid

34. The constituent unit of inulin is

(A) Glucose (B) Fructose
(C) Mannose (D) Galactose

35. The polysaccharide found in the exoskeleton of invertebrates is

(A) Pectin (B) Chitin
(C) Cellulose (D) Chondroitin sulphate

36. Which of the following is a heteroglycan?

(A) Dextrins (B) Agar
(C) Inulin (D) Chitin

37. The glycosaminoglycan which does not contain uronic acid is

(A) Dermatan sulphate
(B) Chondroitin sulphate
(C) Keratan sulphate
(D) Heparan sulphate

38. The glycosaminoglycan which does not contain uronic acid is

(A) Hyaluronic acid
(B) Heparin
(C) Chondroitin sulphate
(D) Dermatan sulphate

39. Keratan sulphate is found in abundance in

(A) Heart muscle (B) Liver
(C) Adrenal cortex (D) Cornea

40. Repeating units of hyaluronic acid are

(A) N-acetyl glucosamine and D-glucuronic acid
(B) N-acetyl galactosamine and D-glucuronic acid
(C) N-acetyl glucosamine and galactose
(D) N-acetyl galactosamine and L- iduronic acid

41. The approximate number of branches in amylopectin is

(A) 10 (B) 20
(C) 40 (D) 80

42. In amylopectin the intervals of glucose units of each branch is

(A) 10–20 (B) 24–30
(C) 30–40 (D) 40–50

43. A polymer of glucose synthesized by the action of leuconostoc mesenteroids in a sucrose medium is

(A) Dextrans (B) Dextrin
(C) Limit dextrin (D) Inulin

44. Glucose on reduction with sodium amalgam forms

(A) Dulcitol (B) Sorbitol
(C) Mannitol (D) Mannitol and sorbitol

45. Glucose on oxidation does not give

(A) Glycoside (B) Glucosaccharic acid
(C) Gluconic acid (D) Glucuronic acid

46. Oxidation of galactose with conc HNO_3 yields

(A) Mucic acid (B) Glucuronic acid
(C) Saccharic acid (D) Gluconic acid

47. A positive Benedict's test is not given by

(A) Sucrose (B) Lactose
(C) Maltose (D) Glucose

48. Starch is a

(A) Polysaccharide (B) Monosaccharide
(C) Disaccharide (D) None of these

49. A positive Seliwanoff's test is obtained with

(A) Glucose (B) Fructose
(C) Lactose (D) Maltose

50. Osazones are not formed with the

(A) Glucose (B) Fructose
(C) Sucrose (D) Lactose

51. The most abundant carbohydrate found in nature is

(A) Starch (B) Glycogen
(C) Cellulose (D) Chitin

52. Impaired renal function is indicated when the amount of PSP excreted in the first 15 minutes is

(A) 20% (B) 35%
(C) 40% (D) 45%

53. An early feature of renal disease is

(A) Impairment of the capacity of the tubule to perform osmotic work

(B) Decrease in maximal tubular excretory capacity
(C) Decrease in filtration factor
(D) Decrease in renal plasma flow

54. ADH test is based on the measurement of

(A) Specific gravity of urine
(B) Concentration of urea in urine
(C) Concentration of urea in blood
(D) Volume of urine in ml/minute

55. The specific gravity of urine normally ranges from

(A) 0.900–0.999 (B) 1.003–1.030
(C) 1.000–1.001 (D) 1.101–1.120

56. Specific gravity of urine increases in

(A) Diabetes mellitus
(B) Chronic glomerulonephritis
(C) Compulsive polydypsia
(D) Hypercalcemia

57. Fixation of specific gravity of urine to 1.010 is found in

(A) Diabetes insipidus
(B) Compulsive polydypsia
(C) Cystinosis
(D) Chronic glomerulonephritis

58. Addis test is the measure of

(A) Impairment of the capacity of the tubule to perform osmotic work
(B) Secretory function of liver
(C) Excretory function of liver
(D) Activity of parenchymal cells of liver

59. Number of stereoisomers of glucose is

(A) 4 (B) 8
(C) 16 (D) None of these

60. Maltose can be formed by hydrolysis of

(A) Starch (B) Dextrin
(C) Glycogen (D) All of these

61. α–D–Glucuronic acid is present in

(A) Hyaluronic acid (B) Chondroitin sulphate
(C) Heparin (D) All of these

62. Fructose is present in hydrolysate of

(A) Sucrose (B) Inulin
(C) Both of the above (D) None of these

63. A carbohydrate found in DNA is

(A) Ribose (B) Deoxyribose
(C) Ribulose (D) All of these

64. Ribulose is a these

(A) Ketotetrose (B) Aldotetrose
(C) Ketopentose (D) Aldopentose

65. A carbohydrate, commonly known as dextrose is

(A) Dextrin (B) D-Fructose
(C) D-Glucose (D) Glycogen

66. A carbohydrate found only in milk is

(A) Glucose (B) Galactose
(C) Lactose (D) Maltose

67. A carbohydrate, known commonly as invert sugar, is

(A) Fructose (B) Sucrose
(C) Glucose (D) Lactose

68. A heteropolysacchraide among the following is

(A) Inulin (B) Cellulose
(C) Heparin (D) Dextrin

69. The predominant form of glucose in solution is

(A) Acyclic form
(B) Hydrated acyclic form
(C) Glucofuranose
(D) Glucopyranose

70. An L-isomer of monosaccharide formed in human body is

(A) L-fructose (B) L-Erythrose
(C) L-Xylose (D) L-Xylulose

71. Hyaluronic acid is found in

(A) Joints (B) Brain
(C) Abdomen (D) Mouth

72. The carbon atom which becomes asymmetric when the straight chain form of monosaccharide changes into ring form is known as

(A) Anomeric carbon atom
(B) Epimeric carbon atom
(C) Isomeric carbon atom
(D) None of these

73. The smallest monosaccharide having furanose ring structure is

(A) Erythrose (B) Ribose
(C) Glucose (D) Fructose

74. Which of the following is an epimeric pair?

(A) Glucose and fructose
(B) Glucose and galactose
(C) Galactose and mannose
(D) Lactose and maltose

75. α-Glycosidic bond is present in

(A) Lactose (B) Maltose
(C) Sucrose (D) All of these

76. Branching occurs in glycogen approximately after every

(A) Five glucose units
(B) Ten glucose units
(C) Fifteen glucose units
(D) Twenty glucose units

77. N–Acetylglucosamnine is present in

(A) Hyaluronic acid (B) Chondroitin sulphate
(C) Heparin (D) All of these

78. Iodine gives a red colour with

(A) Starch (B) Dextrin
(C) Glycogen (D) Inulin

79. Amylose is a constituent of

(A) Starch (B) Cellulose
(C) Glycogen (D) None of these

80. Synovial fluid contains

(A) Heparin
(B) Hyaluronic acid
(C) Chondroitin sulphate
(D) Keratin sulphate

81. Gluconeogenesis is decreased by

(A) Glucagon (B) Epinephrine
(C) Glucocorticoids (D) Insulin

82. Lactate formed in muscles can be utilised through

(A) Rapoport-Luebeling cycle
(B) Glucose-alanine cycle
(C) Cori's cycle
(D) Citric acid cycle

83. Glucose-6-phosphatase is not present in

(A) Liver and kidneys
(B) Kidneys and muscles
(C) Kidneys and adipose tissue
(D) Muscles and adipose tissue

84. Pyruvate carboxylase is regulated by

(A) Induction (B) Repression
(C) Allosteric regulation (D) All of these

85. Fructose-2, 6-biphosphate is formed by the action of

(A) Phosphofructokinase-1
(B) Phosphofructokinase-2
(C) Fructose biphosphate isomerase
(D) Fructose-1, 6-biphosphatase

86. The highest concentrations of fructose are found in

(A) Aqueous humor (B) Vitreous humor
(C) Synovial fluid (D) Seminal fluid

87. Glucose uptake by liver cells is

(A) Energy-consuming (B) A saturable process
(C) Insulin-dependent (D) Insulin-independent

88. Renal threshold for glucose is decreased in

(A) Diabetes mellitus (B) Insulinoma
(C) Renal glycosuria (D) Alimentary glycosuria

89. Active uptake of glucose is inhibited by

(A) Ouabain (B) Phlorrizin
(C) Digoxin (D) Alloxan

90. Glucose-6-phosphatase is absent or deficient in

(A) Von Gierke's disease
(B) Pompe's disease
(C) Cori's disease
(D) McArdle's disease

91. Debranching enzyme is absent in

(A) Cori's disease
(B) Andersen's disease
(C) Von Gierke's disease
(D) Her's disease

92. McArdle's disease is due to the deficiency of

(A) Glucose-6-phosphatase
(B) Phosphofructokinase
(C) Liver phosphorylase
(D) muscle phosphorylase

93. Tautomerisation is

(A) Shift of hydrogen (B) Shift of carbon
(C) Shift of both (D) None of these

94. In essential pentosuria, urine contains

(A) D-Ribose (B) D-Xylulose
(C) L-Xylulose (D) D-Xylose

95. Action of salivary amylase on starch leads to the formation of

(A) Maltose (B) Maltotriose
(C) Both of the above (D) Neither of these

96. Congenital galactosaemia can lead to

(A) Mental retardation
(B) Premature cataract
(C) Death
(D) All of the above

97. Uridine diphosphate glucose (UDPG) is

(A) Required for metabolism of galactose
(B) Required for synthesis of glucuronic acid
(C) A substrate for glycogen synthetase
(D) All of the above

98. Catalytic activity of salivary amylase requires the presence of

(A) Chloride ions (B) Bromide ions
(C) Iodide ions (D) All of these

99. The following is actively absorbed in the intestine:

(A) Fructose (B) Mannose
(C) Galactose (D) None of these

100. An amphibolic pathway among the following is

(A) HMP shunt (B) Glycolysis
(C) Citirc acid cycle (D) Gluconeogenesis

101. Cori's cycle transfers

(A) Glucose from muscles to liver
(B) Lactate from muscles to liver
(C) Lactate from liver to muscles
(D) Pyruvate from liver to muscles

102. Excessive intake of ethanol increases the ratio:

(A) NADH : NAD^+ (B) NAD^+ : NADH
(C) $FADH_2$: FAD (D) FAD : $FADH_2$

103. Ethanol decreases gluconeogenesis by

(A) Inhibiting glucose-6-phosphatase
(B) Inhibiting PEP carboxykinase
(C) Converting NAD^+ into NADH and decreasing the availability of pyruvate
(D) Converting NAD^+ into NADH and decreasing the availability of lactate

104. Glycogenin is

(A) Uncoupler of oxidative phosphorylation
(B) Polymer of glycogen molecules
(C) Protein primer for glycogen synthesis
(D) Intermediate in glycogen breakdown

105. During starvation, ketone bodies are used as a fuel by

(A) Erythrocytes (B) Brain
(C) Liver (D) All of these

106. Animal fat is in general

(A) Poor in saturated and rich in polyunsaturated fatty acids
(B) Rich in saturated and poor in polyunsaturated fatty acids
(C) Rich in saturated and polyunsaturated fatty acids
(D) Poor in saturated and polyunsaturated fatty acids

107. In the diet of a diabetic patient, the recommended carbohydrate intake should preferably be in the form of

(A) Monosaccharides (B) Dissaccharides
(C) Polysaccharides (D) All of these

108. Obesity increases the risk of

(A) Hypertension
(B) Diabetes mellitus
(C) Cardiovascular disease
(D) All of these

109. Worldwide, the most common vitamin deficiency is that of

(A) Ascorbic acid (B) Folic acid
(C) Vitamin A (D) Vitamin D

110. Consumption of iodised salt is recommended for prevention of

(A) Hypertension (B) Hyperthyroidism
(C) Endemic goitre (D) None of these

111. Restriction of salt intake is generally recommended in

(A) Diabetes mellitus (B) Hypertension
(C) Cirrhosis of liver (D) Peptic ulcer

112. Polyuria can occur in

(A) Diabetes mellitus
(B) Diarrhoea
(C) Acute glomerulonephritis
(D) High fever

113. Normal specific gravity of urine is

(A) 1.000–1.010 (B) 1.012–1.024
(C) 1.025–1.034 (D) 1.035–1.045

114. Specific gravity of urine is raised in all of the following except

(A) Diabetes mellitus
(B) Diabetes insipidus
(C) Dehydration
(D) Acute glomerulonephritis

115. Specific gravity of urine is decreased in

(A) Diabetes mellitus
(B) Acute glomerulonephritis
(C) Diarrhoea
(D) Chronic glomerulonephritis

116. Heavy proteinuria occurs in

(A) Acute glomerulonephritis
(B) Acute pyelonephritis
(C) Nephrosclerosis
(D) Nephrotic syndrome

117. Mucopolysaccharides are

(A) Hamopolysaccharides
(B) Hetropolysaccharides
(C) Proteins
(D) Amino acids

118. Bence-Jones protein precipitates at

(A) 20°–40° C (B) 40—60° C
(C) 60°–80° C (D) 80°–100° C

119. Serum cholesterol is decreased in

(A) Endemic goitre (B) Thyrotoxicosis
(C) Myxoedema (D) Cretinism

120. The heptose ketose sugar formed as a result of chemical reaction in HMP shunt:

(A) Sedoheptulose (B) Galactoheptose
(C) Glucoheptose (D) Mannoheptose

121. The general formula for polysaccharide is

(A) $(C_6H_{12}O_6)_n$ (B) $(C_6H_{10}O_5)_n$
(C) $(C_6H_{12}O_5)_n$ (D) $(C_6H_{19}O_6)_n$

122. The number of isomers of glucose is

(A) 4 (B) 8
(C) 12 (D) 16

123. The epimers of glucose is

(A) Fructose (B) Galactose
(C) Ribose (D) Deoxyribose

124. The intermediate in hexose monophosphate shunt is

(A) D-Ribolose (B) D-Arobinose
(C) D-xylose (D) D-lyxose

125. Honey contains the hydrolytic product of

(A) Lactose (B) Maltose
(C) Inulin (D) Starch

126. On boiling Benedict's solution is not reduced by

(A) Sucrose (B) Lactose
(C) Maltose (D) Fructose

127. Glycosides are found in many

(A) Vitamins (B) Drugs
(C) Minerals (D) Nucleoproteins

128. Galactose on oxidation with conc. HNO_3 produces

(A) Gluconic acid (B) Saccharic acid
(C) Saccharo Lactone (D) Mucic acid

129. The distinguishing test between monosaccharides and dissaccharides is

(A) Bial's test (B) Selwanoff's test
(C) Barfoed's test (D) Hydrolysis test

130. Cellulose is made up of the molecules of

(A) α-glucose (B) β-glucose
(C) Both of the above (D) None of these

131. Iodine solution produces no color with

(A) Cellulose (B) Starch
(C) Dextrin (D) Glycogen

132. Glycogen structure includes a branch in between–glucose units:

(A) 6–12 (B) 8–14
(C) 6–10 (D) 12–18

133. Amylose contains glucose units

(A) 100–200 (B) 200–300
(C) 300–400 (D) 500–600

134. Each branch of amylopectin is at an interval of glucose units:

(A) 14–20 (B) 24–30
(C) 34–40 (D) 44–50

135. N-acetylneuraminic acid is an example of

(A) Sialic acid (B) Mucic acid
(C) Glucuronic acid (D) Hippuric acid

136. In place of glucuronic acid chondroitin sulphate B contains

(A) Gluconic acid (B) Gulonic acid
(C) Induronic acid (D) Sulphonic acid

137. Blood group substances consist of

(A) Lactose (B) Maltose
(C) Fructose (D) Mucose

138. The component of cartilage and cornea is

(A) Keratosulphate
(B) Chondroitin sulphate
(C) Cadmium sulphate
(D) Antimony sulphate

139. Benedict's test is less likely to give weakly positive results with concentrated urine due to the action of

(A) Urea (B) Uric acid
(C) Ammonium salts (D) Phosphates

140. Active transport of sugar is depressed by the agent:

(A) Oxaloacetate (B) Fumarate
(C) Malonate (D) Succinate

141. The general test for detection of carbohydrates is

(A) Iodine test (B) Molisch test
(C) Barfoed test (D) Osazone test

142. Glucose absorption may be decreased in

(A) Oedema (B) Nephritis
(C) Rickets (D) Osteomalitis

143. Glycogen synthetase activity is depressed by

(A) Glucose (B) Insulin
(C) Cyclic AMP (D) Fructokinase

144. The branching enzyme acts on the glycogen when the glycogen chain has been lengthened to between glucose units:

(A) 1 and 6 (B) 2 and 7
(C) 3 and 9 (D) 6 and 11

145. Cyclic AMP is formed from ATP by the enzyme adenylate cyclase which is activated by the hormone:

(A) Insulin (B) Epinephrine
(C) Testosterone (D) Progesterone

146. Hexokinase has a high affinity for glucose than

(A) Fructokinase (B) Galactokinase
(C) Glucokinase (D) All of the above

147. Dihydroxyacetone phosphate and glyceraldehyde-3-phosphate are intercoverted by

(A) Triose isomerase
(B) Phosphotriose isomerase
(C) Diphosphotriose isomerase
(D) Dihydroxyacetone phosphorylase

148. Citrate is converted to isocitrate by aconitase which contains

(A) Ca^{++} (B) Fe^{++}
(C) Zn^{++} (D) Mg^{++}

149. The reaction succinyl COA to succinate requires

(A) CDP (B) ADP
(C) GDP (D) $NADP^{+}$

150. The carrier of the citric acid cycle is

(A) Succinate (B) Fumarate
(C) Malate (D) Oxaloacetate

151. UDPG is oxidized to UDP glucuronic acid by UDP dehydrogenase in presence of

(A) FAD^{+} (B) NAD^{+}
(C) $NADP^{+}$ (D) ADP^{+}

152. Galactose is phosphorylated by galactokinase to form

(A) Galactose-6-phosphate
(B) Galactose-1, 6 diphosphate
(C) Galactose-1-phosphate
(D) All of these

153. The conversion of alanine to glucose is termed

(A) Glycolysis
(B) Oxidative decarboxylation
(C) Specific dynamic action
(D) Gluconeogenesis

154. The blood sugar raising action of the hormones of suprarenal cortex is due to

(A) Gluconeogenesis
(B) Glycogenolysis
(C) Glucagon-like activity
(D) Due to inhibition of glomerular filtration

155. Under anaerobic conditions the glycolysis one mole of glucose yields __ moles of ATP.

(A) One (B) Two
(C) Eight (D) Thirty

156. Which of the following metabolite integrates glucose and fatty acid metabolism?

(A) Acetyl CoA (B) Pyruvate
(C) Citrate (D) Lactate

157. Cerebrosides consist of mostly of this sugar:

(A) Glucose (B) Fructose
(C) Galactose (D) Arabinose

158. Glucose will be converted into fatty acids if the diet has excess of

(A) Carbohydrates (B) Proteins
(C) Fat (D) Vitamins

159. The purple ring of Molisch reaction is due to

(A) Furfural
(B) Furfural + α Napthol
(C) °C Napthol
(D) Furfurol + H_2SO_4 + α -Naphthol

160. One of the following enzymes does not change glycogen synthase a to b.

(A) Glycogen synthase kinases 3, 4, 5
(B) Ca^{2+} calmodulin phosphorylase kinase
(C) Ca^{2+} calmodulin dependent protein kinase
(D) Glycogen phosphorylase a

161. In EM pathway-2-phosphoglycerate is converted to

(A) Phospho enol pyruvate
(B) Enol pyruvate
(C) Di hydroxy acetone phosphate (DHAP)
(D) 1,3 bisphosphoglycerate

162. An aneplerotic reaction which sustains the availability of oxaloacetate is the carboxylation of

(A) Glutamate (B) Pyruvate
(C) Citrate (D) Succinate

163. Specific test for ketohexoses:

(A) Seliwanoff's test (B) Osazone test
(C) Molisch test (D) None of these

164. Two important byproducts of HMP shunt are

(A) NADH and pentose sugars
(B) NADPH and pentose sugars

(C) Pentose sugars and 4 membered sugars
(D) Pentose sugars and sedoheptulose

165. Pyruvate dehydrogenase complex and α-ketoglutarate dehydrogenase complex require the following for their oxidative decarboxylation:

(A) COASH and Lipoic acid
(B) NAD^+ and FAD
(C) COASH and TPP
(D) COASH, TPP,NAD^+,FAD, Lipoate

166. The four membered aldose sugar phosphate formed in HMP shunt pathway is

(A) Xylulose P (B) Erythrulose P
(C) Erythrose P (D) Ribulose P

167. Cane sugar (Sucrose) injected into blood is

(A) changed to fructose
(B) changed to glucose
(C) undergoes no significant change
(D) changed to glucose and fructose

168. Pentose production is increased in

(A) HMP shunt
(B) Uromic acid pathway
(C) EM pathway
(D) TCA cycle

169. Conversion of Alanine to carbohydrate is termed:

(A) Glycogenesis (B) Gluconeogenesis
(C) Glycogenolysis (D) Photosynthesis

170. The following is an enzyme required for glycolysis:

(A) Pyruvate kinase
(B) Pyruvate carboxylase
(C) Glucose-6-phosphatase
(D) Glycerokinase

171. Our body can get pentoses from

(A) Glycolytic pathway
(B) Uromic acid pathway
(C) TCA cycle
(D) HMP shunt

172. Conversion of glucose to glucose-6-phosphate in human liver is by

(A) Hexokinase only
(B) Glucokinase only
(C) Hexokinase and glucokinase
(D) Glucose-6-phosphate dehydrogenase

173. The following is an enzyme required for glycolysis:

(A) Pyruvate kinase
(B) Pyruvate carboxylase
(C) Glucose-6-phosphatose
(D) Glycerokinase

174. The normal glucose tolerance curve reaches peak is

(A) 15 min (B) 1 hr
(C) 2 hrs (D) 2½ hrs

175. Oxidative decarboxylation of pyruvate requires

(A) $NADP^+$
(B) Cytichromes
(C) pyridoxal phosphate
(D) COASH

176. Glucose tolerance is increased in

(A) Diabetes mellitus (B) Adrenalectomy
(C) Acromegaly (D) Thyrotoxicosis

177. Glucose tolerance is decreased in

(A) Diabetes mellitus (B) Hypopituitarisme
(C) Addison's disease (D) Hypothyroidism

178. During glycolysis, Fructose 1,6 diphosphate is decomposed by the enzyme:

(A) Enolase a
(B) Fructokinase
(C) Aldolase
(D) Diphosphofructophosphatose

179. The following enzyme is required for the hexose monophosphate shunt pathway:

(A) Glucose-6-phosphatase
(B) Phosphorylase
(C) Aldolase
(D) Glucose-6-phosphate dehydrogenase

180 Dehydrogenase enzymes of the hexose monophosphate shunt are

(A) NAD^+ specific (B) $NADP^+$ specific
(C) FAD specific (D) FMN specific

181. Under anaerobic conditions the glycolysis of one mole of glucose yields _____moles of ATP.

(A) One (B) Two
(C) Eight (D) Thirty

182. Glycogen is converted to glucose-1-phosphate by

(A) UDPG transferase (B) Branching enzyme
(C) Phosphorylase (D) Phosphatase

183. Which of the following is not an enzyme involved in glycolysis?

(A) Euolase (B) Aldolose
(C) Hexokinase (D) Glucose oxidase

184. Tricarboxylic acid cycle to be continuous requires the regeneration of

(A) Pyruvic acid (B) oxaloacetic acid
(C) α-oxoglutaric acid (D) Malic acid

185. Dehydrogenation of succinic acid to fumaric acid requires the following hydrogen carrier:

(A) NAD^+ (B) $NADP^+$
(C) flavoprotein (D) Glutathione

186. The tissues with the highest total glycogen content are

(A) Muscle and kidneys
(B) Kidneys and liver
(C) Liver and muscle
(D) Brain and Liver

187. Rothera test is not given by

(A) β-hydroxy butyrate (B) bile salts
(C) Glucose (D) None of these

188. Gluconeogenesis is increased in the following condition:

(A) Diabetes insipidus (B) Diabetes Mellitus
(C) Hypothyroidism (D) Liver diseases

189. The oxidation of lactic acid to pyruvic acid requires the following vitamin derivative as the hydrogen carrier.

(A) Lithium pyrophosphate
(B) Coenyzme A
(C) NAD^+
(D) FMN

190. Physiological glycosuria is met with in

(A) Renal glycosuria
(B) Alimentary glycosuria
(C) Diabetes Mellitus
(D) Alloxan diabetes

191. Two examples of substrate level phosphorylation in EM pathway of glucose metabolism are in the reactions of

(A) 1,3 bisphosphoglycerate and phosphoenol pyruvate
(B) Glucose-6 phosphate and Fructo-6-phosphate
(C) 3 phosphoglyceraldehyde and phosphoenolpyruvate
(D) 1,3 diphosphoglycerate and 2-phosphoglycerate

192. The number of molecules of ATP produced by the total oxidation of acetyl CoA in TCA cycle is

(A) 6 (B) 8
(C) 10 (D) 12

193. Substrate level phosphorylation in TCA cycle is in step:

(A) Isocitrate dehydrogenase
(B) Malate dehydrogenase
(C) Aconitase
(D) Succinate thiokinase

194. Fatty acids cannot be converted into carbohydrates in the body as the following reaction is not possible.

(A) Conversion of glucose-6-phosphate into glucose
(B) Fructose 1, 6-bisphosphate to fructose-6-phosphate
(C) Transformation of acetyl CoA to pyruvate
(D) Formation of acetyl CoA from fatty acids

195. Tissues form lactic acid from glucose. This phenomenon is termed as

(A) Aerobic glycolysis
(B) Oxidation
(C) Oxidative phosphorylation
(D) Anaerobic glycolysis

196. One molecule of glucose gives _____ molecules of CO_2 in EM-TCA cycle.

(A) 6 (B) 3
(C) 1 (D) 2

197. One molecule of glucose gives _____ molecules of CO_2 in one round of HMP shunt.

(A) 6 (B) 1
(C) 2 (D) 3

198. The 4 rate limiting enzymes of gluconeogenesis are

(A) Glucokinase, Pyruvate carboxylae phosphoenol pyruvate carboxykinase and glucose-6-phosphatase
(B) Pyruvate carboxylase, phosphoenol pyruvate carboxykinase, fructose1,6 diphosphatase and glucose-6-phosphatase
(C) Pyruvate kinase, pyruvate carboxylase, phosphoenol pyruvate carboxykinase and glucose-6-phosphatase
(D) Phospho fructokinase, pyruvate carboxylase, phosphoenol pyruvate carboxykinase and fructose 1, 6 diphosphatase

199. For glycogenesis, Glucose should be converted to

(A) Glucuronic acid (B) Pyruvic acid
(C) UDP glucose (D) Sorbitol

200. Fluoride inhibits _____ and arrests glycolysis.

(A) Glyceraldehyde-3-phosphate dehydrogenase
(B) Aconitase
(C) Enolose
(D) Succinate dehydrogenase

201. One of the following statement is correct:

(A) Glycogen synthase 'a' is the phosphorylated
(B) cAMP converts glycogen synthase b to 'a'
(C) Insulin converts glycogen synthase b to a
(D) UDP glucose molecules interact and grow into a Glycogen tree

202. Amylo 1, 6 glucosidase is called

(A) Branching enzyme
(B) debranching enzyme
(C) Glucantransferase
(D) Phosphorylase

203. Glucose enters the cells by

(A) insulin independent transport
(B) insulin dependent transport
(C) enzyme mediated transport
(D) Both (A) and (B)

204. Glycogen while being acted upon by active phosphorylase is converted first to

(A) Glucose
(B) Glucose 1-phosphate and Glycogen with 1 carbon less
(C) Glucose-6-phosphate and Glycogen with 1 carbon less
(D) 6-Phosphogluconic acid

205. When O_2 supply is inadequate, pyruvate is converted to

(A) Phosphopyruvate (B) Acetyl CoA
(C) Lactate (D) Alanine

206. Reactivation of inactive liver phosphorylase is normally favoured by

(A) Insulin (B) Epinephrine
(C) ACTH (D) Glucagon

207. Before pyruvic acid enters the TCA cycle it must be converted to

(A) Acetyl CoA (B) Lactate
(C) α-ketoglutarate (D) Citrate

208. The hydrolysis of Glucose-6-phosphate is catalysed by a specific phosphatase which is found only in

(A) Liver, intestines and kidneys
(B) Brain, spleen and adrenals
(C) Striated muscle
(D) Plasma

209. The formation of citrate from oxalo acetate and acetyl CoA is

(A) Oxidation (B) Reduction
(C) Condensation (D) Hydrolysis

210. Which one of the following is a rate limiting enzyme of gluconeogenesis?

(A) Hexokinase
(B) Phsophofructokinase
(C) Pyruvate carboxylase
(D) Pyruvate kinase

211. The number of ATP produced in the succinate dehydrogenase step is

(A) 1 (B) 2
(C) 3 (D) 4

212. Which of the following reaction gives lactose?

(A) UDP galactose and glucose
(B) UDP glucose and galactose
(C) Glucose and Galactose
(D) Glucose, Galactose and UTP

213. UDP Glucuronic acid is required for the biosynthesis of

(A) Chondroitin sulphates
(B) Glycogen
(C) Lactose
(D) Starch

214. Which one of the following can covert glucose to vitamin C?

(A) Albino rats (B) Humans
(C) Monkeys (D) Guinea pigs

215. Which one of the following cannot convert glucose to Vitamin C?

(A) Albino rats (B) Dogs
(C) Monkeys (D) Cows

216. Transketolase has the coenzyme:

(A) NAD^+ (B) FP
(C) TPP (D) Pyridoxol phosphate

217. Two conditions in which gluconeogenesis is increased are

(A) Diabetes mellitus and atherosclerosis
(B) Fed condition and thyrotoxicosis
(C) Diabetes mellitus and Starvation
(D) Alcohol intake and cigarette smoking

218. Acetyl CoA is not used for the synthesis of

(A) Fatty acid (B) Cholesterol
(C) Pyruvic acid (D) Citric acid

219. The total glycogen content of the body is about _____ gms.

(A) 100 (B) 200
(C) 300 (D) 500

220. The total Glucose in the body is _____ gms.

(A) 10–15 (B) 20–30
(C) 40–50 (D) 60–80

221. Pyruvate kinase requires _____ ions for maximum activity.

(A) Na^+ (B) K^+
(C) $Ca2^+$ (D) $Mg2^+$

222. ATP is 'wasted' in Rapoport-Lueberring cycle in RBCs as otherwise it will inhibit

(A) Phosphoglucomutase
(B) Phosphohexo isomerase
(C) Phosphofructo kinase
(D) Phosphoenol pyruvate carboxy kinase

223. The following co-enzyme is needed for the oxidative decarboxylation of ketoacids:

(A) $NADP^+$ (B) TPP
(C) Folate coenzyme (D) Biotin coenzyme

224. Synthesis of Glucose from amino acids is termed as

(A) Glycolysis (B) Gluconeogenesis
(C) Glycogenesis (D) Lipogenesis

225. The following examples are important heteropolysaccharides except

(A) Amylopectin (B) Heparin
(C) Peptidoglycan (D) Hyaluronic acid

226. Whcih of the following features are common to monosaccharides?

(A) Contain asymmetric centres
(B) Are of 2 types – aldoses and ketoses
(C) Tend to exist as ring structures in solution
(D) Include glucose, galactose and raffinose

227. Polysaccharides

(A) Contain many monosaccharide units which may or may not be of the same kind
(B) Function mainly a storage or structural compounds
(C) Are present in large amounts in connective tissue
(D) All of these

228. The absorption of glucose in the digestive tract

(A) Occurs in the small intestine
(B) Is stimulated by the hormone Glucagon
(C) Occurs more rapidly than the absorption of any other sugar
(D) Is impaired in cases of diabetes mellitus

229. UDP-Glucose is converted to UDP-Glucuronic acid by

(A) ATP (B) GTP
(C) $NADP^+$ (D) NAD^+

230. The enzymes involved in Phosphorylation of glucose to glucose 6- phosphate are

(A) Hexokinase
(B) Glucokinase
(C) Phosphofructokinase
(D) Both (A) and (B)

231. In conversion of Lactic acid to Glucose, three reactions of Glycolytic pathway are circumvented, which of the following enzymes do not participate?

(A) Pyruvate Carboxylase
(B) Phosphoenol pyruvate carboxy kinase
(C) Pyruvate kinase
(D) Glucose-6-phosphatase

232. The normal resting state of humans, most of the blood glucose burnt as "fuel" is consumed by

(A) Liver (B) Brain
(C) Kidneys (D) Adipose tissue

233. A regulator of the enzyme Glycogen synthase is

(A) Citric acid
(B) 2, 3 bisphosphoglycerate
(C) Pyruvate
(D) GTP

234. Which of the following compound is a positive allosteric modifier of the enzyme pyruvate carboxylase?

(A) Biotin (B) Acetyl CoA
(C) Oxaloacetate (D) ATP

235. A specific inhibitor for succinate dehydrogenase is

(A) Arsinite (B) Melouate
(C) Citrate (D) Cyanide

236. Most of the metabolic pathways are either anabolic or catabolic. Which of the following pathways is considered as "amphibolic" in nature?

(A) Glycogenesis (B) Glycolytic pathway
(C) Lipolysis (D) TCA cycle

237. Transketolase activity is affected in

(A) Biotin deficiency
(B) Pyridoxine deficiency
(C) PABA deficiency
(D) Thiamine deficiency

238. The following metabolic abnormalities occur in Diabetes mellitus except

(A) Increased plasma FFA
(B) Increased pyruvate carboxylase activate
(C) Decreased lipogenesis
(D) Decreased gluconeogenesis

239. A substance that is not an intermediate in the formation of D-glucuronic acid from glucose is

(A) Glucoss-1-p
(B) 6-Phosphogluconate
(C) Glucose-6-p
(D) UDP-Glucose

240. The hydrolysis of Glucose-6-P is catalysed by a phosphatase that is not formed in which of the following?

(A) Liver (B) Kidney
(C) Muscle (D) Small intestine

241. An essential for converting Glucose to Glycogen in Liver is

(A) Lactic acid (B) GTP
(C) CTP (D) UTP

242. Which of the following is a substrate for aldolase activity in Glycolytic pathway?

(A) Glyceraldehyde-3-p
(B) Glucose-6-p
(C) Fructose-6-p
(D) Fructose1, 6-bisphosphate

243. The ratio that approximates the number of net molecule of ATP formed per mole of Glucose oxidized in presence of O_2 to the net number formed in abscence of O_2 is

(A) 4 : 1 (B) 10 : 2
(C) 12 : 1 (D) 18 : 1

244. The "Primaquin sensitivity types of haemolytic anaemia has been found to relate to reduced R.B.C activity of which enzyme?

(A) Pyruvate kinase deficiency
(B) Glucose-6-phosphatase deficiency
(C) Glucose-6-p dehydrogenase deficiency
(D) Hexokinase deficiency

245. Which of the following hormones is not involved in carbohydrate metabolism?

(A) Cortisol (B) ACTH
(C) Glucogen (D) Vasopressin

246. Dehydrogenases involved in HMP shunt are specific for

(A) $NADP^+$ (B) NAD^+
(C) FAD (D) FMN

247. Which of the following enzymes in Glycolytic pathway is inhibited by fluoride?

(A) Glyceraldehyde-3-p dehydrogenase
(B) Phosphoglycerate kinase
(C) Pyruvate kinase
(D) Enolase

248. Out of 24 mols of ATP formed in TCA cycle, 2 molecules of ATP can be formed at "substrate level" by which of the following reaction ?

(A) Citric acid→ Isocitric acid
(B) Isocitrate→ Oxaloacetate
(C) Succinic acid→ Fumarate
(D) Succinylcat→ Succinic acid

249. Which of the following statements regarding T.C.A cycle is true?

(A) It is an anaerobic process
(B) It occurs in cytosol
(C) It contains no intermediates for Gluconeogenesis
(D) It is amphibolic in nature

250. An allosteric enzyme responsible for controlling the rate of T.C.A cycle is

(A) Malate dehydrogenase
(B) Isocitrate dehydrogenase
(C) Fumarase
(D) Aconitase

251. The glycolysis is regulated by

(A) Hexokinase (B) Phosphofructokinase
(C) Pyruvate kinase (D) All of these

252. How many ATP molecules will be required for conversion of 2-molecules of Lactic acid to Glucose?

(A) 2 (B) 4
(C) 8 (D) 6

253. Which of the following enzyme is not involved in HMP shunt?

(A) Glyceraldehyde-3-p dehydrogenase
(B) Glucose-6-p-dehydrogenase
(C) Transketolase
(D) Phosphogluconate dehydrogenase

254. In presence of the following cofactor, pyruvate carboxylase converts pyruvate to oxaloacetate:

(A) ATP, Protein and CO_2
(B) CO_2 and ATP
(C) CO_2
(D) Protein

255. For conversion of oxaloacetate to phosphoenol pyruvate, high energy molecule is required in the form of

(A) GTP only (B) ITP only
(C) GTP (or) ITP (D) None of these

256. If the more negative standard reduction potential of a redox pair, the greater the tendency to

(A) To lose electrons
(B) To gain electrons
(C) To lose/gain electrons
(D) To lose and gain electrons

257. Electron transport and phosphorylation can be uncoupled by compounds that increase the permeability of the inner mitochondrial membrane to

(A) Electrons (B) Protons
(C) Uncouplers (D) All of these

258. The more positive the E_0, the greater the tendency of the oxidant member of that pair to

(A) Lose electrons
(B) Gain electrons
(C) Lose (or) gain electrons
(D) Lose and gain electrons

259. The standard free energy of hydrolysis of terminal phosphate group of ATP is

(A) –7,300 cal/mol (B) –8,300 cal/mol
(C) 10,000 cal/mol (D) +7,300 cal/mol

260. The transport of a pair of electrons from NADH to O_2 via the electron transport chain produces

(A) –52,580 cal (B) –50,580 cal
(C) 21,900 cal (D) +52,580 cal

261. Sufficient energy required to produce 3 ATP from 3 ADP and 3 pi is

(A) –21,900 cal (B) 29,900 cal
(C) 31,900 cal (D) 39,900 cal

262. The free energy change, AG

(A) Is directly proportional to the standard free energy change, AG
(B) Is equal to zero at equilibrium
(C) Can only be calculated when the reactants and products are present at 1mol/1 concentrations
(D) Is equal to –RT in keq

263. Under standard conditions

(A) The free energy change $\Delta G°$, is equal to 0
(B) The standard free energy change ΔG, is equal to 0
(C) The free energy change, $\Delta G°$, is equal to the standard free energy change, $\Delta G°$
(D) Keq is equal to 1

264. An uncoupler of oxidative phosphorylation such as dinitrophenol

(A) Inhibits electron transport and ATP synthesis
(B) Allow electron transport to proceed without ATP synthesis
(C) Inhibits electron transport without impairment of ATP synthesis
(D) Specially inhibits cytochrome b

265. All of the following statements about the enzymic complex that carries out the synthesis of ATP during oxidative phosphorylation are correct except

(A) It is located on the matrix side of the inner mitochondrial membrane
(B) It is inhibited by oligomycin
(C) It can exhibit ATPase activity
(D) It can bind molecular O_2

266. Glucokinase

(A) Is widely distributed and occurs in most mammalian tissues
(B) Has a high k_m for glucose and hence is important in the phosphorylation of glucose primarily after ingestion of a carbohydrate rich meal
(C) Is widely distributed in Prokaryotes
(D) None of these

267. The reaction catalysed by phosphofructokinase

(A) Is activated by high concentrations of ATP and citrate
(B) Uses fruitose-1-phosphate as substrate
(C) Is the rate-limiting reaction of the glycolytic pathway
(D) Is inhibited by fructose 2, 6-bisphosphate

268. Compared to the resting state, vigorously contracting muscle shows

(A) An increased conversion of pyruvate to lactate
(B) Decreased oxidation of pyruvate of CO_2 and water
(C) A decreased NADH/NAD^+ ratio
(D) Decreased concentration of AMP

269. Which one of the following would be expected in pyruvate kinase deficiency?

(A) Increased levels of lactate in the R.B.C
(B) Hemolytic anemia
(C) Decreased ratio of ADP to ATP in R.B.C
(D) Increased phosphorylation of Glucose to Glucose-6-phosphate

270. Which one of the following statements concerning glucose metabolism is correct?

(A) The conversion of Glucose to lactate occurs only in the R.B.C
(B) Glucose enters most cells by a mechanism in which Na^+ and glucose are co-transported
(C) Pyruvate kinase catalyses an irreversible reaction
(D) An elevated level of insulin leads to a decreased level of fructose 2, 6-bisphosphate in hepatocyte

271. Which one of the following compounds cannot give rise to the net synthesis of Glucose?

(A) Lactate (B) Glycerol
(C) α-ketoglutarate (D) Acetyl CoA

272. Which of the following reactions is unique to gluconeogenesis?

(A) Lactate Pyruvate
(B) Phosphoenol pyruvate pyruvate
(C) Oxaloacetate phosphoenol pyruvate
(D) Glucose-6-phosphate Fructose-6-phosphate

273. The synthesis of glucose from pyruvate by gluconeogenesis

(A) Requires the participation of biotin
(B) Occurs exclusively in the cytosol
(C) Is inhibited by elevated level of insulin
(D) Requires oxidation/reduction of FAD

274. The conversion of pyruvate to acetyl CoA and CO_2

(A) Is reversible
(B) Involves the participation of lipoic acid
(C) Depends on the coenzyme biotin
(D) Occurs in the cytosol

275. Pasteur effect is

(A) Inhibition of glycolysis
(B) Oxygen is involved
(C) Inhibition of enzyme phosphofructokinase
(D) All of these

276. How many ATPs are produced in the conversion of phosphoenol pyruvate to citrate?

(A) 1 (B) 2
(C) 4 (D) 6

277. Reduced glutathione functions in R.B.Cs to

(A) Produce NADPH
(B) Reduce methemoglobin to hemoglobin
(C) Produce NADH
(D) Reduce oxidizing agents such as H_2O_2

278. Phenylalanine is the precursor of

(A) L-DOPA (B) Histamine
(C) Tyrosine (D) Throxine

279. D-Mannose is present in some plant products like

(A) Resins (B) Pectins
(C) Mucilage (D) Gums

280. Galactose is a main constituent of

(A) Milk sugar (B) Honey
(C) Cane sugar (D) Chitin

281. Glucosamine is an important constituent of

(A) Homopolysaccharide
(B) Heteropolysaccharide
(C) Mucopolysaccharide
(D) Dextran

282. Glycogen is present in all body tissues except

(A) Liver (B) Brain
(C) Kidney (D) Stomach

283. Iodine test is positive for starch, dextrin and

(A) Mucoproteins (B) Agar
(C) Glycogen (D) Cellulose

284. The general formula for polysaccharide is

(A) $(C_6H_{10}O_5)_n$ (B) $(C_6H_{12}C_6)_n$
(C) $(C_6H_{12}O_5)_n$ (D) $(C_5H_{10}O_5)_n$

285. Epimers of glucose is

(A) Fructose (B) Galactose
(C) Ribose (D) Deoxyribose

286. Human heart muscle contains

(A) D-Arabinose (B) D-Ribose
(C) D-Xylose (D) L-Xylose

287. The intermediate n hexose monophosphate shunt is

(A) D-Ribulose (B) D-Arabinose
(C) D-xylose (D) D-Lyxose

288. On boiling Benedict's solution is not reduced by

(A) Sucrose (B) Lactose
(C) Maltose (D) Fructose

289. The distinguishing test between monosaccharides and dissaccharide is

(A) Bial's test (B) Seliwanoff's test
(C) Barfoed's test (D) Hydrolysis test

290. Barfoed's solution is not reduced by

(A) Glucose (B) Mannose
(C) Sucrose (D) Ribose

291. Cori cycle is

(A) Synthesis of glucose
(B) reuse of glucose
(C) uptake of glycose
(D) Both (A) & (B)

292. Cane sugar is known as

(A) Galactose (B) Sucrose
(C) Fructose (D) Maltose

293. Which of the following is not reducing sugar?

(A) Lactose (B) Maltose
(C) Sucrose (D) Fructose

294. α–D-Glucose and β–D-glucose are related by

(A) Epimers (B) Anomers
(C) Multirotation (D) Ketoenol pair

295. The stable ring formation in D-Glucose involves

(A) C-1 and C-4 (B) C-1 and C-2
(C) C-1 and C-5 (D) C-2 and C-5

296. Reduction of Glucose with Ca^{++} in water produces

(A) Sorbitol (B) Dulcitol
(C) Mannitol (D) Glucuronic acid

297. Starch and glycogen are polymers of

(A) Fructose (B) Mannose
(C) α–D-Glucose (D) Galactose

298. Reducing ability of carbohydrates is due to

(A) Carboxyl group (B) Hydroxyl group
(C) Enediol formation (D) Ring structure

299. Which of the following is not a polymer of glucose?

(A) Amylose (B) Inulin
(C) Cellulose (D) Dextrin

300. Invert sugar is

(A) Lactose
(B) Mannose
(C) Fructose
(D) Hydrolytic product of sucrose

301 The carbohydrate reserved in human body is

(A) Starch (B) Glucose
(C) Glycogen (D) Inulin

302 A dissaccharide linked by α-1-4 Glycosideic linkages is

(A) Lactose (B) Sucrose
(C) Cellulose (D) Maltose

ANSWERS

1. A	2. A	3. A	4. A	5. B	6. A
7. A	8. D	9. A	10. A	11. A	12. C
13. B	14. A	15. A	16. B	17. A	18. A
19. C	20. C	21. A	22. D	23. C	24. B
25. A	26. D	27. C	28. C	29. B	30. B
31. D	32. A	33. C	34. B	35. B	36. B
37. C	38. B	39. D	40. A	41. D	42. B
43. A	44. B	45. A	46. A	47. A	48. A
49. B	50. C	51. C	52. A	53. A	54. A
55. B	56. A	57. D	58. A	59. C	60. D
61. C	62. C	63. B	64. C	65. C	66. C
67. B	68. C	69. D	70. D	71. A	72. A
73. B	74. B	75. B	76. B	77. A	78. C
79. A	80. B	81. D	82. C	83. D	84. D
85. B	86. D	87. D	88. C	89. B	90. A
91. A	92. D	93. A	94. C	95. C	96. D
97. D	98. A	99. C	100. C	101. B	102. A
103. C	104. C	105. B	106. B	107. C	108. D
109. B	110. C	111. B	112. B	113. B	114. D
115. B	116. B	117. A	118. B	119. B	120. A
121. B	122. D	123. B	124. A	125. C	126. A
127. B	128. D	129. C	130. A	131. A	132. D
133. C	134. B	135. C	136. C	137. C	138. A
139. B	140. C	141. B	142. A	143. C	144. D
145. B	146. C	147. B	148. B	149. B	150. D
151. B	152. C	153. D	154. A	155. B	156. A
157. C	158. A	159. B	160. D	161. A	162. B
163. A	164. B	165. D	166. C	167. C	168. A
169. B	170. A	171. D	172. C	173. A	174. B
175. D	176. B	177. A	178. C	179. D	180. B
181. B	182. C	183. D	184. B	185. C	186. C
187. A	188. B	189. C	190. B	191. A	192. D
193. D	194. C	195. D	196. A	197. B	198. B
199. C	200. C	201. C	202. B	203. D	204. C
205. C	206. D	207. A	208. A	209. C	210. C
211. B	212. A	213. A	214. A	215. C	216. C
217. C	218. C	219. C	220. B	221. B	222.C
223. B	224. B	225. A	226. C	227. D	228. A
229. B	230. D	231. C	232. B	233. C	234. A
235. B	236. D	237. B	238. B	239. B	240. C
241. D	242. D	243. B	244. C	245. D	246. A
247. D	248. D	249. D	250. B	251. D	252. D

253. A	254. A	255. C	256. A	257. B	258. B
259. A	260. D	261. A	262. B	263. C	264. B
265. D	266. B	267. C	268. A	269. B	270. C
271. B	272. C	273. A	274. B	275. D	276. C
277. D	278. C	279. D	280. A	281. C	282. B
283. C	284. A	285. B	286. C	287. A	288. A
289. C	290. C	291. D	292. B	293. C	294. B
295. C	296. A	297. C	298. A	299. B	300. D
301. C	302. D				

EXPLANATIONS FOR THE ANSWERS

7. A Polysaccharides are polymers of monosaccharides. They are of two types– hompolysaccharides that contain a single type of monosaccharide (*e.g.*, starch, insulin, cellulose) and heteropolysaccharides with two or more different types of monosaccharides (*e.g.*, heparin, chondroitin sulfate).

30. B Mutorotation refers to the change in the specific optical rotation representing the interconversion of α- and β- anomers of D-glucose to an equilibrium.

48. A Starch is a polysaccharide composed of D-glucose units held together by α-glycosidic bonds, (α 1$\rightarrow$ 4 linkages; at branching points α 1$\rightarrow$ 6 linkages).

71. A Hyaluronic acid is the ground substance of synovial fluid of joints. It serves as lubricants and shock absorbant in joints.

93. A The process of shifting a hydrogen atom from one carbon to another to produce enediols is referred to as tautomerization.

117. A Mucopolysaccharides (commonly known as glycosaminoglycans) are heteropolysaccharides composed of sugar derivatives (mainly amino sugars and uronic acids). The important mucopolysaccharides include hyaluronic acid, heparin, chondroitin sulfate, dermatan sulfate and keratan sulfate.

141. B *Molisch test:* It is a general test for the detection of carbohydrates. The strong H_2SO_4 hydrolyses carbohydrates (poly- and disaccharides) to liberate monosaccharides. The monosaccharides get dehydrated to form furfural (from pentoses) or hydroxy methylfurfural (from hexoses) which condense with α-naphthol to form a violet coloured complex.

163. A *Seliwanoff's test:* this is a specific test for ketohexoses. Concentrated hydrochloric acid dehydrates ketohexoses to form furfural derivatives which condense with resorcinol to give a cherry red complex.

187. A *Rothera's test:* Nitroprosside in alkaline medium reacts with keto group of ketone bodies (acetone and acetoacetate) to form a purple ring. This test is not given by β-hydroxybutyrate.

203. D Two specific transport systems are recognized for the entry of glucose into the cells.

(a) *Insulin-independent transport:* This is a carrier mediated uptake of glucose which is not dependent on the hormone inslulin. This operates in hepatocytes, erythrocytes and brain.

(b) *Insulin-dependent transport:* This occurs in muscle and adipose tissue.

230. D Hexokinase and glucokinase are involved in the phosphorylation of glucose to glucose 6-phosphate. The enzyme hexokinase, present in almost all the tissues, catalyses the phosphorylation of other hexose also (fructose, mannose). It has low K_m for substrates (about 0.1 mM) and is inhibited by glucose 6-phosphate. In contrast, glucokinase is present in liver, catalyses the phosphorylation of only glucose, has high K_m for glucose (10 mM)

and is not inhibited by glucose 6-phosphate.

251. D The three enzymes namely hexokinase (or glucokinase), phosphofructokinase and pyruvate kinase, catalyzing the irreversible reactions regulate glycolysis. Among these, phosphofructokinase is the most regulatory. It is an allosteric enzyme inhibited by ATP, citrate and activated by AMP and Pi.

275. D The inhibition of glycolysis by oxygen is referred to as Pasteur effect. This is due to inhibition of the enzyme phosphofructokinase by ATP and citrate (formed in the presence of O_2)

291. D The cycle involving the synthesis of glucose in liver from the skeletal muscle lactate and the reuse of glucose thus synthesized by the muscle for energy purposes is known as Cori Cycle.

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CHAPTER 3

PROTEINS AND PROTEIN METABOLISM

1. All proteins contain the

(A) Same 20 amino acids
(B) Different amino acids
(C) 300 Amino acids occurring in nature
(D) Only a few amino acids

2. Proteins contain

(A) Only L- α - amino acids
(B) Only D-amino acids
(C) DL-Amino acids
(D) Both (A) and (B)

3. The optically inactive amino acid is

(A) Glycine (B) Serine
(C) Threonine (D) Valine

4. At neutral pH, a mixture of amino acids in solution would be predominantly:

(A) Dipolar ions
(B) Nonpolar molecules
(C) Positive and monovalent
(D) Hydrophobic

5. The true statement about solutions of amino acids at physiological pH is

(A) All amino acids contain both positive and negative charges
(B) All amino acids contain positively charged side chains
(C) Some amino acids contain only positive charge
(D) All amino acids contain negatively charged side chains

6. pH (isoelectric pH) of alanine is

(A) 6.02 (B) 6.6
(C) 6.8 (D) 7.2

7. Since the pK values for aspartic acid are 2.0, 3.9 and 10.0, it follows that the isoelectric (pH) is

(A) 3.0 (B) 3.9
(C) 5.9 (D) 6.0

8. Sulphur containing amino acid is

(A) Methionine (B) Leucine
(C) Valine (D) Asparagine

9. An example of sulphur containing amino acid is

(A) 2-Amino-3-mercaptopropanoic acid
(B) 2-Amino-3-methylbutanoic acid
(C) 2-Amino-3-hydroxypropanoic acid
(D) Amino acetic acid

10. All the following are sulphur containing amino acids found in proteins except

(A) Cysteine (B) Cystine
(C) Methionine (D) Threonine

11. An aromatic amino acid is

(A) Lysine (B) Tyrosine
(C) Taurine (D) Arginine

12. The functions of plasma albumin are

(A) Osmosis (B) Transport
(C) Immunity (D) both (A)and (B)

13. Amino acid with side chain containing basic groups is

(A) 2-Amino 5-guanidovaleric acid
(B) 2-Pyrrolidine carboxylic acid
(C) 2-Amino 3-mercaptopropanoic acid
(D) 2-Amino propanoic acid

14. An example of α-amino acid not present in proteins but essential in mammalian metabolism is

(A) 3-Amino 3-hydroxypropanoic acid
(B) 2-Amino 3-hydroxybutanoic acid
(C) 2-Amino 4-mercaptobutanoic acid
(D) 2-Amino 3-mercaptopropanoic acid

15. An essential amino acid in man is

(A) Aspartate (B) Tyrosine
(C) Methionine (D) Serine

16. Non essential amino acids

(A) Are not components of tissue proteins
(B) May be synthesized in the body from essential amino acids
(C) Have no role in the metabolism
(D) May be synthesized in the body in diseased states

17. Which one of the following is semi-essential amino acid for humans?

(A) Valine (B) Arginine
(C) Lysine (D) Tyrosine

18. An example of polar amino acid is

(A) Alanine (B) Leucine
(C) Arginine (D) Valine

19. The amino acid with a nonpolar side chain is

(A) Serine (B) Valine
(C) Asparagine (D) Threonine

20. A ketogenic amino acid is

(A) Valine (B) Cysteine
(C) Leucine (D) Threonine

21. An amino acid that does not form an α-helix is

(A) Valine (B) Proline
(C) Tyrosine (D) Tryptophan

22. An amino acid not found in proteins is

(A) β-Alanine (B) Proline
(C) Lysine (D) Histidine

23. In mammalian tissues serine can be a biosynthetic precursor of

(A) Methionine (B) Glycine
(C) Tryptophan (D) Phenylalanine

24. A vasodilating compound is produced by the decarboxylation of the amino acid:

(A) Arginine (B) Aspartic acid
(C) Glutamine (D) Histidine

25. Biuret reaction is specific for

(A) –CONH-linkages (B) $-CSNH_2$ group
(C) $-(NH)NH_2$ group (D) All of these

26. Sakaguchi's reaction is specific for

(A) Tyrosine (B) Proline
(C) Arginine (D) Cysteine

27. Million-Nasse's reaction is specific for the amino acid:

(A) Tryptophan (B) Tyrosine
(C) Phenylalanine (D) Arginine

28. Ninhydrin with evolution of CO_2 forms a blue complex with

(A) Peptide bond (B) α-Amino acids
(C) Serotonin (D) Histamine

29. The most of the ultraviolet absorption of proteins above 240 nm is due to their content of

(A) Tryptophan (B) Aspartate
(C) Glutamate (D) Alanine

30. Which of the following is a dipeptide?

(A) Anserine (B) Glutathione
(C) Glucagon (D) β-Lipoprotein

31. Which of the following is a tripeptide?

(A) Anserine (B) Oxytocin
(C) Glutathione (D) Kallidin

32. A peptide which acts as potent smooth muscle hypotensive agent is

(A) Glutathione (B) Bradykinin
(C) Tryocidine (D) Gramicidin-s

33. A tripeptide functioning as an important reducing agent in the tissues is

(A) Bradykinin (B) Kallidin
(C) Tyrocidin (D) Glutathione

34. An example of metalloprotein is

(A) Casein (B) Ceruloplasmin
(C) Gelatin (D) Salmine

35. Carbonic anhydrase is an example of

(A) Lipoprotein (B) Phosphoprotein
(C) Metalloprotein (D) Chromoprotein

36. An example of chromoprotein is

(A) Hemoglobin (B) Sturine
(C) Nuclein (D) Gliadin

37. An example of scleroprotein is

(A) Zein (B) Keratin
(C) Glutenin (D) Ovoglobulin

38. Casein, the milk protein is

(A) Nucleoprotein (B) Chromoprotein
(C) Phosphoprotein (D) Glycoprotein

39. An example of phosphoprotein present in egg yolk is

(A) Ovoalbumin (B) Ovoglobulin
(C) Ovovitellin (D) Avidin

40. A simple protein found in the nucleoproteins of the sperm is

(A) Prolamine (B) Protamine
(C) Glutelin (D) Globulin

41. Histones are

(A) Identical to protamine
(B) Proteins rich in lysine and arginine
(C) Proteins with high molecular weight
(D) Insoluble in water and very dilute acids

42. The protein present in hair is

(A) Keratin (B) Elastin
(C) Myosin (D) Tropocollagen

43. The amino acid from which synthesis of the protein of hair keratin takes place is

(A) Alanine (B) Methionine
(C) Proline (D) Hydroxyproline

44. In one molecule of albumin the number of amino acids is

(A) 510 (B) 590
(C) 610 (D) 650

45. Plasma proteins which contain more than 4% hexosamine are

(A) Microglobulins (B) Glycoproteins
(C) Mucoproteins (D) Orosomucoids

46. After releasing O_2 at the tissues, hemoglobin transports

(A) CO_2 and protons to the lungs
(B) O_2 to the lungs
(C) CO_2 and protons to the tissue
(D) Nutrients

47. Ehlers-Danlos syndrome characterized by hypermobile joints and skin abnormalities is due to

(A) Abnormality in gene for procollagen
(B) Deficiency of lysyl oxidase
(C) Deficiency of prolyl hydroxylase
(D) Deficiency of lysyl hydroxylase

48. Proteins are soluble in

(A) Anhydrous acetone (B) Aqueous alcohol
(C) Anhydrous alcohol (D) Benzene

49. A cereal protein soluble in 70% alcohol but insoluble in water or salt solution is

(A) Glutelin (B) Protamine
(C) Albumin (D) Gliadin

50. Many globular proteins are stable in solution inspite they lack in

(A) Disulphide bonds (B) Hydrogen bonds
(C) Salt bonds (D) Non polar bonds

51. The hydrogen bonds between peptide linkages of a protein molecules are interfered by

(A) Guanidine (B) Uric acid
(C) Oxalic acid (D) Salicylic acid

52. Globular proteins have completely folded, coiled polypeptide chain and the axial ratio (ratio of length to breadth) is

(A) Less than 10 and generally not greater than 3–4
(B) Generally 10
(C) Greater than 10 and generally 20
(D) Greater than 10

53. Fibrous proteins have axial ratio

(A) Less than 10
(B) Less than 10 and generally not greater than 3–4
(C) Generally 10
(D) Greater than 10

54. Each turn of α-helix contains the amino acid residues (number):

(A) 3.6 (B) 3.0
(C) 4.2 (D) 4.5

55. Distance traveled per turn of α–helix in nm is

(A) 0.53 (B) 0.54
(C) 0.44 (D) 0.48

56. Along the α-helix each amino acid residue advances in nm by

(A) 0.15 (B) 0.10
(C) 0.12 (D) 0.20

57. The number of helices present in a collagen molecule is

(A) 1 (B) 2
(C) 3 (D) 4

58. In proteins the α-helix and β-pleated sheet are examples of

(A) Primary structure (B) Secondary structure
(C) Tertiary structure (D) Quaternary structure

59. The a-helix of proteins is

(A) A pleated structure
(B) Made periodic by disulphide bridges
(C) A non-periodic structure
(D) Stabilised by hydrogen bonds between NH and CO groups of the main chain

60. At the lowest energy level α-helix of polypeptide chain is stabilised

(A) By hydrogen bonds formed between the H of peptide N and the carbonyl O of the residue
(B) Disulphide bonds
(C) Non polar bonds
(D) Ester bonds

61. Both α-helix and β-pleated sheet conformation of proteins were proposed by

(A) Watson and Crick
(B) Pauling and Corey
(C) Waugh and King
(D) Y.S.Rao

62. The primary structure of fibroin, the principal protein of silk worm fibres consists almost entirely of

(A) Glycine (B) Aspartate
(C) Keratin (D) Tryptophan

63. Tertiary structure of a protein describes

(A) The order of amino acids
(B) Location of disulphide bonds
(C) Loop regions of proteins
(D) The ways of protein folding

64. In a protein molecule the disulphide bond is not broken by

(A) Reduction
(B) Oxidation
(C) Denaturation
(D) X-ray diffraction

65. The technique for purification of proteins that can be made specific for a given protein is

(A) Gel filtration chromotography
(B) Ion exchange chromatography
(C) Electrophoresis
(D) Affinity chromatography

66. Denaturation of proteins results in

(A) Disruption of primary structure
(B) Breakdown of peptide bonds
(C) Destruction of hydrogen bonds
(D) Irreversible changes in the molecule

67. Ceruloplasmin is

(A) α_1-globulin (B) α_2-globulin
(C) β-globulin (D) None of these

68. The lipoprotein with the fastest electrophoretic mobility and the lowest triglyceride content is

(A) Chylomicron (B) VLDL
(C) IDL (D) HDL

69. The lipoprotein associated with activation of LCAT is

(A) HDL (B) LDL
(C) VLDL (D) IDL

70. The apolipoprotein which acts as activator of LCAT is

(A) A-I (B) A-IV
(C) C-II (D) D

71. The apolipoprotein which acts as actiator of extrahepatic lipoprotein is

(A) Apo-A (B) Apo-B
(C) Apo-C (D) Apo-D

72. The apolipoprotein which forms the integral component of chylomicron is

(A) B-100 (B) B-48
(C) C (D) D

73. The apolipoprotein which from the integral component of VLDL is

(A) B-100 (B) B-48
(C) A (D) D

74. The apolipoprotein which acts as ligand for LDL receptor is

(A) B-48 (B) B-100
(C) A (D) C

75. Serum LDL has been found to be increased in

(A) Obstructive jaundice
(B) Hepatic jaundice
(C) Hemolytic jaundice
(D) Malabsorption syndrome

76. A lipoprotein associated with high incidence of coronary atherosclerosis is

(A) LDL (B) VLDL
(C) IDL (D) HDL

77. A lipoprotein inversely related to the incidence of coronary artherosclerosis is

(A) VLDL (B) IDL
(C) LDL (D) HDL

78. The primary biochemical lesion in homozygote with familial hypercholesterolemia (type IIa) is

(A) Loss of feed back inhibition of HMG reductase
(B) Loss of apolipoprotein B
(C) Increased production of LDL from VLDL
(D) Functional deficiency of plasma membrane receptors for LDL

79. In abetalipoproteinemia, the biochemical defect is in

(A) Apo-B synthesis
(B) Lipprotein lipase activity
(C) Cholesterol ester hydrolase
(D) LCAT activity

80. Familial hypertriaacylglycerolemia is associated with

(A) Over production of VLDL
(B) Increased LDL concentration
(C) Increased HDL concentration
(D) Slow clearance of chylomicrons

81. For synthesis of prostaglandins, the essential fatty acids give rise to a fatty acid containing

(A) 12 carbon atoms (B) 16 carbon atoms
(C) 20 carbon atoms (D) 24 carbon atoms

82. All active prostaglandins have at least one double bond between positions

(A) 7 and 8 (B) 10 and 11
(C) 13 and 14 (D) 16 and 17

83. Normal range of plasma total phospholipids is

(A) 0.2–0.6 mmol/L (B) 0.9–2.0 mmol/L
(C) 1.8–5.8 mmol/L (D) 2.8–5.3 mmol/L

84. HDL_2 have the density in the range of

(A) 1.006–1.019 (B) 1.019–1.032
(C) 1.032–1.063 (D) 1.063–1.125

85. β-lipoproteins have the density in the range of

(A) 0.95–1.006 (B) 1.006–1.019
(C) 1.019–1.063 (D) 1.063–1.125

86. IDL have the density in the range of

(A) 0.95–1.006 (B) 1.006–1.019
(C) 1.019–1.032 (D) 1.032–1.163

87. Aspirin inhibits the activity of the enzyme:

(A) Lipoxygenase (B) Cyclooxygenase
(C) Phospholipae A_1 (D) Phospholipase A_2

88. A 'suicide enzyme' is

(A) Cycloxygenase (B) Lipooxygenase
(C) Phospholipase A_1 (D) Phospholipase A_2

89. In adipose tissue prostaglandins decrease

(A) Lipogenesis (B) Lipolysis
(C) Gluconeogenesis (D) Glycogenolysis

90 The optimal pH for the enzyme pepsin is

(A) 1.0–2.0 (B) 4.0–5.0
(C) 5.2-6.0 (D) 5.8–6.2

91. Pepsinogen is converted to active pepsin by

(A) HCl (B) Bile salts
(C) Ca^{++} (D) Enterokinase

92. The optimal pH for the enzyme rennin is

(A) 2.0 (B) 4.0
(C) 8.0 (D) 6.0

93. The optimal pH for the enzyme trypsin is

(A) 1.0–2.0 (B) 2.0–4.0
(C) 5.2–6.2 (D) 5.8–6.2

94. The optimal pH for the enzyme chymotrypsin is

(A) 2.0 (B) 4.0
(C) 6.0 (D) 8.0

95 Trypsinogen is converted to active trypsin by

(A) Enterokinase (B) Bile salts
(C) HCl (D) Mg^{++}

96 Pepsin acts on denatured proteins to produce

(A) Proteoses and peptones
(B) Polypeptides
(C) Peptides
(D) Dipeptides

97. Renin converts casein to paracasein in presence of

(A) Ca^{++} (B) Mg^{++}
(C) Na^{+} (D) K^{+}

98. An expopeptidase is

(A) Trypsin (B) Chymotrypsin
(C) Elastase (D) Elastase

99. The enzyme trypsin is specific for peptide bonds of

(A) Basic amino acids
(B) Acidic amino acids
(C) Aromatic amino acids
(D) Next to small amino acid residues

100. Chymotrypsin is specific for peptide bonds containing

(A) Uncharged amino acid residues
(B) Acidic amino acids
(C) Basic amino acid
(D) Small amino acid residues

101. The end product of protein digestion in G.I.T. is

(A) Dipeptide (B) Tripeptide
(C) Polypeptide (D) Amino acid

102. Natural L-isomers of amino acids are absorbed from intestine by

(A) Passive diffusion (B) Simple diffusion
(C) Faciliated diffusion (D) Active process

103. Abnormalities of blood clotting are

(A) Haemophilia (B) Christmas disease
(C) Gout (D) Both (A) and (B)

104. An important reaction for the synthesis of amino acid from carbohydrate intermediates is transamination which requires the cofactor:

(A) Thiamin (B) Riboflavin
(C) Niacin (D) Pyridoxal phosphate

105. The main sites for oxidative deamination are

(A) Liver and kidney
(B) Skin and pancreas
(C) Intestine and mammary gland
(D) Lung and spleen

106. A positive nitrogen balance occurs

(A) In growing infant
(B) Following surgery
(C) In advanced cancer
(D) In kwashiorkar

107. The main site of urea synthesis in mammals is

(A) Liver (B) Skin
(C) Intestine (D) Kidney

108. The enzymes of urea synthesis are found in

(A) Mitochondria only
(B) Cytosol only
(C) Both mitochondria and cytosol
(D) Nucleus

109. The number of ATP required for urea synthesis is

(A) 0 (B) 1
(C) 2 (D) 3

110. Most of the ammonia released from L-α-amino acids reflects the coupled action of transaminase and

(A) L-glutamate dehydrogenase
(B) L-amino acid oxidase
(C) Histidase
(D) Serine dehydratase

111. In urea synthesis, the amino acid functioning solely as an enzyme activator:

(A) N-acetyl glutamate (B) Ornithine
(C) Citrulline (D) Arginine

112. The enzyme carbamoyl phosphate synthetase requires

(A) Mg^{++} (B) Ca^{++}
(C) Na^{+} (D) K^{+}

113. Control of urea cycle involves the enzyme:

(A) Carbamoyl phosphate synthetase
(B) Ornithine transcarbamoylase
(C) Argininosuccinase
(D) Arginase

114. Transfer of the carbamoyl moiety of carbamoyl phosphate to ornithine is catalysed by a liver mitochondrial enzyme:

(A) Carbamoyl phosphate synthetase
(B) Ornithine transcarbamoylase
(C) N-acetyl glutamate synthetase
(D) N-acetyl glutamate hydrolase

115. A compound serving a link between citric acid cycle and urea cycle is

(A) Malate (B) Citrate
(C) Succinate (D) Fumarate

116. The 2 nitrogen atoms in urea are contributed by

(A) Ammonia and glutamate
(B) Glutamine and glutamate
(C) Ammonia and aspartate
(D) Ammonia and alanine

117. In carcinoid syndrome the argentaffin tissue of the abdominal cavity overproduce

(A) Serotonin (B) Histamine
(C) Tryptamine (D) Tyrosine

118. Tryptophan could be considered as precursor of

(A) Melanotonin (B) Thyroid hormones
(C) Melanin (D) Epinephrine

119. Conversion of tyrosine to dihydroxyphenylalanine is catalysed by tyrosine hydroxylase which requires

(A) NAD (B) FAD
(C) ATP (D) Tetrahydrobiopterin

120. The rate limiting step in the biosynthesis of catecholamines is

(A) Decarboxylation of dihydroxyphenylalanine
(B) Hydroxylation of phenylalanine
(C) Hydroxylation of tyrosine
(D) Oxidation of dopamine

121. The enzyme dopamine β-oxidase which catalyses conversion of dopamine to norepinephrine requires

(A) Vitamin A (B) Vitamin C
(C) Vitamin E (D) Vitamin B_{12}

122. In humans the sulphur of methionine and cysteine is excreted mainly as

(A) Ethereal sulphate
(B) Inorganic sulphate
(C) Sulphites
(D) Thioorganic compound

123. Small amount of urinary oxalates is contributed by the amino acid:

(A) Glycine (B) Tyrosine
(C) Alanine (D) Serine

124. The amino acid which detoxicated benzoic acid to form hippuric acid is

(A) Glycine (B) Alanine
(C) Serine (D) Glutamic acid

125. The amino acids involved in the synthesis of creatin are

(A) Arginine, glycine, active methionine
(B) Arginine, alanine, glycine
(C) Glycine, lysine, methionine
(D) Arginine, lysine, methionine

126. Chemical score of egg proteins is considered to be

(A) 100 (B) 60
(C) 50 (D) 40

127. Chemical score of milk proteins is

(A) 70 (B) 65
(C) 60 (D) 40

128. Chemical score of proteins of bengal gram is

(A) 70 (B) 60
(C) 44 (D) 42

129. Chemical score of protein gelatin is

(A) 0 (B) 44
(C) 57 (D) 60

130 Chemical score of protein zein is

(A) 0 (B) 57
(C) 60 (D) 70

131. Biological value of egg white protein is

(A) 94 (B) 83
(C) 85 (D) 77

132. Net protein utilisation of egg protein is

(A) 75% (B) 80%
(C) 91% (D) 72%

133. Net protein utilization of milk protein is

(A) 75% (B) 80%
(C) 86% (D) 91%

134. A limiting amino acid is an essential amino acid

(A) That is most deficient in proteins
(B) That is most excess in proteins
(C) That which increases the growth
(D) That which increases the weight gain

135. The limiting amino acid of rice is

(A) Lysine (B) Tryptophan
(C) Phenylalanine (D) Tyrosine

136. The limiting amino acid of fish proteins is

(A) Tryptophan (B) Cysteine
(C) Lysine (D) Threonine

137. Pulses are deficient in

(A) Lysine (B) Threonine
(C) Methionine (D) Tryptophan

138. A trace element deficient in the milk is

(A) Magnesium (B) Copper
(C) Zinc (D) Chloride

139. A conjugated protein present in the egg yolk is

(A) Vitellin (B) Livetin
(C) Albuminoids (D) Ovo-mucoid

140. The chief protein of cow's milk is

(A) Albumin (B) Vitellin
(C) Livetin (D) Casein

141. A water soluble vitamin deficient in egg is

(A) Thiamin (B) Ribofalvin
(C) Ascrobic acid (D) Cobalamin

142. Pulses are rich in

(A) Lysine (B) Methionine
(C) Tryptophan (D) Phenylalanine

143. Milk is deficient in

(A) Vitamin B_1 (B) Vitamin B_2
(C) Sodium (D) Potassium

144. Milk is deficient in

(A) Calcium (B) Iron
(C) Sodium (D) Potassium

145. When net protein utilization (NPU) is low, the requirements for proteins are

(A) High (B) Moderate
(C) Low (D) Supplementary

146. Protein content of human milk is about

(A) 1.4% (B) 2.4%
(C) 3.4% (D) 4.4%

147. Protein content of cow's milk is about

(A) 2.5% (B) 3.5%
(C) 4.5% (D) 5.5%

148. Protein content of soyabean is about

(A) 30% (B) 40%
(C) 50% (D) 60%

149. Lipid content of egg white is

(A) 12% (B) 33%
(C) 10–11% (D) Traces

150. The recommended daily allowance (RDA) of proteins for an adult man is

(A) 70 gms (B) 50 gms
(C) 40 gms (D) 30 gms

151. The basic amino acids are

(A) Lysine (B) Bile acids
(C) Glycine (D) Alanine

152. The daily caloric requirement for the normal adult female is about

(A) 1500 (B) 2100
(C) 2500 (D) 2900

153. In the total proteins, the percentage of albumin is about

(A) 20–40 (B) 30–45
(C) 50–70 (D) 80–90

154. In the total proteins percentage of α_1 globulin is about

(A) 0.2–1.2% (B) 1.2–2.0%
(C) 2.4–4.4% (D) 5.0–10.0%

155. In the total proteins the percentage of γ globulin is about

(A) 2.4–4.4% (B) 10.0–21.0%
(C) 6.1–10.1% (D) 1.2–2.0%

156. Most frequently the normal albumin globulin ratioratio (A : G) is

(A) 1.0 : 0.8 (B) 1.5 : 1.0
(C) 2.0 : 1.0 (D) 2.4 : 1.0

157. In Thymol turbidity test the protein involved is mainly

(A) Albumin (B) α_1-Globulin
(C) α_2-Globulin (D) β Globulin

158. In quaternary structure, subunits are linked by

(A) Peptide bonds (B) Disulphide bonds
(C) Covalent bonds (D) Non-covalent bonds

159. Molecular weight of human albumin is about

(A) 156,000 (B) 90,000
(C) 69,000 (D) 54,000

160. At isoelectric pH, an amino acid exists as

(A) Anion (B) Cation
(C) Zwitterion (D) None of these

161. A disulphide bond can be formed between

(A) Two methionine residues
(B) Two cysteine residues
(C) A methionine and a cysteine residue
(D) All of these

162 A coagulated protein is

(A) Insoluble
(B) Biologically non-functional
(C) Unfolded
(D) All of the above

163. At a pH below the isoelectric point, an amino acid exists as

(A) Cation
(B) Anion
(C) Zwitterion
(D) Undissociated molecule

164. An amino acid having a hydrophilic side chain is

(A) Alanine (B) Proline
(C) Methionine (D) Serine

165. An amino acid that does not take part in α helix formation is

(A) Histidine (B) Tyrosine
(C) Proline (D) Tryptophan

166. A protein rich in cysteine is

(A) Collagen (B) Keratin
(C) Haemoglobin (D) Gelatin

167. Primary structure of proteins can be determined by the use of

(A) Electrophoresis (B) Chromatography
(C) Ninhydrin (D) Sanger's reagent

168. Electrostatic bonds can be formed between the side chains of

(A) Alanine and leucine
(B) Leucine and valine
(C) Asparate and glutamate
(D) Lysine and aspartate

169. Sanger's reagent contains

(A) Phenylisothiocyanate
(B) Dansyl chloride
(C) 1-Fluoro-2, 4-dinitrobenzene
(D) Ninhydrin

170. The most abundant protein in mammals is

(A) Albumin (B) Haemoglobin
(C) Collagen (D) Elastin

171. Folding of newly synthesized proteins is accelerated by

(A) Protein disulphide isomerase
(B) Prolyl cis-trans isomerase
(C) Chaperonins
(D) All of these

172. Primary structure of a protein is formed by

(A) Hydrogen bonds (B) Peptide bonds
(C) Disulphide bonds (D) All of these

173. α-Helix is formed by

(A) Hydrogen bonds
(B) Hydrophobic bonds
(C) Electrostatic bonds
(D) Disulphide bonds

174. Glutelins are present in

(A) Milk (B) Eggs
(C) Meat (D) Cereals

175. Aromatic amino acids can be detected by

(A) Sakaguchi reaction
(B) Millon-Nasse reaction
(C) Hopkins-Cole reaction
(D) Xanthoproteic reaction

176. Two amino groups are present in

(A) Leucine (B) Glutamate
(C) Lysine (D) Threonine

177. During denaturation of proteins, all of the following are disrupted except

(A) Primary structure (B) Secondary structure
(C) Tertiary structure (D) Quaternary structure

178. All the following are branched chain amino acids except

(A) Isoleucine (B) Alanine
(C) Leucine (D) Valine

179. An –OH group is present in the side chain of

(A) Serine (B) Arginine
(C) Lysine (D) Proline

180. Edman's reagent contains

(A) Phenylisothiocyanate
(B) 1-Fluoro-2, 4-dinitrobenzene
(C) Dansyl Chloride
(D) tBOC azide

181. Edman's reaction can be used to

(A) Determine the number of tyrosine residues in a protein
(B) Determine the number of aromatic amino acid residues in a protein
(C) Determine the amino acid sequence of a protein
(D) Hydrolyse the peptide bonds in a protein

182. Inherited deficiency of β–glucosidase causes

(A) Tay-Sachs disease
(B) Metachromatic leukodystrophy
(C) Gaucher's disease
(D) Multiple sclerosis

183. Tay-Sachs disease results from inherited deficiency of

(A) Arylsulphatase A
(B) Hexosaminidase A
(C) Sphingomyelinase
(D) Ceramidase

184. The largest alpolipoprotein is

(A) Apo E (B) Apo B-48
(C) Apo B-100 (D) Apo A-I

185. Apolipoprotein B-100 is synthesised in

(A) Adipose tissue (B) Liver
(C) Intestine (D) Liver and intestine

186. Apolipoprotein B-48 is synthesized in

(A) Adipose tissue (B) Liver
(C) Intestine (D) Liver and intestine

187. Apolipoproteins A-I and A-II are present in

(A) LDL only
(B) LDL and VLDL
(C) HDL only
(D) HDL and chylomicrons

188. Apolipoprotein B-48 is present in

(A) Chylomicrons (B) VLDL
(C) LDL (D) HDL

189. Apolipoprotein B-100 is present in

(A) Chylomicrons (B) VLDL only
(C) LDL only (D) VLDL and LDL

190. Apolipoproteins C-I, C-II and C-III are present in

(A) Chylomicrons (B) VLDL
(C) HDL (D) All of these

191. Apolipoprotiens C-I, C-II and C-III are present in all of the following except

(A) Chylomicrons (B) VLDL
(C) LDL (D) HDL

192. Apolipoprotein A-I acts as

(A) Enzyme activator (B) Ligand for receptor
(C) Both (A) and (B) (D) None of these

193. Apolipoprotien B-100 acts as

(A) Enzyme activator (B) Ligand for receptor
(C) Both (A) and (B) (D) None of these

194. Apolipoprotein C-II is an activator of

(A) Lecithin cholesterola acyl transferase
(B) Phospholipase C
(C) Extrahepatic lipoprotein lipase
(D) Hepatic lipoprotein lipase

195. Nascent chylomicron receives apolipoproteins C and E from

(A) VLDL remnant (B) VLDL
(C) LDL (D) HDL

196. Terminal transferase

(A) Removes nucleotides from 3′ end
(B) Adds nucleotides at 3′ end
(C) Removes nucleotides from 3′end
(D) Adds nucleotides at 3′end

197. S1 nuclease hydrolyses

(A) DNA of somatic cells
(B) DNA of sperms
(C) Any double stranded DNA
(D) Any single stranded DNA

198. Positive nitrogen balance is seen in

(A) Starvation
(B) Wasting diseases
(C) Growing age
(D) Intestinal malabsorption

199. Alanine can be synthesized from

(A) Glutamate and α-ketoglutarate
(B) Pyruvate and glutamate
(C) Pyruvate and α-ketoglutarate
(D) Asparate and α-ketoglutarate

200. All of the following are required for synthesis of alanine except

(A) Pyruvate (B) α-ketoglutarate
(C) Glutamate (D) Pyridoxal phosphate

201. All of the following statements about aspartate are true except

(A) It is non-essential amino acid
(B) It is a dicarboxylic amino acid
(C) It can be synthesized from pyruvate and glutamate
(D) It can be converted into asparagine

202. Glycine can be synthesized from

(A) Serine (B) Choline
(C) Betaine (D) All of these

203. All of the following are required for synthesis of glutamine except

(A) Glutamate
(B) Ammonia
(C) Pyridoxal phosphate
(D) ATP

204. A coenzyme required for the synthesis of glycine from serine is

(A) ATP
(B) Pyridoxal phosphate
(C) Tetrahydrofolate
(D) NAD

205. All of the following statements about proline are true except

(A) It is an imino acid
(B) It can be synthesized from glutamate
(C) It can be catabolised to glutamate
(D) Free proline can be hydroxylated to hydroxyproline

206. A protein rich in hydroxyproline is

(A) Prolamin (B) Procollagen
(C) Collagen (D) Proinsulin

207. All the following statement about hydroxyproline are true except

(A) There is no codon for hydroxyproline
(B) It is present in large amounts in collagen
(C) Free proline *cannot* be hydroxylated to hydroxyproline
(D) Hydroxylation of proline residues is catalysed by a dioxygenase

208. All of the following are required for hydroxylation of proline residues except

(A) Ascorbic acid (B) Glutamate
(C) Ferrous ions (D) Molecular oxygen

209. Cysteine can be synthesized from methionine and

(A) Serine (B) Homoserine
(C) Homocysteine (D) Threonine

210. Methionine is synthesized in human body from

(A) Cysteine and homoserine
(B) Homocysteine and serine
(C) Cysteine and serine
(D) None of these

211. Hydroxylation of phenylalanine requires all of the following except

(A) Phenylalanine hydroxylase
(B) Tetrahydrobiopterin
(C) NADH
(D) Molecular oxygen

212. Non-Protein amino acids are

(A) Ornithine
(B) β-alanine
(C) γ-amino butyric acid
(D) All of these

213. The amino acid that undergoes oxidative deamination at significant rate is

(A) Alanine (B) Aspartate
(C) Glutamate (D) Glutamine

214. Allosteric inhibitor of glutamate dehydrogenase is

(A) ATP (B) ADP
(C) AMP (D) GMP

215. Allsoteric activator of glutamate dehydrogenase is

(A) ATP (B) GTP
(C) ADP and GDP (D) AMP and GMP

216. Free ammonia is released during

(A) Oxidative deamination of glutamate
(B) Catabolism of purines
(C) Catabolism of pyrimidines
(D) All of these

217. An organ which is extremely sensitive to ammonia toxicity is

(A) Liver (B) Brain
(C) Kidney (D) Heart

218. Ammonia is transported from muscles to liver mainly in the form of

(A) Free ammonia (B) Glutamine
(C) Asparagine (C) Alanine

219. The major site of urea synthesis is

(A) Brain (B) Kidneys
(C) Liver (D) Muscles

220. Carbamoyl phosphate required for urea synthesis is formed in

(A) Cytosol (B) Mitochondria
(C) Both (A) and (B) (D) None of these

221. Cytosolic and mitochondrial carbamoyl phosphate synthetase have the following similarity:

(A) Both use ammonia as a substance
(B) Both provide carbamoyl phosphate for urea synthesis
(C) Both require N-acetylglutamate as an activator
(D) Both are allosteric enzymes

222. The following enzyme of urea cycle is present in cytosol:

(A) Argininosuccinic acid synthetase
(B) Argininosuccinase
(C) Arginase
(D) All of these

223. ATP is required in following reactions of urea cycle:

(A) Synthesis of carbamoyl phosphate and citrulline
(B) Synthesis of citrulline and argininosuccinate
(C) Synthesis of argininosuccinate and arginine
(D) Synthesis of carbamoyl phosphate and argininosuccinate

224. Daily excretion of nitrogen by an adult man is about

(A) 15–20 mg (B) 1.5–2 gm
(C) 5–10 gm (D) 15–20 gm

225. Maple syrup urine diseases is an inborn error of metabolism of

(A) Sulphur-containing amino acids
(B) Aromatic amino acids
(C) Branched chain amino acids
(D) Dicarboxylic amino acids

226. Cystinuria results from inability to

(A) Metabolise cysteine
(B) Convert cystine into cysteine
(C) Incorporate cysteine into proteins
(D) Reabsorb cystine in renal tubules

227. The defective enzyme in histidinemia is

(A) Histidine carboxylase
(B) Histidine decarboxylase
(C) Histidase
(D) Histidine oxidase

228. All the following statements about phenylketonuria are correct except

(A) Phenylalanine cannot be converted into tyrosine
(B) Urinary excretion of phenylpyruvate and phenyllactate is increased
(C) It can be controlled by giving a low-phenylalanine diet
(D) It leads to decreased synthesis of thyroid hormones, catecholamines and melanin

229. All the following statements about albinism are correct except

(A) Tyrosine hydroxylase (tyrosinase) is absent or deficient in melanocytes
(B) Skin is hypopigmented
(C) It results in mental retardation
(D) Eyes are hypopigmented

230. Glycine is not required for the formation of

(A) Taurocholic acid (B) Creatine
(C) Purines (D) Pyrimidines

231. Histamine is formed from histidine by

(A) Deamination (B) Dehydrogenation
(C) Decarboxylation (D) Carboxylation

232. DOPA is an intermediate in the synthesis of

(A) Thyroid hormones
(B) Catecholamines
(C) Melanin
(D) Catecholamines and melanin

233. All the following statements about pepsin are correct except

(A) It is smaller than pepsinogen
(B) It is formed by the action of HCl on its precursor
(C) Its optimum pH is 1.0–2.0
(D) It hydrolyses the C-terminal and N-terminal peptide bonds of proteins

234. Pancreatic juice contains the precursors of all of the following except

(A) Trypsin (B) Chymotrypsin
(C) Carboxypeptidase (D) Aminopeptidase

235. The only correct statement about chymotrypsin is

(A) It is formed from trypsin
(B) Carboxypeptidase converts trypsin into chymotrypsin
(C) Its optimum pH is around 7
(D) It hydrolyses peptide bonds involving basic amino acids

236. The portion of the antigen molecule which is recognized by antibody is known as

(A) Hapten (B) Epitope
(C) Complement (D) Variable region

237. All the following statements about haptens are true except

(A) They have high molecular weights
(B) They cannot elicit an immune response by themselves
(C) When combined with some other large molecule, they can elicit an immune response
(D) Once an immune response develops, the free hapten can be recognized by the antibody

238. Antigens and haptens have the following similarity:

(A) They have high molecular weights
(B) They can elicit immune response by themselves
(C) They can elicit an immune response only in association with some other large molecule
(D) Once an immune response develops, free antigen and free hapten can be recognized by the antibody

239. The minimum number of polypeptide chains in an immunoglobulin is

(A) Two (B) Four
(C) Five (D) Six

240. Light chains of immunoglobulins are of following types:

(A) Alpha and kappa (B) Alpha and gamma
(C) Lambda and delta (D) Kappa and lambda

241 Immunoglobulins are classified on the basis of

(A) Type of light chains
(B) Type of heavy chains
(C) Types of light and heavy chains
(D) Molecular weight

242. The molecular weight of light chains is

(A) 10,000–15,000 (B) 20,000–25,000
(C) 25,000–50,000 (D) 50,000–75,000

243. The molecular weight of heavy chains is

(A) 20,000–25,000 (B) 25,000–50,000
(C) 50,000–70,000 (D) 70,000–1,00,000

244. Secretory component is present in

(A) IgA (B) IgG
(C) IgM (D) All of these

245. The variable region of light chains is the

(A) N-terminal quarter (B) N-terminal half
(C) C-terminal quarter (D) C-terminal half

246. The variable region of light chain is the
(A) N-terminal quarter
(B) N-terminal half
(C) C-terminal quarter
(D) C-terminal half

247. The variable region of light chains has
(A) One hypervariable region
(B) Two hypervariable regions
(C) Three hypervariable regions
(D) Four hypervariable regions

248. The variable region of heavy chains has
(A) One hypervariable region
(B) Two hypervariable regions
(C) Three hypervariable regions
(D) Four hypervariable regions

249. The most abundant immunoglobulin in plasma is
(A) IgA (B) IgG
(C) IgM (D) IgD

250. The largest immunoglobulin is
(A) IgA (B) IgG
(C) IgM (D) IgD

251. The plasma concentration of IgA is
(A) 1–5 mg/dl (B) 40–200 mg/dl
(C) 60–500 mg/dl (D) 700–1,500 mg/dl

252. An immunoglobulin found in exocrine secretions is
(A) IgA (B) IgG
(C) IgM (D) IgE

253. Allergic reactions are mediated by
(A) IgA (B) IgG
(C) IgD (D) IgE

254. An immunoglobulin which can cross the placental barrier is
(A) IgA (B) IgM
(C) IgD (D) None of these

255. IgM possesses
(A) Two light chains and two heavy chains
(B) Four light chains and four heavy chains
(C) Six light chains and six heavy chains
(D) Ten light chains and ten heavy chains

256. The immunoglobulin having the longest half-life is
(A) IgA (B) IgG
(C) IgM (D) IgE

257. The half-life of IgG is
(A) 2–3 days (B) 5–6 days
(C) 8–10 days (D) 20–25 days

258. Recognition of antigen is the function of
(A) Variable region of light chains
(B) Variable regions of light and heavy chains
(C) Constant region of heavy chains
(D) Constant regions of light and heavy chains

259. The effector function of antibody is performed by
(A) Variable region of light chains
(B) Constant region of heavy chains
(C) Variable regions of light and heavy chains
(D) Constant regions of light and heavy chains

260. Complement system can be activated by binding of antigen to
(A) IgA (B) IgD
(C) IgE (D) IgM

261. C1 component of classical complement pathway is made up of
(A) Complements 1q and 1r
(B) Complements 1q and 1s
(C) Complements 1r and 1s
(D) Complements 1q, 1r and 1s

262. The components of complement system are activated by
(A) Microsomal hydroxylation
(B) Phosphorylation
(C) Glycosylation
(D) Proteloysis

263. The component system forms a membrane attack complex made up of
(A) Complements 1q, 1r and 1s
(B) Complements 1, 2, 3 and 4
(C) Complements 5b, 6, 7 and 8
(D) Factors B and D

264. Factors B and D are required in

(A) The classical pathway of complement fixation
(B) The alternate complement pathway
(C) Both (A) and (B)
(D) None of these

265. The alternate complement pathway doesn't involve

(A) Antigen-antibody complex
(B) Complement 3
(C) Factors B and D
(D) Membrane attack unit

266. Antibody diversity arises from

(A) Gene amplification
(B) Gene re-arrangement
(C) Alternative splicing
(D) All of these

267. A light chain gene is constructed from the following segments:

(A) Variable and constant segments
(B) Variable, joining and constant segments
(C) Variable, diversity and constant segments
(D) Variable, joining, diversity and constant segments

268. In metabolic point of view, amino acids are classified as

(A) Glycogenic
(B) Ketogenic
(C) Glycogenic or Ketogenic
(D) All of these

269. Diversity segments are present in

(A) Light chain genes
(B) Heavy chain genes
(C) Light and heavy chain genes
(D) None of these

270. Constant segments of heavy chains are of

(A) Five types (B) Six types
(C) Seven types (D) Eight types

271. Gamma heavy chains are of

(A) Two types (B) Three types
(C) Four types (D) Five types

272. Gamma heavy chains are present in

(A) IgA (B) IgG
(C) IgM (D) IgD

273. Heavy chains in IgD are of following type:

(A) Alpha (B) Gamma
(C) Delta (D) Epsilon

274. On exposure to any antigen, the first antibody to be formed is of the following class:

(A) IgA (B) IgG
(C) IgM (D) IgE

275. Constant segment genes of heavy chains are present in a cluster in which the first gene on side is

(A) Alpha (B) Gamma
(C) Delta (D) None of these

276. Cell-mediated immunity is the function of

(A) B lymphocytes (B) T lymphocytes
(C) Plasma cells (D) Basophils

277. The most abundant T cells are

(A) Cytotoxic T cells (B) Helper T cells
(C) Suppressor T cells (D) Memory T cells

278. T cells can recognise

(A) Free antigens
(B) Antigens bound to cells
(C) Antigens bound to antibodies
(D) Antigens bound to MHC proteins

279. MHC proteins are unique to

(A) Each cell (B) Each organ
(C) Each individual (D) Each species

280. MHC class I proteins are present on the surface of

(A) B cells only (B) T cells only
(C) Macrophages only (D) All cells

281. MHC class I proteins, in conjunction with antigens are recognised by

(A) Cytotoxic T cells (B) Helper T cells
(C) Suppressor T cells (D) Memory T cells

282. MHC class II proteins are present on the surface of

(A) All cells
(B) B lymphocytes only
(C) Macrophages only
(D) Macrophages and B lymphocytes

283. MHC Class II proteins, in conjunction with antigens, are recognised by

(A) Cytotoxic T cells
(B) Helper T cells
(C) Suppressor T cells
(D) Memory T cells

284. CD 8 is a transmembrane glycoprotein present in

(A) Cytotoxic T cells
(B) Helper T cells
(C) Suppressor T cells
(D) Memory T cells

285. CD 4 is a transmembrane glycoprotein present in

(A) Cytotoxic T cells (B) Helper T cells
(C) Suppressor T cells (D) Memory T cells

286. CD 3 complex and p 56^{lck} proteins are present in

(A) Cytotoxic T cells (B) Helper T cells
(C) Both (A) and (B) (D) None of these

287. Cytotoxic T cells release

(A) Perforins
(B) Interleukins
(C) Colony stimulating factors
(D) Tumour necrosis factor

288. Helper T cells release

(A) Interleukins
(B) Colony stimulating factors
(C) Tumour necrosis factor
(D) All of these

289. MHC Class III proteins include

(A) Immunoglobulins
(B) Components of complement system
(C) T cells receptors
(D) CD4 and CD8 proteins

290. Human immunodeficiency virus destroys

(A) Cytotoxic T cells (B) Helper T cells
(C) B cells (D) Plasma cells

291. In allergic diseases, the concentration of the following is increased in plasma:

(A) IgA (B) IgG
(C) IgD (D) IgE

292. IgE has a tendency to attach to

(A) Basophils (B) Mast cells
(C) Both (A) and (B) (D) None of these

293. Reaginic antibody is

(A) IgA (B) IgG
(C) IgD (D) IgE

294. Active immunity can be produced by administration of

(A) Killed bacteria or viruses
(B) Live attenuated bacteria or viruses
(C) Toxoids
(D) All of these

295. Passive immunity can be produced by administration of

(A) Pure antigens
(B) Immunoglobulins
(C) Toxoids
(D) Killed bacteria or viruses

296. Helper T cells release all the following except

(A) Interleukins
(B) Colony stimulating factors
(C) Perforins
(D) Tumour necrosis factor

297. IgG cleaved by papain into

(A) Two light and two heavy chains
(B) Two F_{ab} and one F_c fragments
(C) Two pairs of one light and one heavy chain each
(D) One F_{ab} and two F_c fragments

298. Bence-Jones protein is

(A) An immunoglobulin
(B) A dimer of heavy chains
(C) A dimer of light chains
(D) A dimer of one heavy and one light chains

299. Bence-Jones proteins possess all the following properties except

(A) They are dimers of light chains
(B) Their amino acids sequences are identical
(C) Their N-terminal halves have variable amino acid sequences
(D) Their C-terminal halves have constant amino acid sequences

300. A Zwitterion is

(A) Positive ion (B) Negative ion
(C) Both (A) and (C) (D) None of these

301. After accounting for SDA, the net gain of energy from 25 gm of proteins is about

(A) 70 kcal (B) 100 kcal
(C) 130 kcal (D) 200 kcal

302. After accounting for SDA, the net gain of energy from 25 gm of carbohydrates is about

(A) 70 kcal (B) 95 kcal
(C) 100 kcal (D) 105 kcal

303. After accounting for SDA, the net gain of energy from 100 gm of fat is about

(A) 600 kcal (B) 780 kcal
(C) 900 kcal (D) 1020 kcal

304. If proteins, carbohydrates and fats are consumed together:

(A) The total SDA is the sum of individual SDAs of proteins, carbohydrates and fats
(B) The total SDA is more than the sum of individual SDAs of proteins, carbohydrates and fats
(C) Carbohydrates and fats lower the SDA of proteins
(D) Proteins raise the SDA of carbohydrates and fats

305. After calculating the energy requirement of a person:

(A) 10% kcal are subtracted on account of SDA
(B) 10% kcal are added on account of SDA
(C) 20% kcal are subtracted on account of SDA
(D) 20% kcal are subtracted on account of SDA

306. The recommended energy intake for an adult sedentary Indian man is

(A) 1,900 kcal/day (B) 2,400 kcal/day
(C) 2,700 kcal/day (D) 3,000 kcal/day

307. The recommended energy intake for an adult sedentary Indian woman is

(A) 1,900 kcal/day (B) 2,200 kcal/day
(C) 2,400 kcal/day (D) 2,700 kcal/day

308. During pregnancy, the following should be added to the calculated energy requirement:

(A) 300 kcal/day (B) 500 kcal/day
(C) 700 kcal/day (D) 900 kcal/day

309. During first six months of lactation, the following increment in energy intake is recommended:

(A) 200 kcal/day (B) 300 kcal/day
(C) 550 kcal/day (D) 1,000 kcal/day

310. The proximate principles of diet are

(A) Vitamins and minerals
(B) Proteins
(C) Carbohydrates and fats
(D) Carbohydrates, fats and proteins

311. The limiting amino acid in wheat is

(A) Leucine (B) Lysine
(C) Cysteine (D) Methionine

312. The limiting amino acid in pulses is

(A) Leucine (B) Lysine
(C) Tryptophan (D) Methionine

313. Maize is poor in

(A) Lysine
(B) Methionine
(C) Tryptophan
(D) Lysine and tryptophan

314. The percentage of ingested protein/ nitrogen absorbed into blood stream is known as

(A) Net protein utilisation
(B) Protein efficiency ratio
(C) Digestibility coefficient
(D) Biological value of protein

315. Biological value of a protein is

(A) The percentage of ingested protein/nitrogen absorbed into circulation
(B) The percentage of ingested protein/nitrogen in the body
(C) The percentage of ingested protein utilised for protein synthesis in the body
(D) The gain in body weight (gm) per gm of protein ingested

316. Net protein utilisation depends upon

(A) Protein efficiency ratio
(B) Digestibility coefficient
(C) Digestibility coefficient and protein efficiency ratio
(D) Digestibility coefficient and biological value

317. The gain in body weight (gm) per gm of protein ingested is known as

(A) Net protein utilisation
(B) Protein efficiency ratio
(C) Digestibility coefficient
(D) Biological value of protein

318. The following is considered as reference standard for comparing the nutritional quality of proteins:

(A) Milk proteins (B) Egg proteins
(C) Meat proteins (D) Fish proteins

319. Biological value of egg proteins is about

(A) 70 % (B) 80 %
(C) 86 % (D) 94 %

320. The following has the highest protein efficiency ratio:

(A) Milk proteins (B) Egg proteins
(C) Meat proteins (D) Fish proteins

321. The following has the lowest protein efficiency ratio:

(A) Maize proteins (B) Wheat proteins
(C) Milk proteins (D) Rice proteins

322. Protein content of egg is about

(A) 10% (B) 13%
(C) 16% (D) 20%

323. Protein content of meat is about

(A) 10% (B) 13%
(C) 16% (D) 20%

324. Protein content of rice is about

(A) 7% (B) 12%
(C) 15% (D) 20%

325. The calorific value of wheat is about

(A) 2.5 kcal/gm (B) 3.5 kcal/gm
(C) 4.5 kcal/gm (D) 5.5 kcal/gm

326. For vegetarians, pulses are an important source of

(A) Carbohydrates (B) Proteins
(C) Fat (D) Iron

327. The amino acids present in pulses can supplement the limiting amino acids of

(A) Cereals (B) Milk
(C) Fish (D) Nuts and beans

328. Milk is a good source of

(A) Proteins, calcium and iron
(B) Proteins, calcium and ascorbic acid
(C) Proteins, lactose and retinol
(D) Proteins, lactose and essential fatty acids

329. Milk is a good source of all of the following except

(A) Essential amino acids
(B) Vitamin C
(C) Galactose
(D) Calcium and phosphorous

330. Milk is poor in

(A) Cholesterol (B) Retinol
(C) Calcium (D) Iron

331. Egg is rich in all of the following except

(A) Cholesterol (B) Saturated fatty acids
(C) Ascorbic acid (D) Calcium

332. A phosphoprotein present in egg is

(A) Casein (B) Albumin
(C) Ovoglobulin (D) Ovovitellin

333. Consumption of raw eggs can cause deficiency of

(A) Calcium (B) Lipoic acid
(C) Biotin (D) Vitamin A

334. Egg is poor in

(A) Essential amino acids
(B) Carbohydrates
(C) Avidin
(D) Biotin

335. Cholesterol is present in all the following except

(A) Milk (B) Fish
(C) Egg white (D) Egg yolk

336. Meat is rich in all of the following except

(A) Iron (B) Fluorine
(C) Copper (D) Zinc

337. Kwashiorkor occurs when the diet is severely deficient in

(A) Iron (B) Calories
(C) Proteins (D) Essential fatty acids

338. Clinical features of Kwashiorkor include all of the following except

(A) Mental retardation (B) Muscle wasting
(C) Oedema (D) Anaemia

339. Kwashiorkor usually occurs in

(A) The post-weaning period
(B) Pregnancy
(C) Lactation
(D) Old age

340. Marasmus occurs from deficient intake of

(A) Essential amino acids
(B) Essential fatty acids
(C) Calories
(D) Zinc

341. Marasmus differs from Kwashiorkor in the which of these following respect

(A) Mental retardation occurs in kwashiorkor but not in marasmus
(B) Growth is retarded in kwashiorkor but not in marasmus
(C) Muscle wasting occurs in marasmus but not kwashiorkor
(D) Subcutaneous fat disappears in marasmus but not in kwashiorkor

342. Energy reserves of an average well-fed adult man are about

(A) 50,000 kcal (B) 100,000 kcal
(C) 200,000 kcal (D) 300,000 kcal

343. During starvation, the first reserve nutrient to be depleted is

(A) Glycogen (B) Proteins
(C) Triglycerides (D) Cholesterol

344. Synthesis of the following enzymes is increased during starvation.

(A) Digestive enzymes
(B) Gluconeogenic enzymes
(C) Urea cycle enzymes
(D) Glucokinase

345. In hypoparathyroidism

(A) Plasma calcium and inorganic phosphorous are low
(B) Plasma calcium and inorganic phosphorous are high
(C) Plasma calcium is low and inorganic phosphorous high
(D) Plasma calcium is high and inorganic phosphorous low

346. The number of amino acid residues in calcitonin in

(A) 9 (B) 32
(C) 51 (D) 84

347. Calcitonin is synthesised in

(A) Parathyroid glands
(B) Thyroid gland
(C) Pars intermedia of pituitary
(D) Adrenal cortex

348. Plasma calcium is lowered by

(A) Parathormone (B) Calcitonin
(C) Aldosterone (D) Deoxycorticosterone

349. α Cells of Islets of Langerhans secrete

(A) Insulin (B) Glucagon
(C) Somatostatin (D) Cholecystokinin

350. A/G ratio is

(A) Strength of proteins
(B) ratio of serum proteins
(C) ratio of ceruloplasmin
(D) None of these

351. Insulin is made up of

(A) A single polypeptide chain having 51 amino acid residues
(B) A single polypeptide chain having 84 amino acid residues
(C) A-chain having 21 and B-chain having 30 amino acid residues
(D) A-chain having 30 and B-chain having 21 amino acid residues

352. The number of amino acid residues in pre-proinsulin is

(A) 51 (B) 84
(C) 109 (D) 119

353. Pre-proinsulin contains a signal sequence having

(A) 9 amino acid residues
(B) 19 amino acid residues
(C) 27 amino acid residues
(D) 33 amino acid residues

354. The number of intra-chain disulphide bonds in pro-insulin:

(A) One (B) Two
(C) Three (D) Four

355. Pentagastrin is a

(A) Naturally occurring form of gastrin
(B) Inactive metabolite of gastrin
(C) Active metabolite of gastrin
(D) Synthetic form of gastrin

356. Secretion of gastrin is evoked by

(A) Entry of food into stomach
(B) Vagal stimulation
(C) Lower aliphatic alcohols
(D) All of these

357. Gastrin stimulates

(A) Gastric motility (B) Gastric secretion
(C) Both (A) and (B) (D) None of these

358. Secretin is made up of

(A) 17 amino acids (B) 27 amino acids
(C) 37 amino acids (D) 47 amino acids

359. Secretin causes all of the following except

(A) Secretion of pancreatic juice
(B) Secretion of bile
(C) Inhibition of gastric secretion
(D) Stimulation of intestinal motility

360. All of the following statements about cholecystokinin pancreozymin are true except

(A) It is secreted by mucosa of small intestine
(B) It stimulates secretion of pancreatic juice rich in enzymes
(C) It stimulates contraction of gall bladder
(D) It inhibits gastric motility

361. All of the following statements about pancreatic somatostain are true except

(A) It is secreted by δ cells of islets of Langerhans
(B) It stimulates the secretion of gastrin
(C) It inhibits the secretion of secretin
(D) It inhibits the secretion of cholecystokinin-pancreozymin

362. Histidine is converted into histamine by

(A) Carboxylation (B) Decarboxylation
(C) Methylation (D) Hydroxylation

363. Histamine is synthesised in

(A) Brain (B) Mast cells
(C) Basophils (D) All of these

364. Histamine causes all the following except

(A) Stimulation of gastric secretion
(B) Vasoconstriction
(C) Pruritus
(D) Increase in capillary permeability

365. H_2-receptors are blocked by

(A) Diphenhydramine (B) Mepayramine
(C) Pyrilamine (D) Cimetidine

366. Serotonin is synthesised from

(A) Serine (B) Phenylalanine
(C) Tyrosine (D) Tryptophan

367. All the following statements about serotonin are true except

(A) It causes vasolidatation
(B) It causes bronchoconstriction
(C) It is metabolized by monoamine oxidase
(D) Its metabolite is 5-hydroxyindole acetic acid

368. All the following statements about angiotensin are true except

(A) Its precursor is an α_2-globulin
(B) Its active form is an octapeptide
(C) It is a vasodilator
(D) It increases the secretion of aldosterone

369. Methyl dopa decreases blood pressure by

(A) Inhibiting the synthesis of catecholamines
(B) Antagonising the action of aldosterone
(C) Stimulating the release of renin
(D) Inhibiting the breakdown of angiotensin

370. Binding of gamma-aminobutyric acid to its receptors in brain increases the permeability of cell membrane to

(A) Cl^- (B) Na^+
(C) K^+ (D) Ca^{++}

371. Binding of acetylcholine to its receptors increases the permeability of cell membrane to

(A) Ca^{++} (B) Na^+
(C) K^+ (D) Na^+ and K^+

372. All of the following are glycoproteins except

(A) Collagen (B) Albumin
(C) Transferrin (D) IgM

373. Sialic acids are present in

(A) Proteoglycans (B) Glycoproteins
(C) Both (A) and (B) (D) None of these

374. Hyaluronidase hydrolyses

(A) Hyaluronic acid
(B) Chondroitin sulphate
(C) Heparin
(D) Hyaluronic acid and chondroitin sulphate

375. The most abundant protein in bones is

(A) Collagen type I
(B) Collagen type II
(C) Collagen type III
(D) Non-collagen proteins

376. The most abundant collagen in cartilages is

(A) Type I (B) Type II
(C) Type III (D) Type IV

377. Collagen and elastin have the following similarity:

(A) Both are triple helices
(B) Both have hydroxyproline residues
(C) Both have hydrolysine residues
(D) Both are glycoproteins

378. Abnormal collagen structure is seen in all of the following except

(A) I-cell disease
(B) Osteogenesis imperfecta
(C) Menke's disease
(D) Ehlers-Danlos sydrome

379. I-cell disease results from absence of the following from lysosomal enzymes:

(A) Signal sequence
(B) Mannose-6-phosphate
(C) Sialic acid
(D) A serine residue

380. In I-cell disease, lysosomal enzymes

(A) Are not synthesised
(B) Are inactive
(C) Lack signal sequence
(D) Cannot reach lysosomes

381. Renal glycosuria occurs due to

(A) Increased filtration of glucose in glomeruli
(B) Increased secretion of glucose by renal tubular cells
(C) Decreased reabsorption of glucose by renal tubular cells
(D) Increased conversion of glycogen into glucose in tubular cells

382. Haematuria can occur in

(A) Haemolytic anaemia

(B) Mismatched blood transfusion
(C) Yellow fever
(D) Stone in urinary tract

383. Haematuria can occur in all of the following except

(A) Acute glomerulonephritis
(B) Cancer of urinary tract
(C) Stone in urinary tract
(D) Mismatched blood transfusion

384. Chyluria can be detected by addition of the following to the urine:

(A) Sulphosalicylic acid (B) Nitric acid
(C) Acetic anhydride (D) Chloroform

385. Normal range of serum urea is

(A) 0.6–1.5 mg/dl (B) 9–11 mg/dl
(C) 20–45 mg/dl (D) 60–100 mg/dl

386. Normal range of serum creatinine is

(A) 0.6–1.5 mg/dl (B) 9–11 mg/dl
(C) 20–45 mg/dl (D) 60–100 mg/dl

387. Standard urea clearance is

(A) 54 ml/min (B) 75 ml/min
(C) 110 ml/min (D) 130 ml/min

388. Maximum urea clearance is

(A) 54 ml/min (B) 75 ml/min
(C) 110 ml/min (D) 130 ml/min

389. Average creatinine clearance in an adult man is about

(A) 54 ml/min (B) 75 ml/min
(C) 110 ml/min (D) 130 ml/min

390. Inulin clearance in an average adult man is about

(A) 54 ml/min (B) 75 ml/min
(C) 110 ml/min (D) 130 ml/min

Q391. Among the following, a test of tubular function is

(A) Creatinine clearance
(B) Inulin clearance
(C) PAH clearance
(D) PSP excretion test

392. A simple way to assess tubular function is to withhold food and water for 12 hours and, then, measure

(A) Serum urea
(B) Serum creatinine
(C) Urine output in one hour
(D) Specific gravity of urine

393. Among the following, the most sensitive indicator of glomerular function is

(A) Serum urea
(B) Serum creatinine
(C) Urea clearance
(D) Creatinine clearance

394. All the following statements about inulin are correct except

(A) It is completely non-toxic
(B) It is completely filtered by glomeruli
(C) It is not reabsorbed by tubular cells
(D) It is secreted by tubular cells

395. Non-protein nitrogenous substances in blood include all of the following except

(A) Urea (B) Uric acid
(C) Creatinine (D) Inositol

396. Non-protein nitrogenous substances in blood are raised in

(A) Starvation
(B) Liver damage
(C) Renal failure
(D) All of these

397. Creatinine clearance is deceased in

(A) Acute tubular necrosis
(B) Acute glomerulonephritis
(C) Hypertension
(D) Myopathies

398. Serum amylase is increased in

(A) Acute parotitis (B) Acute pancreatitis
(C) Pancreatic cancer (D) All of these

399. Maximum rise in serum amylase occurs in

(A) Acute parotitis
(B) Acute pancreatitis
(C) Chronic pancreatitis
(D) Pancreatic cancer

400. Serum lipase is increased in

(A) Acute parotitis (B) Acute pancreatitis
(C) Infective hepatitis (D) Biliary obstruction

401. Which one of the following metabolites is not directly produced in the hexose monophosphate pathway?

(A) Fructose-6-phosphate
(B) Dihydroxy acetone phosphate
(C) CO_2
(D) Erythrose-4-phosphate

402. Which one of the following statements concerning glucose-6-phosphate dehydrogenase deficiency is correct?

(A) Young R.B.Cs, particularly reticulocytes, contain the highest enzyme activity cells show less enzyme activity
(B) Glucose-6-P Dehydroglucose deficiency leads to disfuction of many tissues
(C) G-6-p Dehydroglucose deficiency is due to a single deletion of a large sequence of DNA in the G-6-PD gene
(D) G-6-PD deficiency is precipitated by ingestion of drugs such as aspirin

403. The phenomenon of inhibition of glycolysis by O_2 is termed as

(A) Red drop (B) Pasteur effect
(C) Michaelis effect (D) Fischer's effect

404. Seratonin is derived in the body from the following amino acid:

(A) Phenylalanine (B) Histidine
(C) Tryptophan (D) Serine

405. Which amino acid is a lipotropic factor?

(A) Lysine (B) Leucine
(C) Tryptophan (D) Methionine

406. Which among the following is a nutritionally essential amino acid for man ?

(A) Alanine (B) Glycine
(C) Tyrosine (D) Tryptophan

407. The essential amino acids

(A) Must be supplied in the diet because the organism has lost the capacity to aminate the corresponding ketoacids
(B) Must be supplied in the diet because the human has an impaired ability to synthesize the carbon chain of the corresponding keto-acids
(C) Are identical in all species studied
(D) Are defined as those amino acids which cannot be synthesized by the organism at a rate adequate to meet metabolic requirements

408. Which among the following is an essential amino acid?

(A) Cysteine (B) Leucine
(C) Tyrosine (D) Aspartic acid

409. Which among the following is a basic amino acid?

(A) Aspargine (B) Arginine
(C) Proline (D) Alanine

410. This amino acid cannot have optical isomers:

(A) Alanine (B) Histidine
(C) Threonine (D) Glycine

411. The amino acid which contains a guanidine group is

(A) Histidine (B) Arginine
(C) Citrulline (D) Ornithine

412. GABA(gama amino butyric acid) is

(A) Post-synaptic excitatory transmitter
(B) Post-synaptic inhibitor transmitter
(C) activator of glia-cell function
(D) inhibitor of glia-cell function

413. Sulphur-containing amino acid is

(A) Glutathione (B) Chondroitin sulphate
(C) Homocysteine (D) Tryptophan

414. The useful reagent for detection of amino acids is

(A) Molisch reagent
(B) Dichlorophenol Indophenol
(C) Ninhydrin
(D) Biuret

415. The amino acid which contains an indole group is

(A) Histidine (B) Arginine
(C) Glycine (D) Tryptophan

416. Sakaguchi reaction is answered by

(A) Lysine
(B) Ornithine
(C) Arginine
(D) Arginino succinic acid

417. The pH of an amino acid depends

(A) Optical rotation (B) Dissociation constant
(C) Diffusion coefficient (D) Chain length

418. When amino acids are treated with neutral formaldehyde, the pH of the mixture

(A) Is not altered
(B) Increases
(C) Decreases
(D) First increases then decreases

419. Which among the following has an imidazole group?

(A) Histidine (B) Tryptophan
(C) Proline (D) Hydroxy proline

420. The amino acid exist as Zwitter ions when they are in

(A) solid state (B) acidic solution
(C) alkaline solution (D) neutral solution

421. Plasma proteins are isolated by

(A) Salting out (B) Electrophoresis
(C) Flourimetry (D) Both (A) and (B)

422. After digestion amino acids

(A) Are absorbed into portal circulation
(B) Are absorbed into lymph
(C) Are excreted to the extent of 50%
(D) Converted into glucose in the intestine

423. Cysteine has the formula:

(A) CH_3SH
(B) $H_2N—CH_2—COOH$
(C) $HS—CH_2—CH(NH_2)—COOH$
(D) $S—CH_2—CH(NH_2)—COOH$
$S—CH_2—CH(NH_2)—COOH$

424. The compound having the formula

$H_2N—CO—NH—CH_2—CH_2—CH_2—CH(NH_2)—COOH$ is

(A) Lysine (B) Glutamine
(C) Serine (D) Citrulline

425. An amino acid which contains a disulphide bond is

(A) Lysine (B) Methionine
(C) Homocysteine (D) Cystine

426. One of the following has a phenolic group:

(A) Histidine (B) Hydroxy lysine
(C) Seratonine (D) Hydroxy proline

427. An amino acid not containing the usual—COOH group is

(A) Alanine (B) Tryptophan
(C) Methionine (D) Taurine

428. Branched chain amino acids are

(A) Cysteine and cystine
(B) Tyrosine and Tryptophan
(C) Glycine and Serine
(D) Valine, Leucine and Isoleucine

429. A Zwitter ion is one which has in aqueous solution:

(A) One positive charge and one negative charge
(B) Two positive charges and one negative charge
(C) Two negative charges and one positive charge
(D) No electrical charges at all

430. The amino acid which gives yellow colour with Ninhydrin in paper chromatography is

(A) Tyrosine (B) Proline
(C) Tryptophan (D) Alanine

431. Hydroxylation of Proline and Lysine in a protein is effected by

(A) Vitamin B_1 (B) Vitamin B_2
(C) Vitamin B_6 (D) Vitamin C

432. Millon's test is for identification of

(A) Tyrosine (B) Tryptophan
(C) Proline (D) Arginine

433. Hopkins-Cole test is for identification of

(A) Tyrosine (B) Tryptophan
(C) Arginine (D) Cysteine

434. Collagen is very rich in

(A) Glycine (B) Serine
(C) Aspartic acid (D) Glutamic acid

435. All amino acids are optically active except

(A) Glycine (B) Serine
(C) Threonine (D) Tryptophan

436. Out of 200 different amino acids form in nature the number of amino acids present in protein:

(A) 20 (B) 25
(C) 40 (D) 35

437. Enzyme catalyzed hydrolysis of proteins produces amino acids of the form:

(A) D (B) L
(C) DL (D) All of these

438. The ionizable groups of amino acids are at least.

(A) 1 (B) 2
(C) 3 (D) 4

439. The neutral amino acid is

(A) Lysine (B) Proline
(C) Leucine (D) Histidine

440. The amino acid containing hydroxyl group:

(A) Alanine (B) Isoleucine
(C) Arginine (D) Threonine

441. The sulphur containing amino acid:

(A) Homoserine (B) Serine
(C) Methionine (D) Valine

442. The basic amino acid:

(A) Glycine (B) Leucine
(C) Histidine (D) Proline

443. The amino acid which synthesizes many hormones:

(A) Valine (B) Phenyl alanine
(C) Alanine (D) Histidine

444. Amino acids are insoluble in

(A) Acetic acid (B) Chloroform
(C) Ethanol (D) Benzene

445. The major end product of protein nitrogen metabolism in man is

(A) Glycine (B) Uric acid
(C) Urea (D) NH_3

446. An amino acid not involved in urea cycle is

(A) Arginine (B) Histidine
(C) Ornithine (D) Citrulline

447. NH_3 is detoxified in brain chiefly as

(A) Urea (B) Uric acid
(C) Creatinine (D) Glutamine

448. In humans, NH_3 is detoxified in liver as

(A) Creatinine (B) Uric acid
(C) Urea (D) Uronic acid

449. The body protein after eighteen years

(A) Remains unchanged
(B) Is decomposed only slightly at intervals of one month
(C) Is in a constant state of flux
(D) Is used only for energy requirement

450. The only known physiological methylating agents in the animal organism are

(A) Choline and betaine
(B) Choline and δ-adenosyl methionine
(C) Betaine and δ-adenyosyl methionine
(D) Dimehtyl glycine and betaine

451. In the synthesis of 1 molecule of urea in the Kreb's Hanseleit cycle, the number of ATPs required is

(A) 1 (B) 2
(C) 3 (D) 4

452. For biosynthesis of proteins

(A) Amino acids only are required
(B) Amino acids and nucleic acids only are required
(C) Amino acid, nucleic acids and ATP only are required
(D) Amino acids, nucleic acids, ATP, GTP, enzymes and activators are required

453. Transmethylation of guanido acetic acid gives

(A) Creatine phosphate
(B) Creatinine
(C) Choline
(D) n-methyl nicotinamide

454. The 2 energy rich compounds needed for protein biosynthesis are

(A) ATP and GTP (B) ATP and UTP
(C) ATP and CTP (D) ATP and TTP

455. The following ketoacid is involved in fixing dietary NH_3 into amino acid:

(A) Pyruvate (B) Oxalo acetate
(C) Oxalo succinate (D) α-keto glutarate

456. The metabolite which sustains urea cycle is

(A) Ornithine
(B) Citrulline
(C) Carbamoyl phosphate
(D) n-acetyl glutamate

457. Tetra hydroglolate can be freed from N^5 methyl tetrahydrofolate only by

(A) Nor epinephrine (B) Ethanol amine
(C) Nicotinamide (D) Vitamin B_{12}

458. Neogenesis of methyl group is

(A) The availability of methyl group form δ adenosyl methionine
(B) The availability of methyl group from betaine
(C) Interaction between N^5 N^{10} methylene tetra hydrofolate with a NAD^+ dependent reductase
(D) Availability of methyl group from methyl B_{12}

459. More creatinine is excreted by

(A) Adult males (B) Adult females
(C) Children (D) Pregnant women

460. A growing peptide in a ribosome can not be shifted to the adjacent ribosome because

(A) It is firmly attached
(B) It will get the amino acid cleaved
(C) The gap between the ribosomes is too big for a shift
(D) The adjacent ribosomes have different composition

461. The first amino acid incorporated in a polypeptide in a ribosome of a human is

(A) N formyl methionine (B) Methionine
(C) Phenyl alanine (D) Hydroxy lysine

462. The first amino acid incorporated in a polypeptide in a ribosome of a bacterium is

(A) N formyl methionine (B) Methionine
(C) Alamine (D) Glycine

463. The integrator between the TCA cycle and urea cycle is

(A) Fumarate (B) Malate
(C) Pyruvate (D) Citrate

464. Bence jones proteinurial characterized by

(A) Non-heat coagulability
(B) Heat coagulability at 100°C
(C) Heat coagulability at 45 to 60°C
(D) Precipitation at 25°C

465. Bence Jones proteins may be excreted in urine of patients suffering from

(A) Tuberculosis (B) Diabetes mellitus
(C) Multiple myeloma (D) Hyperthyroidism

466. Xanthuric acid is an abnormal metabolite of

(A) Xanthine (B) Uric acid
(C) Tyrosine (D) Tryptophan

467. Two nitrogen atoms of Urea in the urea cycle come from

(A) NH_3
(B) One from NH_3 and one from aspartate
(C) One from NH_3 and one from glutamate
(D) One from NH_3 and one from alanine

468. Pyruvic acid can be obtained by transamination of alanine with

(A) α- keto glutaric acid
(B) Acetoacetic acid
(C) β–OH butyric acid
(D) Phosphoenol Pyruvic acid

469. In the synthesis of 1 molecule of urea in the Kreb's Henseleit cycle the number of AMPs formed is

(A) 1 (B) 2
(C) 3 (D) 4

470. Formation of melanin from tyrosine requires the action of

(A) Dopa decarboxylation
(B) Diamine oxidase
(C) Peroxidase
(D) Tyrosinase

471. In one of the following the quality of the protein synthesized is affected:

(A) Diabetes mellitus (B) Gont
(C) Multiple myeloma (D) Primaquine sensitivity

472. Citrulline is an intermediate of

(A) TCA cycle (B) Urea cycle
(C) Pentose cycle (D) Calvin cycle

473. The semialdehydes are formed under the action of enzymes characterised as

(A) Aldolases
(B) Peptidyl lysyl oxidases
(C) Collagenases
(D) Elastases

474. Which of the following statement about the peptide bond is true?

(A) It is a carbon-carbon bond
(B) It has cis hydrogen and oxygen groups
(C) It is planar
(D) It has rotational freedom

475. Isoenzymes for a given reaction

(A) Have different spedificities
(B) Have identical affinities for the same substrate
(C) Exhibit different electrophoretic motilities
(D) Contain similar ratios of different polypeptide chains

476. The highest concentration of cystine can be found in

(A) Melanin (B) Chondroitin sulphate
(C) Myosin (D) Keratin

477. One round of Edman degradation of the peptide: H_2N— Gly—Arg—Lys—Phe—Asp— COOH would result in which of the following structures or their phenyl isothiocyanate derivatives?

(A) H_2N—Gly—Arg—COOH + H_2N—Lys—Phe— Asp—COOH
(B) H_2N—Gly—Arg—Lys—Phe—COOH + Asp
(C) H_2N—Arg—Lys—Phe—Asp—COOH + Gly
(D) H_2N—Gly—Arg—Lys—COOH + H_2N—Phe—Asp—COOH

478. Which of the following techniques is used to separate proteins based upon differences in their mass?

(A) Isoelectric focusing
(B) Dialysis
(C) SDS-gel Electrophoresis
(D) Western blotting

479. The greatest buffering capacity at physiologic pH would be provided by a protein rich in which of the following amino acids ?

(A) Lysine (B) Histidine
(C) Aspartic acid (D) Valine

480. Which one of the amino acids could serve as the best buffer at pH 7?

(A) Glutamic acid (B) Arginine
(C) Valine (D) Histidine

481. Which one of the following statements concerning glutamine is correct?

(A) Contains three tetratable groups
(B) Is classified as an acidic amino acid
(C) Contains an amide group
(D) Migrates to the cathode during electrophoresis at pH 7.0

482. One of the given example is an amino acid:

(A) Oh-Lysine (B) Protein
(C) Leucine (D) Serine

483. The lone pair of electrons at one of the ring nitrogens in the given amino acid makes a potential ligand, which is important in binding the iron atoms in hemoglobin:

(A) Tryptophan (B) Threonine
(C) Histidine (D) Serine

484. The amino acid which is not optically active is

(A) Alanine (B) Glycine
(C) Glutamine (D) Lysine

485. Optically active compounds are capable of

(A) Different reactions
(B) Rotating plane of polarized light
(C) Showing same chemical properties
(D) None of these

486. The reference compound for absolute configuration of optically active compound is

(A) Alanine (B) Lactic acid
(C) Glyceraldehyde (D) Dihydroxy acetone

487. All the standard amino acids except the following have one chiral 'c' atom:

(A) Threonine, Isoleucine
(B) Isoleucine, Alanine
(C) Threonine, Alanine
(D) Alanine, Glutamine

488. The role of complement proteins:

(A) Defense
(B) Helps immunity of the body
(C) Not predicatable
(D) None of these

489. Optical isomers that are mirror images and non superimposable are called

(A) Diastereomers (B) Euantiomers
(C) dl isomers (D) Stereomers

490. Living cells have the unique ability to synthesize only _____ the form of optical isomer due to _____.

(A) 'd' form, stereospecific enzymes
(B) 'l' form stereospecific enzymes
(C) 'd' form, DNA
(D) 'L' form, DNA

491. Isoelectric pH of an amino acid is that pH at which it has a

(A) Positive charge (B) Negative charge
(C) No net charge (D) All of these

492. Albuminoids are similar to

(A) Albumin (B) Globulin
(C) Both A and B (D) None of these

493. Abnormal chain of amino acids in sickle cells anaemia is

(A) Alpha chain (B) Beta chain
(C) Gama chain (D) Delta chain

494. In prehepatic jaundice, protein flocculation test is

(A) Normal/weekly positive
(B) Usually positive
(C) Negative
(D) None of these

495. Side chains of all amino acids contain aromatic rings except

(A) Pheynl alanine (B) Alanine
(C) Tyrosine (D) Tryptophan

496. In Nitroprusside test, amino acid cystein produces

(A) Blue colour complex
(B) Red colour
(C) Yellow colour
(D) Purple colour

497. Bonds that are formed between two cysteine residues is

(A) Disulphide (B) Peptide
(C) Electrostatic (D) Hydrophobic

498. The acid amide of Aspartic acid is

(A) Glutamine (B) Arginine
(C) Aspargine (D) Ornithine

499. It is the only amino acid having an ionizing 'R' group with a pK' near 7 and is important in the active site of some enzymes:

(A) Arginine (B) Cystein
(C) Cystine (D) Histidine

500. Hemoglobin has a high content of this amino acid:

(A) Proline (B) Leucine
(C) Arginine (D) Histicline

501. A hexa peptide with 5 aspartic acid would have a net charge at pH 7:

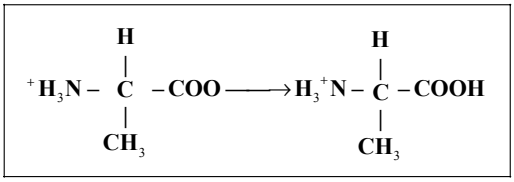
(A) Neutral (B) Positive
(C) Negative (D) Not predictable

502. In the genetic disorder of cystinuria, the patient excretes large quantities of cystine in their urine and its low solubility causes crystalline cystine to precipitate as stones in kidneys. The remedy involves

ingesting Na HCO_3. Reaction of this treatment is

(A) $NaHCO_2$ combines with cystine
(B) $NaHCO_3$ raises the pH above the isoelectric point of cystine
(C) $NaHCO_3$ prevents stone formation by hydrolysis of cystine to cysteine
(D) None of these

503. In the following reaction, Alanine acts as a



(A) Acid (B) Base
(C) Zwitter ion (D) None of these

504. Amino acids excepting histidine are not good buffering agents in cell because

(A) They exist as zwitter ions
(B) Their pk and not in the physiological pH of a cell
(C) Only Histidine has pk of its R group at 6.0 unlike the others which have at a different pH
(D) None of these

505. At neutral pH Alanine has the following structure:

(A) $H_2N-\underset{CH_3}{\overset{H}{C}}-COOH$ (B) $H_3^+N-\underset{CH_3}{\overset{H}{C}}-CO\bar{O}$

(C) $H_2N-\underset{CH_3}{\overset{H}{C}}-CO\bar{O}$ (D) $^+H_2N-\underset{CH_3}{\overset{H}{C}}-CO\bar{O}$

506. The amino acids in which the R groups have a net positive charge at pH 7.0 are

(A) Lysine, Arginine, Histidine
(B) Lysine, Aspargine
(C) Histidine, Aspargine
(D) Glutamine, Arginine

507. Apolipoproteins are

(A) Al (B) Al1
(C) C1 (D) All of these

508. The amino acid which has a pK near 4 and thus is negatively charged at pH 7 is

(A) Alanine (B) Glutamic acid
(C) Glutamine (D) Aspargine

509. The side chain of which of the following amino acid contain sulphur atom?

(A) Methionine (B) Threonine
(C) Leucine (D) Tryptophan

510. Which of the followings gives a positive test for Ninhydrin?

(A) Reducing sugars (B) Triglycerides
(C) Alpha aminoacids (D) Esterified Fats

511. In glutathione (a tripeptide) is present apart from Glutamic acid and cysteine:

(A) Serine (B) Glycine
(C) Leucine (D) Phenyl alanine

512. 2-Amino 3-OH propanoic acid is

(A) Glycine (B) Alanine
(C) Valine (D) Serine

513. All amino acids have one asymmetric carbon atom, except

(A) Arginine (B) Aspargine
(C) Histidine (D) Glycine

514. Number of amino acids present in the plant, animal and microbial proteins:

(A) 20 (B) 80
(C) 150 (D) 200

515. Immunoglobulins are characterized by their

(A) Heavy chains
(B) Molecular weight
(C) Light chains
(D) Electrophoretic behaviour

516. The bond in proteins that is not hydrolysed under usual conditions of denaturation:

(A) Hydrophobic bond (B) Hydrogen bond
(C) Disulphide bond (D) Peptide bonds

517. If the amino group and a carboxylic group of the amino acid are attached to same carbon atom, the amino acid is called

(A) Alpha (B) Beta
(C) Gamma (D) Delta

518. Zymogen is

(A) An intracellular enzyme
(B) Serum enzyme
(C) A complete extracellular enzyme
(D) An inactivated enzyme

519. SGOT level in a adult is

(A) 5–40 units/dl (B) 1–4 units/dl
(C) 5–15 units/dl (D) 50–100 units/dl

520. Activity of ceruloplasmin shown in vitro:

(A) Reductase (B) Hydrolase
(C) Ligase (D) Oxidase

521. Increased serum alanine during fasting is due to

(A) Breakdown of muscle proteins
(B) Decreased utilization of non essential amino acids
(C) Leakage of aminoacids to plasma
(D) Impaired renal function

522. The following 4 amino acids are required for completion of urea cycle except

(A) Aspartic acid (B) Arginine
(C) Ornithine (D) Glycine

523. Number of amino acids present in the dietary proteins:

(A) 22 (B) 23
(C) 20 (D) 19

524. Urea synthesis takes place in

(A) Blood (B) Liver
(C) Kidney (D) Heart

525. All followings are ketogenic aminoacids except

(A) Leucine (B) Isoleucine
(C) Phenyl alanine (D) Glycine

526. The amino acid containing an indole ring:

(A) Tryptophan (B) Arginine
(C) Threonine (D) Phenylalanine

527. Histidine is converted to histamine through the process of

(A) Transamination
(B) Decarboxylation
(C) Oxidative deamination
(D) Urea cycle

528. Physiologically active configuration of amino acids:

(A) L
(B) D
(C) For some amino acids it is either of two
(D) Neither L nor D

529. Cystine is synthesized from

(A) Cysteine (B) Methionine
(C) Arginine (D) Leucine

530. The major constituent of the proteins of hair and keratin of skin:

(A) Arginine (B) Cysteine
(C) Glycine (D) Arginine

531. NH_3 is removed from brain mainly by

(A) Creatinine formation
(B) Uric acid production
(C) Urea formation
(D) Glutamine formation

532. Mechanism by which NH_3 is removed from the kidneys is

(A) Urea formation
(B) Uric acid formation
(C) Creatinine formation
(D) None of these

533. Low density plasma proteins are rich in

(A) Chylomicrons (B) Cholesterol
(C) Triglycerides (D) Phospholipids

534. Transcortins are

(A) Mucoproteins (B) Glycoproteins
(C) Metalloproteins (D) Lipoproteins

535. Proteins that carries Iron into different tissues is

(A) Ceruloplasmin (B) Trans cortin
(C) Mucoproteins (D) Glycoproteins

536. Naturally occurring amino acids have

(A) L-Configuration (B) D-Configuration
(C) DL-Configuration (D) None of these

537. Abnormal chain of aminoacids in sickle cell anemia is

(A) β-chain (B) β-chain
(C) γ-chain (D) r-chain

538. A dietary deficiency of tryptophan and nicotinate leads to

(A) Beri Beri (B) Xerophthalmia
(C) Anemia (D) Pellegra

539. Which one of the following is an essential amino acid?

(A) Arginine (B) Tyrosine
(C) Phenylalanine (D) Proline

540. One of the following amino acid is solely ketogenic:

(A) Lysine (B) Alanine
(C) Valine (D) Glutamate

541. Along with CO_2, NH_3 and ATP, the amino acid that is needed in urea cycle is

(A) Alanine (B) Isoleucine
(C) Aspartate (D) Glycine

542. Isoelectric pH of an amino acid is that pH at which it has a

(A) Positive charge (B) Negative charge
(C) No charge (D) None of these

543. Which of the following contributes nitrogen atoms to both purine and pyrimidine rings?

(A) Aspartate
(B) Carbamoyl phosphate
(C) CO_2
(D) Glutamine

544. Which amino acid is a lipotropic factor?

(A) Lysine (B) Lecuine
(C) Tryptophan (D) Methionine

545. Which of the following protein is rich in cysteine?

(A) Elastine (B) Collagen
(C) Fibrin (D) Keratin

546. Which amino acid is present at 6^{th} position of β-chain of Hbs instead of glutamate in HbA?

(A) Cysteine (B) Valine
(C) Aspartate (D) Glutamate

547. The amino acid which contains an indole group is

(A) Histidine (B) Arginine
(C) Cystine (D) Tryptophan

548. From two amino acids peptide bond formation involves removal of one molecule of

(A) Water (B) Ammonia
(C) Carbondioxide (D) Carboxylic acid

549. Polymers of more than 100 amino acids are termed

(A) Proteins (B) Polypeptides
(C) Both (A) and (B) (D) None of these

550. The example of globulins:

(A) Leucosin (B) Tuberin
(C) Oryzenin (D) Legunelin

551. The example of scleroproteins:

(A) Glutamin (B) Giladin
(C) Salmine (D) Elastin

552. The example of phosphoprotein:

(A) Mucin (B) Ovovitellin
(C) Ovomucoid (D) Tendomucoid

553. The example of metalloproteins:

(A) Siderophilin (B) OREES mucoid
(C) Elastin (D) All of these

554. The example of chromoprotein:

(A) Salmine (B) Catalase
(C) Zein (D) Gliadin

555. Deamination is _____ of amino group.

(A) Removal (B) Addition
(C) Supplementation (D) None of these

556. Proteins produce polypeptides from proteins by

(A) Oxidizing (B) Reducing
(C) Hydrolyzing (D) None of these

557. Proteins react with biuret reagent which is suggestive of 2 or more

(A) Hydrogen bonds (B) Peptide bonds
(C) Disulphide bonds (D) Hydrophobic bonds

558. The disulphide bond is not broken under the usual conditions of

(A) Filtration (B) Reduction
(C) Oxidation (D) Denaturation

559. Insulin is oxidized to separate the protein molecule into its constituent polypeptide chains without affecting the other part of the molecule by the use of

(A) Performic acid (B) Oxalic acid
(C) Citric acid (D) Malic acid

560. Each hydrogen bond is quite

(A) Weak (B) Strong
(C) Both (A) and (B) (D) None of these

561. A coiled structure in which peptide bonds are folded in regular manner by

(A) Globular proteins (B) Fibrous proteins
(C) Both (A) and (B) (D) None of these

562. In many proteins the hydrogen bonding produces a regular coiled arrangement called

(A) α-helix (B) β-helix
(C) Both (A) and (B) (D) None of these

563. Many globular proteins are stable in solution although they lack in

(A) Hydrogen bonds (B) Salt bonds
(C) Non-polar bonds (D) Disulphide bonds

564. Each turn of α-helix contains the number of amino acids

(A) 2.8 (B) 3.2
(C) 3.4 (D) 3.6

565. The distance travelled per turn of α-helix in nm is

(A) 0.34 (B) 0.44
(C) 0.54 (D) 0.64

566. α-helix is disrupted by certain amino acids like

(A) Proline (B) Arginine
(C) Histidine (D) Lysine

567. α-helix is stabilized by

(A) Hydrogen bonds (B) Disulphide bonds
(C) Salt bonds (D) Non-polar bonds

568. Foetal haemoglobin contains

(A) Two α and two γ chains
(B) Two β and two γ chains
(C) Both (A) and (B)
(D) None of these

569. When haemoglobin takes up oxygen there is a change in the structure due to the moving closer together of

(A) β-chains (B) β-chains
(C) γ-chains (D) α and γ chains

570. The hydrogen bonds in the secondary and tertiary structure of proteins are directly attacked by

(A) Salts (B) Alkalies
(C) Detergents (D) All of these

571. The hydrogen bonds between peptide linkages are interfered by

(A) Guanidine (B) Uric acid
(C) Salicylic acid (D) Oxalic acid

572. The digestability of certain denatured proteins by proteolytic enzymes

(A) Decreases (B) Increases
(C) Normal (D) None of these

573. The antigenic antibody functions of proteins by denaturation are frequently

(A) Not changed (B) Changed
(C) Both (A) and (B) (D) None of these

574. In case of severe denaturation of protein, there is

(A) Reversible denaturation
(B) Moderate reversible denaturation
(C) Irreversible denaturation
(D) None of these

575. When egg albumin is heated till it is coagulated, the secondary and tertiary structures of the proteins are completely lost resulting in a mixture of randomly arranged

(A) Dipeptide chains (B) Tripeptide chains
(C) Polypeptide chains (D) All of these

576. In glycoproteins the carbohydrate is in the form of disaccharide units, the number of units are

(A) 50–100 (B) 200–300
(C) 400–500 (D) 600–700

577. The milk protein in the stomach of the infants is digested by

(A) Pepsin (B) Trypsin
(C) Chymotrypsin (D) Rennin

578. *Achylia gastrica* is said to be when absence of

(A) Pepsin only (B) Both pepsin and HCl
(C) HCl only (D) All of these

579. The pH of gastric juice become low in

(A) Hemolytic anemia (B) Pernicious anemia
(C) Both (A) and (B) (D) None of these

580. In small intestine trypsin hydrolyzes peptide linkages containing

(A) Arginine (B) Histidine
(C) Serine (D) Aspartate

581. Chymotrypsin in the small intestine hydrolyzes peptide linkages containing

(A) Alanine (B) Pheynl alanine
(C) Valine (D) Methionine

582. Carboxy peptidase B in the small intestine hydrolyzes peptides containing

(A) Leucine (B) Isoleucine
(C) Arginine (D) Cysteine

583. The transport of amino acids regulated by active processes of different numbers:

(A) 1 (B) 2
(C) 3 (D) 4

584. The third active process for amino acids transport involves

(A) Acidic amino acids
(B) Basic amino acids
(C) Neutral amino acids
(D) Sulphur containing amino acids

585. The neutral amino acids for absorption need

(A) TPP (B) $B_6 - PO_4$
(C) NAD^+ (D) $NADP^+$

586. If one amino acid is fed excess, the absorption of another is

(A) Slightly accelerated
(B) Moderately accelerated
(C) Highly accelerated
(D) Retarded

587. Under normal conditions, food proteins are generally readily digested upto the present

(A) 67 to 73 (B) 74 to 81
(C) 82 to 89 (D) 90 to 97

588. By overheating the nutritional value of cereal proteins is

(A) Increased (B) Decreased
(C) Unchanged (D) None of these

589. More than half of the protein of the liver and intestinal mucosa are broken down and resynthesised in

(A) 10 days (B) 12 days
(C) 15 days (D) 18 days

590. The half-life of antibody protein is about

(A) 4 weeks (B) 3 weeks
(C) 2 weeks (D) 1 week

591. Protein anabolism is stimulated by

(A) ACTH (B) Testosterone
(C) Glucagon (D) Epinephrine

592. The metabolism of protein is integrated with that of carbohydrate and fat through

(A) Oxaloacetate (B) Citrate
(C) Isocitrate (D) Malate

593. The building up and breaking down of protoplasm are concerned with the metabolism of

(A) Carbohydrate (B) Lipid
(C) Protein (D) Minerals

594. The amino acids abstracted from the liver are not utilized for repair or special synthesis but are broken down to

(A) Keto acids (B) Sulphur dioxide
(C) Water (D) Ammonia

595. The unwanted amino acids abstracted from the tissues are either used up by the tissue or in the liver converted into

(A) Ammonia (B) Urea
(C) Ammonium salts (D) Uric acid

596. Amino acids provide the nitrogen for the synthesis of

(A) The bases of the phospholipids
(B) Uric acid
(C) Glycolipids
(D) Chondroitin sulphates

597. The metabolism of all proteins ingested over and above the essential requirements is called

(A) Exogenous metabolism
(B) Endogenous metabolism
(C) Both (A) and (B)
(D) None of these

598. Sulphur containing amino acids after catabolism produces a substance which is excreted:

(A) SO_2 (B) HNO_3
(C) H_2SO_4 (D) H_3PO_4

599. Ethereal sulphate is synthesized from the _____ amino acid.

(A) Neutral (B) Acidic
(C) Basic (D) Sulphur containing

600. The amino acids required for creatine formation:

(A) Glycine (B) Arginine
(C) Methionine (D) All of these

601. In human and other ureotelic organisms, the end product of amino acid nitrogen metabolism:

(A) Bile acids (B) Ketone bodies
(C) Urea (D) Barium sulphate

602. The end product of amino acid nitrogen metabolism in uricotelic organisms (reptiles and birds) is

(A) Bilirubin (B) Urea
(C) Uric acid (D) Biliverdin

603. The transaminase activity needs the coenzyme:

(A) ATP (B) $B_6 - PO_4$
(C) FAD^+ (D) NAD^+

604. Transamination is a

(A) Irreversible process (B) Reversible process
(C) Both (A) and (B) (D) None of these

605. Most amino acids are substrates for transamination except

(A) Alanine (B) Threonine
(C) Serine (D) Valine

606 Oxidative conversion of many amino acids to their corresponding -ketoacids occurs in mammalian:

(A) Liver and kidney (B) Adipose tissue
(C) Pancreas (D) Intestine

607. The α-ketoacid is decarboxylated by H_2O_2 forming a carboxylic acid with one carbon atom less in the absence of the enzyme:

(A) Catalase (B) Decarboxylase
(C) Deaminase (D) Phosphatase

608. The activity of mammalian L-amino acid oxidase, an FMN – flavo protein, is quite

(A) Slow (B) Rapid
(C) Both (A) and (B) (D) None of these

609. From dietary protein as well as from the urea present in fluids secreted into the gastrointestinal tract intestinal bacteria produce

(A) Carbondioxide
(B) Ammonia
(C) Ammonium sulphate
(D) Creatine

610. The symptom of ammonia intoxication includes

(A) Blurring of vision (B) Constipation
(C) Mental confusion (D) Diarrhoea

611. Ammonia intoxication symptoms occur when brain ammonia levels are

(A) Slightly diminished (B) Highly diminished
(C) Increased (D) All of these

612. Ammonia production by the kidney is depressed in

(A) Acidosis (B) Alkalosis
(C) Both (A) and (B) (D) None of these

613. Ammonia is excreted as ammonium salts during metabolic acidosis but the majority is excreted as

(A) Phosphates (B) Creatine
(C) Uric acid (D) Urea

614. Synthesis of glutamine is accompanied by the hydrolysis of

(A) ATP (B) ADP
(C) TPP (D) Creatin phosphate

615. In brain, the major metabolism for removal of ammonia is the formation of

(A) Glutamate (B) Aspartate
(C) Asparagine (D) Glutamine

616. Carbamoyl phosphate synthetase structure is marked by change in the presence of

(A) N-Acetyl glutamate
(B) N-Acetyl Aspartate
(C) Neuraminic acid
(D) Oxalate

617. The biosynthesis of Urea occurs mainly in the Liver:

(A) Cytosol
(B) Microsomes
(C) Nucleus
(D) Mitochondria

618. One mol. of Urea is synthesized at the expense of the _____ mols. of ATP.

(A) 2 (B) 3
(C) 4 (D) 5

619. Urea biosynthesis occurs mainly in the liver involving the number of amino acids:

(A) 3 (B) 4
(C) 5 (D) 6

620. The normal daily output of Urea through urine in grams:

(A) 10 to 20 (B) 15 to 25
(C) 20 to 30 (D) 25 to 35

621. In severe acidosis, the output of urea is

(A) Decreased (B) Slightly increased
(C) Highly increased (D) Moderately increased

622. Uremia occurs in

(A) Cirrhosis of the liver (B) Nephritis
(C) Diabetes mellitus (D) Coronary thrombosis

623. Clinical symptom in urea cycle disorder is

(A) Mental retardation (B) Drowsiness
(C) Diarrhoea (D) Oedema

624. The sparing action of methionine is

(A) Tyrosine (B) Cystine
(C) Arginine (D) Tryptophan

625. NH^+_4 aminates glutamate to form glutamine requiring ATP and

(A) K^+ (B) Na^+
(C) Ca^{++} (D) Mg^{++}

626. Glutathione is a

(A) Dipeptide (B) Tripeptide
(C) Polypeptide (D) None of these

627. All following are conjugated proteins except

(A) Nucleoproteins (B) Proteoses
(C) Metalloproteins (D) Flavoproteins

628. All α-amino acids have one asymmetric carbon atom except

(A) Arginine (B) Glycine
(C) Aspartic acid (D) Histidine

629. Number of amino acids present in plants, animals and microbial proteins:

(A) 20 (B) 80
(C) 150 (D) 200

630. Hydrated density of (HD) lipoproteins is

(A) 0.94 gm/ml
(B) 0.94-1.006 gm/ml
(C) 1.006-1.063 gm/ml
(D) 1.063-1.21 gm/l

631. The bond in proteins that is not broken under usual conditions of denaturation:

(A) Hydrophobic bond (B) Hydrogen bond
(C) Disulphide bond (D) Peptide bonds

632. Plasma proteins act as

(A) Buffers (B) Immunoglobulins
(C) Reserve proteins (D) All of these

633. Group that reacts in the Biuret test:

(A) Peptide (B) Amino group
(C) Carboxylic group (D) Aldehyde group

634. In nitroprusside test, amino acid cysteine produces a:

(A) Red colour (B) Blue colour
(C) Yellow colour (D) Purple colour

635. Protein present in hemoglobin has the structure known as

(A) Primary (B) Secondary
(C) Tertiary (D) Quarternary

636. *Isoelectric* pH of an amino acid is that pH at which it has a

(A) Positive charge (B) Negative charge
(C) Nil net charge (D) None of these

637. Albuminoids are similar to

(A) Albumin (B) Globulin
(C) Both (A) and (B) (D) None of these

638. Optical isomers of all aminoacids exist except

(A) Glycine (B) Arginine
(C) Alanine (D) Hydroxy proline

639. Proteins that constitute keratin, collagen and elastin in body are

(A) Protamines (B) Phosphol proteins
(C) Scleroproteins (D) Metaproteins

640. Systematic name of lysine is

(A) Amino acetic acid
(B) 2,6 diaminohexanoic acid
(C) Aminosuccinic acid
(D) 2-Aminopropanoic acid

641. Side chains of all following amino acids contain aromatic rings except

(A) Phenyl alanine (B) Alanine
(C) Tyrosine (D) Tryptophan

642. Abnormal chain of amino acids in sickle cell anaemia is

(A) Alpha chain (B) Beta chain
(C) Delta chain (D) Gama chain

643. Number of chains in globin part of normal Hb:

(A) 1 (B) 2
(C) 3 (D) 4

644. The PH of albumin is

(A) 3.6 (B) 4.7
(C) 5.0 (D) 6.1

645. Ninhydrin reaction gives a purple colour and evolves CO_2 with

(A) Peptide bonds (B) Histamine
(C) Ergothioneine (D) Aspargine

646. Denaturation of proteins involves breakdown of

(A) Secondary structure (B) Tertiary structure
(C) Quarternary structure (D) All of these

647. In denaturation of proteins, the bond which is not broken:

(A) Disulphide bond (B) Peptide bond
(C) Hydrogen bond (D) Ionic bond

648. The purity of an isolated protein can be tested by employing various methods.

(A) Solubility curve
(B) Molecular weight
(C) Ultra Centrifugation
(D) Immuno Ractivity
(E) All of these

649. More than one break in the line or in saturation curve indicates the following quality of protein.

(A) Non homogenity (B) Purity
(C) Homogeneity (D) None of these

650. A sharp moving boundary is obtained between the pure solvent and solute containing layer in

(A) Chromatography
(B) Immuno Reactivity
(C) Ultra Centrifugation
(D) Solubility curve

651. The antibodies raised against a pure protein will show only one sharp spike on this technique:

(A) Solubility curve
(B) Solvent precipitation
(C) Molecular weight determination
(D) Immuno electrophoresis

652. This technique takes the advantage of the fact that each protein has different pH at which it is electrically neutral i.e., its isoelectric pH:

(A) Isoelectric focussing
(B) Immunoel Ectro Phoresis
(C) Chromatography
(D) HPLC

653. The following technique makes use of the difference in net charges of proteins at a given pH:

(A) Thin layer chromatography
(B) Ion exchange chromatography
(C) High performance liquid chromatography
(D) Paper chromatography

654. The ratio of the distance moved by a compound to the distance moved by the solvent frent is known as its

(A) PI value (B) Linking number
(C) Rf value (D) Gold number

655. The movement of charged particles towards one of the electrodes under the influence of electrical current is

(A) Gel filtration
(B) Molecular sieving
(C) Gas liquid chromatography
(D) Electrophoresis

656. An anion exchange resin linked to cellulose backbone is

(A) DEAE cellulose (B) CM cellulose
(C) Sephadex (D) None of these

657. A cation exchange resin linked to cellulose backbone is

(A) CM-cellulose (B) DEAE cellulose
(C) Starch (D) Biogel

658. The sorting out of molecules according to size and shape may be adapted to protein purification in this technique:

(A) Adsorption chromatography
(B) Gel filtration chromatography
(C) Paper chromatography
(D) None of these

659. Frequently employed materials for the adsorption chromatography of proteins include

(A) High capacity supporting gel
(B) Starch blocks
(C) Calcium phosphate gel alumina gel and hydroxy apatite
(D) All of these

660. The solubility of most proteins is lowered at high salt concentrations is called as

(A) Salting in process (B) Salting out process
(C) Isoelectric focussing (D) None of these

661. Phenylalanine, ornithine and methionine are involved in the biogenesis of

(A) Lysergic acid (B) Reserpine
(C) L-Hyoscyamine (D) Papaverine

662. All the following diuretics inhibit the carbonic anhydrase except

(A) Acetazolamide (B) Bumetanide
(C) Furosemide (D) Ethacrynic acid

663. Protein is a polymer of

(A) Sugars (B) Phenols
(C) Amino acids (D) Carboxylic acids

664. All the following amino acids are optically active except

(A) Tryptophane (B) Phenylalanine
(C) Valine (D) Glycine

665. Proteinous substances which catalyze biochemical reactions are known as

(A) Activators (B) Catalysts
(C) Enzymes (D) Hormones

666. Insulin is a protein which controls

(A) Blood clotting (B) Metabolic pathway
(C) Digestion (D) Kreb's cycle

667. Proteins which are responsible for defence mechanism are called

(A) Antimetabolites (B) Antibodies
(C) Antimycins (D) Apoproteins

668. When the net charge on an amino acid is zero, the pH is maintained as?

(A) 4.5 (B) 11.2
(C) 7.0 (D) 9.1

669. Isoelectric point of amino acids is used for

(A) Crystallisation (B) Precipitation
(C) Solubility (D) Reactivity

670. Xanthoproteic test is positive in proteins containing

(A) Sulphur amino acids
(B) α-Amino acids
(C) Aromatic amino acids
(D) Aliphatic amino acids

671. All α-amino acids give positive

(A) Million's test (B) Biurete test
(C) Xanthproteic test (D) Ninhydrine test

672. N-terminal amino acids of a polypeptide are estimated by

(A) Edmann reaction (B) Sanger's reagent
(C) Formaldehyde test (D) Ninhydrine reaction

673. Million's test is positive for

(A) Phenylalanine (B) Glycine
(C) Tyrosine (D) Proline

674. Indole group of tryptophan responses positively to

(A) Glyoxylic acid (B) Schiff's reagent
(C) Biuret test (D) Resorcinol test

675. Guanidine group of argentine gives positive test with

(A) Lead acetate
(B) Sakaguchi reagent
(C) Tricholoroacetic acid
(D) Molisch's reagent

676. Thiol group of cysteine gives red colour with

(A) Sodium acetate
(B) Lead acetate
(C) Sodium nitroprusside
(D) Barfoed's reagent

677. Protein deficiency disease is known as

(A) Cushing's disease
(B) Fabry's disease
(C) Parkinson's disease
(D) Kwashiorkor and marasmus

678. A vegetable source of protein is

(A) Egg plant
(B) Soyabean
(C) Tree of the Heaven
(D) Devil's dung

679. Oxaloacetate is converted to aspartic acid by

(A) Reductase (B) Oxidase
(C) Transminase (D) Catalase

680. Deficiency of biotin results in decrease in

(A) Amino acid synthesis
(B) Lipid synthesis
(C) Kidney
(D) Fatty acid synthesis

681. The precursor of bile salts, sex hormones and vitamin D is

(A) Diosgenin (B) Cholesterol
(C) Campesterol (D) Ergosterol

682 Unsaturated fatty acids is known as

(A) Non-essential fatty acids
(B) Essential fatty acids
(C) Cerebrosides
(D) Phospholipids

683 Biuret test is specific for

(A) Two peptide linkage
(B) Phenolic group
(C) Imidazole ring
(D) None of these

684. Most of calcium is present in bone, but 2% present in soft tissue and the blood is called

(A) Calcinated blood (B) Solidified blood
(C) Physiological blood (D) Colloidal blood

685. Calcium present with protein is known as free while in salt form is called as

(A) Bound (B) Precipitated
(C) Solid (D) Polymorphs

686. The following ions help in enzymatic transfer of phosphate from ATP to pyruvic acid:

(A) Sodium (B) Calcium
(C) Magnesium (D) Potassium

687. International enzyme commission classifies enzymes into

(A) Three classes (B) Six classes
(C) Four classess (D) Ten classes

688. Michaelis – Menten equation is used to explain the effect of substrate concentration on

(A) Carbohydrate (B) Enzyme
(C) Lipid (D) Protein

689. The pH at which an enzyme has maximum activity is known as

(A) Isoelectric pH (B) Optimum pH
(C) Low pH (D) High pH

690. Degradation of proteins to amino acids, glucose from carbohydrates and fatty acids from lipids is known as

(A) Anabolism (B) Metabolism
(C) Catabolism (D) Cretinism

691. During glycolysis of glucose the energy liberated in the absence of oxygen is known as

(A) Oxygenesis
(B) Glyconeogenesis
(C) Glycogenolysis
(D) Anaerobic fermentation

692. Deficiency of urea cycle enzymes results into accumulation of citrulline argininosuccinate arginine in the liver resulting in increasing concentration of ..... in the blood.

(A) Calcium (B) Sodium
(C) Ammonia (D) Lipid

693. Accumulation of trytophan in blood is known as

(A) Pompe's disease (B) Wilson's disease
(C) Wolman's disease (D) Hartnup's disease

694. Lymphocytes are responsible for the formation of

(A) Serum (B) Plasma
(C) Antibody (D) Calcium

695. Platelets contain an enzyme which has important role in clotting in blood. This enzyme is known as

(A) Cholinesterase (B) Transaminase
(C) Decarboxylase (D) Thrombokinase

696. Treatment of pentoses with a concentrated mineral acid yields a cyclic aldehyde known as

(A) Pentaldehyde (B) Cyclopental
(C) Hexaldehyde (D) Furfural

697. Isoelectric pH is that pH at which protein is electrically:

(A) Neutral (B) Anionic
(C) Cationic (D) None of these

698. About 6.25 g of haemoglobin is produced and destroyed in the body each day and the total amount of haemoglobin in a normal healthy 70 kg weighing male adult is

(A) 250 g (B) 150 g
(C) 100 g (D) 70 g

699. Pancreatic juice contains all of the following except

(A) Trypsinogen (B) Lipase
(C) Cholecystokinin (D) Chymnotrypsinogen

700. The milk protein in the stomach in an adult is digested by

(A) Pepsin (B) Rennin
(C) HCl (D) Chymotrypsinogen

701. Carboxypeptidase, an enzyme of pancreatic juice, contains

(A) Mn (B) Zinc
(C) Magnesium (D) Manganese

702. The zymogen from trypsinogen of pancreatic juice is converted to active trypsin by

(A) Peisin (B) Enterocrinin
(C) Enterokinase (D) Rennin

703. Inactive zymogens are precursors of all the following gastrointestinal enzymes except

(A) Carboxypeptidase (B) Pepsin
(C) Amino peptidase (D) Chymotrypsin

704. Rennin acts on casein of milk in infants in presence of

(A) Mg^{++} (B) Zn^{++}
(C) Co^{++} (D) Ca^{++}

705. All the following are true about phenylketonuria except

(A) Deficiency of phenylalanine hydroxylase
(B) Mental retardation
(C) Increased urinary excretion of p-hydroxyphenyl pyruvic acid
(D) Decrease serotonin formation

706. Which of the amino acid produces a vasodilator on decarboxylation?

(A) Glutamin acid (B) Histidine
(C) Ornithine (D) Cysteine

707. Neutral amino acid is

(A) Leucine (B) Lysine
(C) Aspartic acid (D) Histidine

708. The amino acid containing hydroxy group:

(A) Glycine (B) Isoleucine
(C) Arginine (D) Thereonine

709. The amino acid which synthesizes many hormornes:

(A) Valine (B) Phenylalanine
(C) Alanine (D) Histidine

710. Insulin degradation of disulfide bond formation is effected by

(A) Pyruvate dehydrogenase
(B) Xylitol reductase
(C) Gutathione reductase
(D) Xanthine oxidase

711. A protein reacts with biuret reagent which indicates 2 or more

(A) Blood clotting (B) Peptide bond
(C) Disulphide bonds (D) Hydrophobic bonds

712. In many proteins the hydrogen bonding produces a regular coiled arrangement which is called as

(A) β-Helix (B) α-Helix
(C) Both (A) and (B) (D) Spiral

713. The milk protein in the stomach of the infants is digested by

(A) Pepsin (B) Trypsin
(C) Chymotrypsin (D) Rennin

714. Protein anabolism is stimulated by

(A) ACTH (B) Testosterone
(C) Glucagon (D) Epinephrine

715. The number of helices present in a collagen molecule is

(A) 1 (B) 2
(C) 3 (D) 4

716. Which bond is present in the primary structure of protein?

(A) Ester (B) Hydrogen
(C) Ionic bond (D) Peptide

717. Sakaguchi reaction is specific for

(A) Guanidine group (B) Phenolic group
(C) Carboxylic group (D) None of these

718. With the exception of glycine all amino acids found in protein are

(A) Isocitrate dehydrogenase
(B) Fumarase
(C) Succinate thiokinase
(D) ATPase

719 In protein structure the α-helix and β-pleated sheets are example of

(A) Primary structure (B) Secondary structure
(C) Tertiary structure (D) Quaternary structure

720. An essential amino acid in man is

(A) Proline (B) Threonine
(C) Asparagine (D) Tyrosine

721. An amino acid that does not form an α-helix is

(A) Asparagine (B) Tyrosine
(C) Tryptophan (D) Proline

722. The protein present in hair is

(A) Elastin (B) Prolamine
(C) Keratin (D) Gliadin

723. Plasma protein can be separated by

(A) Salting out with $(NH_4)_2SO_4$
(B) Ultracentrifugation
(C) Immuno electrophoresis
(D) All of these

724. RNA does not contain

(A) Uracil
(B) Adenine
(C) Hydroxy methyl cytosine
(D) Phosphate

725. In mammalian cells, ribosomal RNA is produced mainly in the

(A) Nucleus
(B) Nucleolus
(C) Ribosome
(D) Golgi apparatus

726. Which co-enzyme is not involved in oxidative decarboxylation of pyruvic acid?

(A) TPP (B) Mg^{++}
(C) Biotin (D) CoA-SH

727. A polymeric unit of starch which has a branched structure is

(A) Glucose (B) Amylopectin
(C) Isomaltose (D) Amylose

728 The repeating unit in hyaluronic acid is

(A) Glucuronic acid and Galactosamine
(B) Glucuronic acid are glucosamine
(C) Glucuronic acid and N-acetyl glucosamine
(D) Glucuronic acid and N-acetyl galactosamine

729 The repeating disaccharide unit in celluslose is

(A) Sucrose (B) Maltose
(C) Dextrose (D) Cellobiose

ANSWERS

1. A	2. A	3. A	4. A	5. A	6. A
7. A	8. A	9. A	10. D	11. B	12. A
13. A	14. C	15. C	16. B	17. B	18. C
19. B	20. C	21. B	22. A	23. B	24. D
25. A	26. C	27. B	28. B	29. A	30. A
31. C	32. B	33. D	34. B	35. C	36. A
37. B	38. C	39. C	40. B	41. B	42. A
43. B	44. C	45. C	46. A	47. A	48. B
49. D	50. A	51. A	52. A	53. D	54. A
55. B	56. A	57. C	58. B	59. C	60. A
61. B	62. A	63. D	64. C	65. D	66. C
67. A	68. D	69. A	70. A	71. C	72. B
73. A	74. B	75. A	76. A	77. D	78. D
79. A	80. A	81. C	82. A	83. C	84. D
85. C	86. B	87. B	88. A	89. A	90. A
91. A	92. B	93. C	94. D	95. A	96. A
97. A	98. D	99. A	100. A	101. D	102. D
103. D	104. D	105. A	106. A	107. A	108. C
109. D	110. A	111. A	112. A	113. A	114. B
115. D	116. C	117. A	118. A	119. D	120. C
121. B	122. B	123. A	124. A	125. A	126. A
127. B	128. C	129. A	130. A	131. B	132. C
133. A	134. A	135. A	136. A	137. C	138. A
139. A	140. D	141. C	142. A	143. C	144. B
145. A	146. B	147. B	148. B	149. D	150. A
151. A	152. B	153. C	154. C	155. B	156. C
157. D	158. D	159. C	160. C	161. B	162. D
163. A	164. D	165. C	166. B	167. D	168. D
169. C	170. C	171. D	172. B	173. A	174. D
175. D	176. C	177. B	178. B	179. A	180. A
181. C	182. C	183. B	184. C	185. B	186. C
187. D	188. A	189. B	190. D	191. C	192. C
193. B	194. C	195. D	196. B	197. D	198. C
199. B	200. B	201. C	202. D	203. C	204. C
205. D	206. C	207. D	208. B	209. A	210. D
211. C	212. A	213. C	214. A	215. C	216. D
217. B	218. D	219. B	220. B	221. C	222. D
223. C	224. C	225. C	226. D	227. C	228. D
229. C	230. A	231. C	232. D	233. D	234. D
235. C	236. B	237. A	238. D	239. B	240. D
241. B	242. B	243. C	244. A	245. B	246. A
247. C	248. D	249. B	250. C	251. C	252. A

253. D 254. D 255. D 256. B 257. D 258. B
259. D 260. D 261. D 262. D 263. D 264. B
265. A 266. B 267. B 268. D 269. B 270. D
271. C 272. B 273. C 274. C 275. D 276. B
277. B 278. D 279. C 280. D 281. A 282. D
283. B 284. C 285. A 286. D 287. B 288. B
289. D 290. B 291. D 292. C 293. D 294. D
295. B 296. C 297. B 298. C 299. B 300. C
301. A 302. B 303. B 304. C 305. B 306. B
307. A 308. A 309. C 310. D 311. B 312. D
313. D 314. C 315. B 316. D 317. B 318. B
319. D 320. B 321. A 322. B 323. D 324. A
325. B 326. B 327. A 328. C 329. B 330. D
331. C 332. D 333. C 334. B 335. C 336. B
337. C 338. A 339. A 340. C 341. D 342. B
343. A 344. B 345. C 346. B 347. B 348.B
349. B 350. B 351. C 352. C 353. B 354. C
355. D 356. D 357. C 358. B 359. D 360. D
361. B 362. B 363. D 364. B 365. D 366. D
367. A 368. C 369. A 370. A 371. D 372. B
373. B 374. D 375. A 376. B 377. A 378. B
379. D 380. B 381. D 382. D 383. D 384. D
385. C 386. A 387. A 388. B 389. C 390. D
391. D 392. D 393. D 394. D 395. C 396. B
397. D 398. B 399. B 400. A 401. B 402. A
403. B 404. C 405. D 406. D 407. B 408. B
409. B 410. D 411. B 412. B 413. C 414. C
415. D 416. C 417. B 418. C 419. A 420. D
421. D 422. A 423. C 424. D 425. D 426. C
427. D 428. D 429. A 430. B 431. D 432. A
433. B 434. A 435. A 436. A 437. B 438. B
439. C 440. D 441. C 442. C 443. B 444. D
445. C 446. B 447. D 448. C 449. C 450. C
451. C 452. D 453. A 454. A 455. B 456. C
457. D 458. C 459. A 460. C 461. B 462. A
463. A 464. C 465. C 466. D 467. B 468. A
469. A 470. D 471. C 472. B 473. A 474. B
475. B 476. D 477. C 478. C 479. B 480. D
481. C 482. B 483. C 484. B 485. B 486. C
487. C 488. D 489. B 490. B 491. C 492. C
493. B 494. A 495. B 496. B 497. A 498. C
499. D 500. D 501. C 502. C 503. C 504. C
505. B 506. A 507. D 508. B 509. A 510. C

511. B	512. D	513. D	514. A	515. A	516. C
517. A	518. D	519. A	520. D	521. A	522. D
523. C	524. B	525. D	526. A	527. B	528. A
529. A	530. B	531. D	532. D	533. B	534. A
535. B	536. A	537. B	538. D	539. C	540. A
541. C	542. C	543. A	544. D	545. D	546. B
547. D	548. A	549. A	550. B	551. D	552. B
553. A	554. B	555. A	556. C	557. B	558. D
559. A	560. A	561. A	562. A	563. D	564. D
565. C	566. A	567. A	568. A	569. A	570. B
571. A	572. A	573. B	574. C	575. C	576. D
577. D	578. B	579. B	580. A	581. B	582. C
583. C	584. C	585. B	586. D	587. D	588. B
589. A	590. C	591. B	592. A	593. C	594. D
595. B	596. A	597. A	598. C	599. D	600. D
601. C	602. C	603. B	604. B	605. B	606. A
607. A	608. A	609. B	610. A	611. C	612. B
613. D	614. A	615. D	616. A	617. D	618. B
619. D	620. C	621. A	622. B	623. A	624. B
625. D	626. B	627. B	628. B	629. D	630. B
631. D	632. D	633. A	634. A	635. D	636. C
637. A	638. A	639. C	640. B	641. B	642. B
643. D	644. B	645. D	646. D	647. B	648. C
649. A	650.C	651. D	652. A	653. B	654. C
655. D	656. A	657. A	658. B	659. C	660. B
661. A	662. D	663. C	664. D	665. C	666. B
667. B	668. C	669. B	670. C	671. D	672. A
673. C	674. A	675. B	676. C	677. D	678. B
679. C	680. D	681. B	682. B	683. A	684. C
685. A	686. D	687. B	688. B	689. B	690. C
691. D	692. C	693. D	694. C	695. D	696. D
697. A	698. D	699. C	700. A	701. B	702. C
703. C	704. D	705. C	706. B	707. A	708. D
709. B	710. C	711. B	712. B	713. D	714. B
715. C	716. D	717. A	718. B	719. B	720. B
721. D	722. C	723. D	724. C	725. B	726. C
727. B	728. C	729. D			

EXPLANATIONS FOR THE ANSWERS

12. A Albumin (mol. Wt. 69,000) is the major constituent of plasma proteins with a concentration 3.5–5.0 g/dl. It is exclusively synthesized by the liver. Plasma albumin performs osmotic, transport and nutritive function, besides the buffering action.

67. A Ceruloplasmin is a blue coloured, copper containing α^2–globulin. Its normal plasma concentration is around 30 mg/dl and it is decreased in Wilson's disease.

103. D Defects in clotting factors cause abnormalities in blood clotting. Hemophilia A (defect-antihemophilic factor *i.e.*, VII), hemophilia B or Christmas disease (defect-Christmas factor, *i.e.*, IX) are the major abnormalities known.

151. A Lysine, arginine, histidine. These are dibasic monocarboxylic acids.

212. A The amino acids which are never found in protein structure are collectively referred to as non-protein amino acids. However, the non-protein amino acids perform several biological functions. *e.g.*, ornithine, citrulline, thyroxine.

268. D Amino acids are divided into 3 groups based on their metabolic fats.

(a) *Glycogenic:* These amino acids can serve as precursors for the synthesis of glucose (or glycogen) *e.g.*, alanine, aspartate, glycine.

(b) *Ketogenic:* Fat can be synthesized from these amino acids *e.g.*, leucine, lysine.

(c) *Glycogenic or ketogenic:* The amino acids that can form glucose as well as fat *e.g.*, isoleucine, phenylalanine, lysine.

300. C Zwitterion (dipolar ion) is a hybrid molecule containing positive and negative ionic groups. Each amino acid has a characteristic pH (*e.g.*, leucine pH 6.0), at which it exists as zwitterions.

350. B Albumin/Globulin (A/G) ratio expresses their relation in the serum concentration. The normal A/G ratio is 1.2 to 1.5:1, taking the concentration of albumin and globulins respectively in the range of 3.5-5.0 g/dl and 2.5–3.5 g/dl. The A/G ratio is lowered either due to a decrease in albumin 9liver disease) or an increase in globulins (chronic infections).

421. D By salting out technique (using ammonium sulfate or sodium sulfate), the plasma proteins can be separated into 3 groups – albumin, globulins and fibrinogen. Electrophoresis is the most commonly employed analytical technique for the separation of plasma (serum) proteins. Paper or agar gel electrophoresis with veronal buffer (pH 8.6) separates plasma proteins into 5 distinct bands namely albumin, α_1 - α_2, β-and γ-globulins.

488. D Complement system is composed of about 20 plasma proteins that complement the functions of antibodies in defending the body from invading antigens. The complement system helps the body immunity by promoting phagocytosis, formation of antigen-antibody complexes and inflammatory reaction.

507. D Apolipoproteins or apoproteins are the (structural) protein components of lipoproteins and are closely involved in the metabolism of the later, *e.g.*, AI, AIII, B_{100}, C_1, CII

555. A The removal of amino group from the amino acids as ammonia is deamination. It may be oxidative or non-oxidative in nature. The NH_3 so liberated is used for synthesis or urea.

600. D The three amino acids glycine, arginine and methionine are required for creatine formation. Glycine combines

683. A Biuret test is answered by compounds containing two or more CO–NH groups i.e., peptide bonds. All protein and peptides possessing at least two peptide linkages i.e., tripeptide (with 3 amino acids) give positive biuret test. The principle of biuret test is conveniently used to detect the presence of proteins in biological fluids. The mechanism of biuret test is not clearly known. It is believed that the colour is due to the formation of a copper co-ordianated complex.

717. A Arginine, containing guanidine group, reacts with α-naphthol and alkaline hypobromite to form a red colour complex.

CHAPTER 4

FATS AND FATTY ACID METABOLISM

1. An example of a hydroxy fatty acid is

(A) Ricinoleic acid (B) Crotonic acid
(C) Butyric acid (D) Oleic acid

2. An example of a saturated fatty acid is

(A) Palmitic acid (B) Oleic acid
(C) Linoleic acid (D) Erucic acid

3. If the fatty acid is esterified with an alcohol of high molecular weight instead of glycerol, the resulting compound is

(A) Lipositol (B) Plasmalogen
(C) Wax (D) Cephalin

4. A fatty acid which is not synthesized in the body and has to be supplied in the diet is

(A) Palmitic acid (B) Lauric acid
(C) Linolenic acid (D) Palmitoleic acid

5. Essential fatty acid:

(A) Linoleic acid (B) Linolenic acid
(C) Arachidonic acid (D) All these

6. The fatty acid present in cerebrosides is

(A) Lignoceric acid (B) Valeric acid
(C) Caprylic acid (D) Behenic acid

7. The number of double bonds in arachidonic acid is

(A) 1 (B) 2
(C) 4 (D) 6

8. In humans, a dietary essential fatty acid is

(A) Palmitic acid (B) Stearic acid
(C) Oleic acid (D) Linoleic acid

9. A lipid containing alcoholic amine residue is

(A) Phosphatidic acid (B) Ganglioside
(C) Glucocerebroside (D) Sphingomyelin

10. Cephalin consists of

(A) Glycerol, fatty acids, phosphoric acid and choline
(B) Glycerol, fatty acids, phosphoric acid and ethanolamine
(C) Glycerol, fatty acids, phosphoric acid and inositol
(D) Glycerol, fatty acids, phosphoric acid and serine

11. In mammals, the major fat in adipose tissues is

(A) Phospholipid (B) Cholesterol
(C) Sphingolipids (D) Triacylglycerol

12. Glycosphingolipids are a combination of

(A) Ceramide with one or more sugar residues
(B) Glycerol with galactose
(C) Sphingosine with galactose
(D) Sphingosine with phosphoric acid

13. The importance of phospholipids as constituent of cell membrane is because they possess

(A) Fatty acids
(B) Both polar and nonpolar groups
(C) Glycerol
(D) Phosphoric acid

14. In neutral fats, the unsaponificable matter includes

(A) Hydrocarbons (B) Triacylglycerol
(C) Phospholipids (D) Cholsesterol

15. Higher alcohol present in waxes is

(A) Benzyl (B) Methyl
(C) Ethyl (D) Cetyl

16. Kerasin consists of

(A) Nervonic acid (B) Lignoceric acid
(C) Cervonic acid (D) Clupanodonic acid

17. Gangliosides are complex glycosphingolipids found in

(A) Liver (B) Brain
(C) Kidney (D) Muscle

18. Unsaturated fatty acid found in the cod liver oil and containing 5 double bonds is

(A) Clupanodonic acid
(B) Cervonic acid
(C) Elaidic acid
(D) Timnodonic acid

19. Phospholipid acting as surfactant is

(A) Cephalin (B) Phosphatidyl inositol
(C) Lecithin (D) Phosphatidyl serine

20. An oil which contains cyclic fatty acids and once used in the treatment of leprosy is

(A) Elaidic oil (B) Rapeseed oil
(C) Lanoline (D) Chaulmoogric oil

21. Unpleasant odours and taste in a fat (rancidity) can be delayed or prevented by the addition of

(A) Lead (B) Copper
(C) Tocopherol (D) Ergosterol

22. Gangliosides derived from glucosylceramide contain in addition one or more molecules of

(A) Sialic acid (B) Glycerol
(C) Diacylglycerol (D) Hyaluronic acid

23. 'Drying oil', oxidized spontaneously by atmospheric oxygen at ordinary temperature and forms a hard water proof material is

(A) Coconut oil (B) Peanut oil
(C) Rape seed oil (D) Linseed oil

24. Deterioration of food (rancidity) is due to presence of

(A) Cholesterol
(B) Vitamin E
(C) Peroxidation of lipids
(D) Phenolic compounds

25. The number of ml of N/10 KOH required to neutralize the fatty acids in the distillate from 5 gm of fat is called

(A) Reichert-Meissel number
(B) Polenske number
(C) Acetyl number
(D) Non volatile fatty acid number

26. Molecular formula of cholesterol is

(A) $C_{27}H_{45}OH$
(B) $C_{29}H_{47}OH$
(C) $C_{29}H_{47}OH$
(D) $C_{23}H_{41}OH$

27. The cholesterol molecule is

(A) Benzene derivative
(B) Quinoline derivative
(C) Steroid
(D) Straight chain acid

28. Salkowski test is performed to detect

(A) Glycerol (B) Cholesterol
(C) Fatty acids (D) Vitamin D

29. Palmitic, oleic or stearic acid ester of cholesterol used in manufacture of cosmetic creams is

(A) Elaidic oil (B) Lanoline
(C) Spermaceti (D) Chaulmoogric oil

30. Dietary fats after absorption appear in the circulation as

(A) HDL (B) VLDL
(C) LDL (D) Chylomicron

31. Free fatty acids are transported in the blood

(A) Combined with albumin
(B) Combined with fatty acid binding protein
(C) Combined with β-lipoprotein
(D) In unbound free salts

32. Long chain fatty acids are first activated to acetyl-CoA in

(A) Cytosol (B) Microsomes
(C) Nucleus (D) Mitochondria

33. The enzyme acyl-CoA synthase catalyses the conversion of a fatty acid of an active fatty acid in the presence of

(A) AMP (B) ADP
(C) ATP (D) GTP

34. Carnitine is synthesized from

(A) Lysine and methionine
(B) Glycine and arginine
(C) Aspartate and glutamate
(D) Proline and hydroxyproline

35. The enzymes of β-oxidation are found in

(A) Mitochondria (B) Cytosol
(C) Golgi apparatus (D) Nucleus

36. Long chain fatty acids penetrate the inner mitochondrial membrane

(A) Freely
(B) As acyl-CoA derivative
(C) As carnitine derivative
(D) Requiring Na dependent carrier

37. An important feature of Zellweger's syndrome is

(A) Hypoglycemia
(B) Accumulation of phytanic acid in tissues
(C) Skin eruptions
(D) Accumulation of C_{26}-C_{38} polyenoic acid in brain tissues

38. An important finding of Fabry's disease is

(A) Skin rash (B) Exophthalmos
(C) Hemolytic anemia (D) Mental retardation

39. Gaucher's disease is due to deficiency of the enzyme:

(A) Sphingomyelinase
(B) Glucocerebrosidase
(C) Galactocerbrosidase
(D) β-Galactosidase

40. Characteristic finding in Gaucher's disease is

(A) Night blindness
(B) Renal failure
(C) Hepatosplenomegaly
(D) Deafness

41. An important finding in Neimann-Pick disease is

(A) Leukopenia
(B) Cardiac enlargement
(C) Corneal opacity
(D) Hepatosplenomegaly

42. Fucosidosis is characterized by

(A) Muscle spasticity (B) Liver enlargement
(C) Skin rash (D) Kidney failure

43. Metachromatic leukodystrophy is due to deficiency of enzyme:

(A) α-Fucosidase (B) Arylsulphatase A
(C) Ceramidase (D) Hexosaminidase A

44. A significant feature of Tangier disease is

(A) Impairment of chylomicron formation
(B) Hypotriacylglycerolmia
(C) Absence of Apo-C-II
(D) Absence of Apo-C-I

45. A significant feature of Broad Beta disease is

(A) Hypocholesterolemia
(B) Hypotriacylglycerolemia
(C) Absence of Apo-D
(D) Abnormality of Apo-E

46. Neonatal tyrosinemia improves on administration of

(A) Thiamin (B) Riboflavin
(C) Pyridoxine (D) Ascorbic acid

47. Absence of phenylalanine hydroxylase causes

(A) Neonatal tyrosinemia
(B) Phenylketonuria
(C) Primary hyperoxaluria
(D) Albinism

48. Richner-Hanhart syndrome is due to defect in

(A) Tyrosinase
(B) Phenylalanine hydroxylase
(C) Hepatic tyrosine transaminase
(D) Fumarylacetoacetate hydrolase

49. Plasma tyrosine level in Richner-Hanhart syndrome is

(A) 1–2 mg/dL (B) 2–3 mg/dL
(C) 4–5 mg/dL (D) 8–10 mg/dL

50. Amount of phenylacetic acid excreted in the urine in phenylketonuria is

(A) 100–200 mg/dL (B) 200–280 mg/dL
(C) 290–550 mg/dL (D) 600–750 mg/dL

51. Tyrosinosis is due to defect in the enzyme:

(A) Fumarylacetoacetate hydrolase
(B) p-Hydroxyphenylpyruvate hydroxylase
(C) Tyrosine transaminase
(D) Tyrosine hydroxylase

52. An important finding in Histidinemia is

(A) Impairment of conversion of α-Glutamate to α-ketoglutarate
(B) Speech defect
(C) Decreased urinary histidine level
(D) Patients can not be treated by diet

53. An important finding in glycinuria is

(A) Excess excretion of oxalate in the urine
(B) Deficiency of enzyme glycinase
(C) Significantly increased serum glycine level
(D) Defect in renal tubular reabsorption of glycine

54. Increased urinary indole acetic acid is diagnostic of

(A) Maple syrup urine disease
(B) Hartnup disease
(C) Homocystinuia
(D) Phenylketonuria

55. In glycinuria daily urinary excretion of glycine ranges from

(A) 100–200 mg (B) 300–500 mg
(C) 600–1000 mg (D) 1100–1400 mg

56. An inborn error, maple syrup urine disease is due to deficiency of the enzyme:

(A) Isovaleryl-CoAhydrogenase
(B) Phenylalnine hydroxylase
(C) Adenosyl transferase
(D) α-Ketoacid decarboxylase

57. Maple syrup urine disease becomes evident in extra uterine life by the end of

(A) First week (B) Second week
(C) Third week (D) Fourth week

58. Alkaptonuria occurs due to deficiency of the enzyme:

(A) Maleylacetoacetate isomerase
(B) Homogentisate oxidase
(C) p-Hydroxyphenylpyruvate hydroxylase
(D) Fumarylacetoacetate hydrolase

59. An important feature of maple syrup urine disease is

(A) Patient can not be treated by dietary regulation
(B) Without treatment death, of patient may occur by the end of second year of life
(C) Blood levels of leucine, isoleucine and serine are increased
(D) Excessive brain damage

60. Ochronosis is an important finding of

(A) Tyrosinemia
(B) Tyrosinosis
(C) Alkaptonuria
(D) Richner Hanhart syndrome

61. Phrynoderma is a deficiency of

(A) Essential fatty acids (B) Proteins
(C) Amino acids (D) None of these

62. The percentage of linoleic acid in safflower oil is

(A) 73 (B) 57
(C) 40 (D) 15

63. The percentage of polyunsaturated fatty acids in soyabean oil is

(A) 62 (B) 10
(C) 3 (D) 2

64. The percentage of polyunsaturated fatty acids in butter is

(A) 60 (B) 37
(C) 25 (D) 3

65. Dietary fibre denotes

(A) Undigested proteins
(B) Plant cell components that cannot be digested by own enzymes
(C) All plant cell wall components
(D) All non digestible water insoluble polysaccharide

66. A high fibre diet is associated with reduced incidence of

(A) Cardiovascular disease
(B) C.N.S. disease
(C) Liver disease
(D) Skin disease

67. Dietary fibres are rich in

(A) Cellulose (B) Glycogen
(C) Starch (D) Proteoglycans

68. Minimum dietary fibre is found in

(A) Dried apricot (B) Peas
(C) Bran (D) Cornflakes

69. A bland diet is recommended in

(A) Peptic ulcer (B) Atherosclerosis
(C) Diabetes (D) Liver disease

70. A dietary deficiency in both the quantity and the quality of protein results in

(A) Kwashiorkar (B) Marasmus
(C) Xerophtalmia (D) Liver diseases

71. The deficiency of both energy and protein causes

(A) Marasmus (B) Kwashiorkar
(C) Diabetes (D) Beri-beri

72. Kwashiorkar is characterized by

(A) Night blindness (B) Edema
(C) Easy fracturability (D) Xerophthalmia

73. A characteristic feature of Kwashiorkar is

(A) Fatty liver
(B) Emaciation
(C) Low insulin lever
(D) Occurrence in less than 1 year infant

74. A characteristic feature of marasmus is

(A) Severe hypoalbuminemia
(B) Normal epinephrine level
(C) Mild muscle wasting
(D) Low insulin and high cortisol level

75. Obesity generally reflects excess intake of energy and is often associated with the development of

(A) Nervousness
(B) Non-insulin dependent diabetes mellitus
(C) Hepatitis
(D) Colon cancer

76. Atherosclerosis and coronary heart diseases are associated with the diet:

(A) High in total fat and saturated fat
(B) Low in protein
(C) High in protein
(D) High in carbohydrate

77. Cerebrovasular disease and hypertension is associated with

(A) High calcium intake
(B) High salt intake
(C) Low calcium intake
(D) Low salt intake

78. The normal range of total serum bilirubin is

(A) 0.2–1.2 mg/100 ml
(B) 1.5–1.8 mg/100 ml
(C) 2.0–4.0 mg/100 ml
(D) Above 7.0 mg/100 ml

79. The normal range of direct reacting (conjugated) serum bilirubin is

(A) 0–0.1 mg/100 ml
(B) 0.1–0.4 mg/100 ml
(C) 0.4–06 mg/100 ml
(D) 0.5–1 mg/100 ml

80. The normal range of indirect (unconjugated) bilirubin in serum is

(A) 0–0.1 mg/100 ml
(B) 0.1–0.2 mg/100 ml
(C) 0.2–0.7 mg/100 ml
(D) 0.8–1.0 mg/100 ml

81. Jaundice is visible when serum bilirubin exceeds

(A) 0.5 mg/100 ml (B) 0.8 mg/100 ml
(C) 1 mg/100 ml (D) 2.4 mg/100 ml

82. An increase in serum unconjugated bilirubin occurs in

(A) Hemolytic jaundice
(B) Obstructive jaundice
(C) Nephritis
(D) Glomerulonephritis

83. One of the causes of hemolytic jaundice is

(A) G-6 phosphatase deficiency
(B) Increased conjugated bilirubin
(C) Glucokinase deficiency
(D) Phosphoglucomutase deficiency

84. Increased urobilinogen in urine and absence of bilirubin in the urine suggests

(A) Obstructive jaundice
(B) Hemolytic jaundice
(C) Viral hepatitis
(D) Toxic jaundice

85. A jaundice in which serum alanine transaminase and alkaline phosphatase are normal is

(A) Hepatic jaundice
(B) Hemolytic jaundice
(C) Parenchymatous jaundice
(D) Obstructive Jaundice

86. Fecal stercobilinogen is increased in

(A) Hemolytic jaundice
(B) Hepatic jaundice
(C) Viral hepatitis
(D) Obstructive jaundice

87. Fecal urobilinogen is increased in

(A) Hemolytic jaundice
(B) Obstruction of biliary duct
(C) Extrahepatic gall stones
(D) Enlarged lymphnodes

88. A mixture of conjugated and unconjugated bilirubin is found in the circulation in

(A) Hemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) Post hepatic jaundice

89. Hepatocellular jaundice as compared to pure obstructive type of jaundice is characterized by

(A) Increased serum alkaline phosphate, LDH and ALT
(B) Decreased serum alkaline phosphatase, LDH and ALT
(C) Increased serum alkaline phosphatase and decreased levels of LDH and ALT
(D) Decreased serum alkaline phosphatase and increased serum LDH and ALT

90. Icteric index of an normal adult varies between

(A) 1–2 (B) 2–4
(C) 4–6 (D) 10–15

91. Clinical jaundice is present with an icteric index above

(A) 4 (B) 8
(C) 10 (D) 15

92. Normal quantity of urobilinogen excreted in the feces per day is about

(A) 10–25 mg (B) 50–250 mg
(C) 300–500 mg (D) 700–800 mg

93. Fecal urobilinogen is decreased in

(A) Obstruction of biliary duct
(B) Hemolytic jaundice
(C) Excess fat intake
(D) Low fat intake

94. A complete absence of fecal urobilinogen is strongly suggestive of

(A) Obstruction of bile duct
(B) Hemolytic jaundice
(C) Intrahepatic cholestasis
(D) Malignant obstructive disease

95. Immediate direct Vanden Bergh reaction indicates

(A) Hemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) Megalobastic anemia

96. The presence of bilirubin in the urine without urobilinogen suggests

(A) Obstructive jaundice
(B) Hemolytic jaundice
(C) Pernicious anemia
(D) Damage to the hepatic parenchyma

97. Impaired galactose tolerance test suggests

(A) Defect in glucose utilisation
(B) Liver cell injury
(C) Renal defect
(D) Muscle injury

98. Increased serum ornithine carabamoyl transferase activity is diagnostic of

(A) Myocardial infarction
(B) Hemolytic jaundice
(C) Bone disease
(D) Acute viral hepatitis

99. The best known and most frequently used test of the detoxicating functions of liver is

(A) Hippuric acid test
(B) Galactose tolerance test
(C) Epinephrine tolerance test
(D) Rose Bengal dye test

100. The ability of liver to remove a dye like BSP from the blood suggests a normal

(A) Excretory function
(B) Detoxification function
(C) Metabolic function
(D) Circulatory function

101. Removal of BSP dye by the liver involves conjugation with

(A) Thiosulphate
(B) Glutamine
(C) Cystein component of glutathione
(D) UDP glucuronate

102. Normal value of plasma total proteins varies between

(A) 3–4 gm/100ml (B) 6–8 gm/100ml
(C) 10–12 gm/100ml (D) 14–16 gm/100ml

103. A decrease in albumin with increased production of other unidentified proteins which migrate in β, γ region suggests

(A) Cirrhosis of liver
(B) Nephrotic syndrome
(C) Infection
(D) Chronic lymphatic leukemia

104. In increase in α_2-Globulin with loss of albumin in urine suggests

(A) Primary immune deficiency
(B) Nephrotic syndrome
(C) Cirrhosis of liver
(D) Multiple myeloma

105. The normal levels of prothrombin time is about

(A) 2 sec (B) 4 sec
(C) 14 sec (D) 10–16 sec

106. In obstructive jaundice prothrombin time

(A) Remains normal
(B) Decreases
(C) Responds to vit K and becomes normal
(D) Responds to vit K and increases

107. In parenhymatous liver disease the prothrombin time

(A) Remains normal (B) Increases
(C) Decreases (D) Responds to Vit K

108. Urea clearance test is used to determine the

(A) Glomerular filtration rate
(B) Renal plasma flow
(C) Ability of kidney to concentrate the urine
(D) Measurement of tubular mass

109. The formula to calculate maximum urea clearance is $\frac{U \times V}{B}$, where U denotes

(A) Concentration of urea in urine in gm/24 hr
(B) Concentration of urea in urine in mg/100 ml
(C) Concentration of urea in blood in mg/100 ml
(D) Volume of urine in ml/mt

110. Average maximum urea clearance is

(A) 30 ml (B) 50 ml
(C) 75 ml (D) 90 ml

111. The average normal value for standard urea clearance is

(A) 20 ml (B) 30 ml
(C) 40 ml (D) 54 ml

112. Urea clearance is lowered in

(A) Acute nephritis
(B) Pneumonia
(C) Early stage of nephritic syndrome
(D) Benign hypertension

113. Glomerular filtration rate can be measured by

(A) Endogenous creatinine clearance
(B) Para-aminohippurate test
(C) Addis test
(D) Mosenthal test

114. At normal levels of creatinine in the blood, this metabolite is

(A) Filtered at the glomerulus but not secreted nor reabsorbed by the tubule
(B) Secreted by the tubule
(C) Reabsorbed by the tubule
(D) Secreted and reabsorbed by tubule

115. The normal values for creatinine clearance varies from

(A) 20–40 ml/min (B) 40–60 ml/min
(C) 70–85 ml/min (D) 95–105 ml/min

116. Measurement of insulin clearance test is a measure of

(A) Glomerular filtration rate
(B) Filtration factor
(C) Renal plasma flow
(D) Tubular secretory mass

117. The polysaccharide insulin is

(A) Filtered at the glomerulus but neither secreted nor reabsorbed by the tubule
(B) Filtered at the glomerulus and secreted by the tubule
(C) Filtered at the glomerulus and reabsorbed by the tubule
(D) Filtered at the glomerulus, secreted and reabsorbed by the tubule

118. Normal insulin clearance is

(A) 40 ml/1.73 sqm (B) 60 ml/1.73 sqm
(C) 80 ml/1.73 sqm (D) 120 ml/1.73 sqm

119. Creatinine EDTA clearance is a test to measure

(A) Renal plasma flow
(B) Filtration fraction
(C) Glomerular filtration rate
(D) Tubular function

120. The end products of saponification:

(A) glycerol (B) acid
(C) soap (D) Both (A) and (C)

121. The normal PAH clearance for a surface area of 1.73 sqm. is

(A) 200 ml/min (B) 300 ml/min
(C) 400 ml/min (D) 574 ml/min

122. Para amino hippurate is

(A) Filtered at glomeruli and secreted by the tubules
(B) Filtered at glomeruli and not secreted by the tubules
(C) Filtered at glomeruli and reabsorbed completely
(D) Not removed completely during a single circulation of the blood through the kidney.

123. The Tm for PAH i.e the maximal secretory capacity of the tubule for PAH can be used to gavge the

(A) Extent of tubular damage

(B) Impairment of the capacity of the tubule to perform osmotic work
(C) Impairment of renal plasma flow
(D) Glomerular filtration rate

124. The normal Tm in mg/min/1.73 sqm for PAH is

(A) 20 (B) 40
(C) 60 (D) 80

125. The normal range of filtration factor in an adult is

(A) 0.10–0.15 (B) 0.16–0.21
(C) 0.25–0.30 (D) 0.35–0.40

126. The filtration factor tends to be normal in

(A) Early essential hypertension
(B) Malignant phase of hypertension
(C) Glomerulonephritis
(D) Acute nephritis

127. The filtration factor is increased in

(A) Glomerulonephritis
(B) Malignant phase of hypertension
(C) Early essential hypertension
(D) Acute nephritis

128. The filtration factor is decreased in

(A) Glomerulonephritis
(B) Early essential hypertension
(C) Malignant phase of hypertension
(D) Starvation

129. Excretion of phenolsulphanpthalein (PSP) reflects

(A) Glomerulonephritis
(B) Maximaltabular excretory capacity
(C) Filtration factor
(D) Renal plasma flow

130. Which of the following is a polyunsaturated fatty acid?

(A) Palmitic acid (B) Palmitoleic acid
(C) Linoleic acid (D) Oleic acid

131. Which of the following is omega-3 polyunsaturated fatty acid?

(A) Linoleic acid (B) α-Linolenic acid
(C) γ-Linolenic acid (D) Arachidonic acid

132. Triglycerides are

(A) Heavier than water
(B) Major constituents of membranes
(C) Non-polar
(D) Hydrophilic

133. Cerebronic acid is present in

(A) Glycerophospholipids
(B) Sphingophospholipids
(C) Galactosyl ceramide
(D) Gangliosides

134. Acylsphingosine is also known as

(A) Sphingomyelin (B) Ceramide
(C) Cerebroside (D) Sulphatide

135. The highest phospholipids content is found in

(A) Chylomicrons (B) VLDL
(C) LDL (D) HDL

136. The major lipid in chylomicrons is

(A) Triglycerides (B) Phospholipids
(C) Cholesterol (D) Free fatty acids

137. Number of carbon atoms in cholesterol is

(A) 17 (B) 19
(C) 27 (D) 30

138. The lipoprotein richest in cholesterol is

(A) Chylomicrons (B) VLDL
(C) LDL (D) HDL

139. The major storage form of lipids is

(A) Esterified cholesterol
(B) Glycerophospholipids
(C) Triglycerides
(D) Sphingolipids

140. Cerebonic acid is present in

(A) Triglycerides
(B) Cerebrosides
(C) Esterified cholestrol
(D) Sphingomyelin

141. The nitrogenous base in lecithin is

(A) Ethanolamine (B) Choline
(C) Serine (D) Betaine

142. All the following are omega-6-fatty acids except

(A) Linoleic acid (B) α-Linolenic acid
(C) γ-Linolenic acid (D) Arachidonic acid

143. All the following have 18 carbon atoms except

(A) Linoleic acid (B) Linolenic acid
(C) Arachidonic acid (D) Stearic acid

144. A 20-carbon fatty acid among the following is

(A) Linoleic acid (B) α-Linolenic acid
(C) β-Linolenic acid (D) Arachidonic acid

145. Triglycerides are transported from liver to extrahepatic tissues by

(A) Chylomicrons (B) VLDL
(C) HDL (D) LDL

146. Cholesterol is transported from liver to extrahepatic tissues by

(A) Chylomicrons (B) VLDL
(C) HDL (D) LDL

147. Elevated plasma level of the following projects against atherosclerosis:

(A) Chylomicrons (B) VLDL
(C) HDL (D) LDL

148. All the following amino acids are non-essential except

(A) Alanine (B) Histidine
(C) Cysteine (D) Proline

149. Sulphydryl group is present in

(A) Cysteine (B) Methionine
(C) Both (A) and (B) (D) None of these

150. Oligosaccharide-pyrophosphoryl dolichol is required for the synthesis of

(A) N-linked glycoproteins
(B) O-linked glycoproteins
(C) GPI-linked glycoproteins
(D) All of these

151. In N-linked glycoproteins, oligosaccharide is attached to protein through its

(A) Asparagine residue (B) Glutamine residue
(C) Arginine residue (D) Lysine residue

152. De hovo synthesis of fatty acids occurs in

(A) Cytosol (B) Mitochondria
(C) Microsomes (D) All of these

153. Acyl Carrier Protein contains the vitamin:

(A) Biotin (B) Lipoic acid
(C) Pantothenic acid (D) Folic acid

154. Which of the following is required as a reductant in fatty acid synthesis?

(A) NADH (B) NADPH
(C) $FADH_2$ (D) $FMNH_2$

155. Hepatic liponenesis is stimulated by:

(A) cAMP (B) Glucagon
(C) Epinephrine (D) Insulin

156. De novo synthesis of fatty acids requires all of the following except

(A) Biotin (B) NADH
(C) Panthothenic acid (D) ATP

157. Acetyl CoA carboxylase regulates fatty acid synthesis by which of the following mechanism?

(A) Allosteric regulation
(B) Covalent modification
(C) Induction and repression
(D) All of these

158. β-Oxidation of fatty acids requires all the following coenzymes except

(A) CoA (B) FAD
(C) NAD (D) NADP

159. Which of the following can be oxidized by β-oxidation pathway?

(A) Saturated fatty acids
(B) Monosaturated fatty acids
(C) Polyunsaturated fatty acids
(D) All of these

160. Propionyl CoA is formed on oxidation of

(A) Monounsaturated fatty acids
(B) Polyunsaturated fatty acids
(C) Fatty acids with odd number of carbon atoms
(D) None of these

161. An enzyme required for the synthesis of ketone bodies as well as cholesterol is

(A) Acetyl CoA carboxylase
(B) HMG CoA synthetase
(C) HMG CoA reductase
(D) HMG CoA lyase

162. Ketone bodies are synthesized in

(A) Adipose tissue (B) Liver
(C) Muscles (D) Brain

163. All the following statements about ketone bodies are true except

(A) Their synthesis increases in diabetes mellitus
(B) They are synthesized in mitchondria
(C) They can deplete the alkali reserve
(D) They can be oxidized in the liver

164. All the following statements about carnitine are true except

(A) It can be synthesised in the human body
(B) It can be synthesized from methionine and lysine
(C) It is required for transport of short chain fatty acids into mitochondria
(D) Its deficiency can occur due to haemodialysis

165. Which of the following can be synthesized in the human body if precurors are available?

(A) Oleic acid (B) Palmitoleic acid
(C) Arachidonic acid (D) All of these

166. All the following can be oxidized by β-oxidation except

(A) Palmitic acid
(B) Phytanic acid
(C) Linoleic acid
(D) Fatty acids having an odd number of carbon atoms

167. Anti-inflammatory corticosteroids inhibit the synthesis of

(A) Leukotrienes (B) Prostaglandins
(C) Thromboxanes (D) All of these

168. Diets having a high ratio of polyunsaturated: saturated fatty acids can cause

(A) Increase in serum triglycerides
(B) Decrease in serum cholesterol
(C) Decrease in serum HDL
(D) Skin lesions

169. Thromboxanes cause

(A) Vasodilation
(B) Bronchoconstriction
(C) Platelet aggregation
(D) All of these

170. Prostaglandins lower camp in

(A) Adipose tissue (B) Lungs
(C) Platelets (D) Adenohypophysis

171. Slow reacting Substance of Anaphylaxis is a mixture of

(A) Prostaglandins (B) Prostacyclins
(C) Thromboxanes (D) Leukotrienes

172. Dipalmitoyl lecithin acts as

(A) Platelet activating factor
(B) Second messenger for hormones
(C) Lung surfactant
(D) Anti-ketogenic compound

173. Reichert-Meissl number:

(A) 0.1 N KOH (B) 0.5 KOH
(C) 0.1 N NaOH (D) 0.5 NaOH

174. In glycerophospholipids, a polyunsaturated fatty acid is commonly attached to which of the following carbon atom of glycerol?

(A) Carbon 1 (B) Carbon 2
(C) Both (A) and (B) (D) None of these

175. Lysolecithin is formed from lecithin by removal of

(A) Fatty acid from position 1
(B) Fatty acid from position 2
(C) Phosphorylcholine
(D) Choline

176. Sphingosine is synthesized from

(A) Palmitoyl CoA and Choline
(B) Palmitoyl CoA and ethanolamine
(C) Palmitoyl CoA and serine
(D) Acetyl CoA and choline

177. For synthesis of sphingosine, all the following coenzymes are required except

(A) Pyridoxal phosphate
(B) NADPH
(C) FAD
(D) NAD

178. Cerebrosides contain all the following except

(A) Galactose (B) Sulphate
(C) Sphingosine (D) Fatty acid

179. Niemann-Pick disease results from deficiency of

(A) Ceramidase (B) Sphingomyelinase
(C) Arylsulphatase A (D) Hexosaminidase A

180. Chylomicron remnants are catabolised in

(A) Intestine (B) Adipose tissue
(C) Liver (D) Liver and intestine

181. VLDL remnant may be converted into

(A) VLDL (B) LDL
(C) HDL (D) Chylomicrons

182. Receptors for chylomicron remnants are

(A) Apo A specific (B) Apo B-48 specific
(C) Apo C specific (D) Apo E specific

183. LDL receptor is specific for

(A) Apo B-48 and Apo B 100
(B) Apo B-48 and Apo E
(C) Apo B-100 and Apo D
(D) Apo B-100 and apo D

184. Nascent HDL of intestinal origin lacks

(A) Apo A (B) Apo C
(C) Apo E (D) Apo C and Apo E

185. HDL is synthesized in

(A) Adipose tissue (B) Liver
(C) Intestine (D) Liver and intestine

186. Nascent HDL of intestinal origin acquires Apo C and Apo E from

(A) Chylomicrons
(B) VLDL
(C) LDL
(D) HDL of the hepatic origin

187. Heparin releasable hepatic lipase converts

(A) VLDL remnants into LDL
(B) Nascent HDL into HDL
(C) HDL_2 into HDL_3
(D) HDL_3 into HDL_2

188. Activated lecithin cholesterol acyl transferase is essential for the conversion of

(A) VLDL remnants into LDL
(B) Nascent HDL into HDL
(C) HDL_2 into HDL_3
(D) HDL_3 into HDL_2

189. Fatty liver may be caused by

(A) Deficiency of methionine
(B) Puromycin
(C) Chronic alcoholism
(D) All of these

190. Alcohol dehydrogenase converts ethanol into

(A) Acetyl CoA (B) Acetaldehyde
(C) Acetate (D) CO_2 and H_2O

191. Lipids are stored in the body mainly in the form of

(A) Phospholipids (B) Glycolipids
(C) Triglycerides (D) Fatty acids

192. Lipid stores are mainly present in

(A) Liver (B) Brain
(C) Muscles (D) Adipose tissue

193. Glycerol is converted into glycerol-3-phosphate by

(A) Thiokinase (B) Triokinase
(C) Glycerol kinase (D) All of these

194. In adipose tissue, glycerol-3-phosphate required for the synthesis of triglycerides comes mainly from

(A) Hydrolysis of pre-existing triglycerides
(B) Hydrolysis of phospholipids
(C) Dihydroxyacetone phosphate formed in glycolysis
(D) Free glycerol

195. Glycerol released from adipose tissue by hydrolysis of triglycerides is mainly

(A) Taken up by liver
(B) Taken up by extrahepatic tissues
(C) Reutilised in adipose tissue
(D) Excreted from the body

196. Free glycerol cannot be used for triglyceride synthesis in

(A) Liver (B) Kidney
(C) Intestine (D) Adipose tissue

197. Adipose tissue lacks

(A) Hormone-sensitive lipase
(B) Glycerol kinase
(C) cAMP-dependent protein kinase
(D) Glycerol-3-phosphate dehydrogenase

198. A digestive secretion that does not contain any digestive enzyme is

(A) Saliva (B) Gastric juice
(C) Pancreatic juice (D) Bile

199. Saliva contains a lipase which acts on triglycerides having

(A) Short chain fatty acids
(B) Medium chain fatty acids
(C) Long chain fatty acids
(D) All of these

200. Salivary lipase hydrolyses the ester bond at

(A) Position 1 of triglycerides
(B) Position 2 of triglycerides
(C) Position 3 of triglycerides
(D) All of these

201. Salivary lipase converts dietary triglycerides into

(A) Diglycerides and fatty acids
(B) Monoglycerides and fatty acids
(C) Glycerol and fatty acids
(D) All of these

202. Pancreatic lipase requires for its activity:

(A) Co-lipase (B) Bile salts
(C) Phospholipids (D) All of these

203. Pancreatic lipase converts triacylglycerols into

(A) 2, 3-Diacylglycerol
(B) 1-Monoacylglycerol
(C) 2-Monoacylglycerol
(D) 3-Monoacylglycerol

204. Oxidation of fatty acids occurs

(A) In the cytosol
(B) In the matrix of mitochondria
(C) On inner mitochondrial membrane
(D) On the microsomes

205. Activation of fatty acids requires all the following except

(A) ATP (B) Coenzyme A
(C) Thiokinase (D) Carnitine

206. Mitochondrial thiokinase acts on

(A) Short chain of fatty acids
(B) Medium chain fatty acids
(C) Long chain fatty acids
(D) All of these

207. Carnitine is required for the transport of

(A) Triglycerides out of liver
(B) Triglycerides into mitochondria
(C) Short chain fatty acids into mitochondria
(D) Long chain fatty acids into mitochondria

208. Carnitine acylcarnitine translocase is present

(A) In the inner mitochondrial membrane
(B) In the mitochondrial matrix
(C) On the outer surface of inner mitochondrial membrane
(D) On the inner surface of inner mitochondrial membrane

209. Net ATP generation on complete oxidation of stearic acid is

(A) 129 (B) 131
(C) 146 (D) 148

210. Propionyl CoA formed oxidation of fatty acids having an odd number of carbon atoms is converted into

(A) Acetyl CoA
(B) Acetoacetyl CoA
(C) D-Methylmalonyl CoA
(D) Butyryl CoA

211. α-Oxidation of fatty acids occurs mainly in

(A) Liver (B) Brain
(C) Muscles (D) Adipose tissue

212. Refsum's disease results from a defect in the following pathway except

(A) Alpha-oxidation of fatty acids
(B) Beta-oxidation of fatty acids
(C) Gamma-oxidation of fatty acids
(D) Omega-oxidation of fatty acids

213. The end product of omega-oxidation of fatty acids having an even number of carbon atoms is

(A) Adipic acid (B) Suberic acid
(C) Both (A) and (B) (D) None of these

214. De novo synthesis of fatty acids is catalysed by a multi-enzyme complex which contains

(A) One-SH group (B) Two-SH groups
(C) Three-SH groups (D) Four-SH groups

215. Fat depots are located in

(A) Intermuscular connective tissue
(B) Mesentary
(C) Omentum
(D) All of these

216. Salivary lipase is secreted by

(A) Parotid glands
(B) Sub-maxillary glands
(C) Dorsal surface of tongue
(D) None of these

217. Co-lipase is a

(A) Bile salt (B) Vitamin
(C) Protein (D) Phospholipid

218. Plasma becomes milky

(A) Due to high level of HDL
(B) Due to high level of LDL
(C) During fasting
(D) After a meal

219. Mitochondrial membrane is permeable to

(A) Short chain fatty acids
(B) Medium chain fatty acids
(C) Long chain fatty acids
(D) All of these

220. During each cycle of β-oxidation

(A) One carbon atom is removed from the carboxyl end of the fatty acid
(B) One carbon atom is removed from the methyl end of the fatty acid
(C) Two carbon atoms are removed from the carboxyl end of the fatty acid
(D) Two carbon atoms are removed from the methyl end of the fatty acid

221. Net generation of energy on complete oxidation of palmitic acid is

(A) 129 ATP equivalents
(B) 131 ATP equivalents
(C) 146 ATP equivalents
(D) 148 ATP equivalents

222. Net generation of energy on complete oxidation of a 17-carbon fatty acid is

(A) Equal to the energy generation from a 16-carbon fatty acid
(B) Equal to the energy generation from an 18-carbon fatty acid
(C) Less than the energy generation from a 16-carbon fatty acid
(D) In between the energy generation from a 16-carbon fatty acid and an 18-carbon fatty acid

223. Net energy generation on complete oxidation of linoleic acid is

(A) 148 ATP equivalents
(B) 146 ATP equivalents
(C) 144 ATP equivalents
(D) 142 ATP equivalents

224. Extramitochondrial synthesis of fatty acids occurs in

(A) Mammary glands (B) Lungs
(C) Brain (D) All of these

225. One functional sub-unit of multi-enzyme complex for de novo synthesis of fatty acids contains

(A) One —SH group
(B) Two —SH groups
(C) Three —SH groups
(D) Four —SH groups

226. NADPH required for fatty acid synthesis can come from

(A) Hexose monophosphate shunt
(B) Oxidative decarboxylation of malate
(C) Extramitochondrial oxidation of isocitrate
(D) All of these

227. Fatty liver may be prevented by all of the following except

(A) Choline (B) Betaine
(C) Methionine (D) Ethionine

228. Human desaturase enzyme system cannot introduce a double bond in a fatty acid beyond

(A) Carbon 9 (B) Carbon 6
(C) Carbon 5 (D) Carbon 3

229. Which of the following lipid is absorbed actively from intestines?

(A) Glycerol
(B) Cholesterol
(C) Monoacylglycerol
(D) None of these

230. C_{22} and C_{24}, fatty acids required for the synthesis of sphingolipids in brain are formed by

(A) De novo synthesis
(B) Microsomal chain elongation
(C) Mitochondrial chain elongation
(D) All of these

231. Sphingomyelins:

(A) Phospholipids (B) Nitrolipids
(C) Alcohols (D) None of these

232. All of the following statements about hypoglycin are true except

(A) It is a plant toxin
(B) It causes hypoglycaemia
(C) It inhibits oxidation of short chain fatty acids
(D) It inhibits oxidation of long chain fatty acids

233. Synthesis of prostaglandins is inhibited by

(A) Glucocorticoids (B) Aspirin
(C) Indomethacin (D) All of these

234. Lipo-oxygenase is required for the synthesis of

(A) Prostaglandins (B) Leukotrienes
(C) Thromboxanes (D) All of these

235. All of the following statements about multiple sclerosis are true except

(A) There is loss of phospholipids from white matter
(B) There is loss of sphingolipids from white matter
(C) There is loss of esterified cholesterol from white matter
(D) White matter resembles gray matter in composition

236. After entering cytosol, free fatty acids are bound to

(A) Albumin (B) Globulin
(C) Z-protein (D) None of these

237. Release of free fatty acids from adipose tissue is increased by all of the following except

(A) Glucagon (B) Epinephrine
(C) Growth hormone (D) Insulin

238. All the following statements about brown adipose tissue are true except

(A) It is rich in cytochromes
(B) It oxidizes glucose and fatty acids
(C) Oxidation and phosphorylation are tightly coupled in it
(D) Dinitrophenol has no effect on it

239. Lovastatin and mevastatin lower

(A) Serum triglycerides
(B) Serum cholesterol
(C) Serum phospholipids
(D) All of these

240. Lovastatin is a

(A) Competitive inhibitor of acetyl CoA carboxylase
(B) Competitive inhibitor of HMG CoA synthetase
(C) Non-competitive inhibitor of HMG CoA reductase
(D) Competitive inhibitor of HMG CoA reductase

241. Abetalipoproteinaemia occurs due to a block in the synthesis of

(A) Apoprotein A (B) Apoprotein B
(C) Apoprotein C (D) Cholesterol

242. All of the following statements about Tangier disease are true except

(A) It is a disorder of HDL metabolism
(B) Its inheritance is autosomal recessive
(C) Apoproteins A-I and A-II are not synthesised
(D) Plasma HDL is increased

243. Genetic deficiency of lipoprotein lipase causes hyperlipoproteinaemia of following type:

(A) Type I (B) Type IIa
(C) Type IIb (D) Type V

244. Chylomicrons are present in fasting blood samples in hyperlipoproteinaemia of following types:

(A) Types I and IIa (B) Types IIa and IIb
(C) Types I and V (D) Types IV and V

245. Glutathione is a constituent of

(A) Leukotriene A_4 (B) Thromboxane A_1
(C) Leukotriene C_4 (D) None of these

246. Prostaglandins are inactivated by

(A) 15-Hydroxyprostaglandin dehydrogenase
(B) Cyclo-oxygenase
(C) Lipo-oxygenase
(D) None of these

247. Phenylbutazone and indomethacin inhibit

(A) Phospholipase A_1 (B) Phospholipase A_2
(C) Cyclo-oxygenase (D) Lipo-oxygenase

248. Prostaglandins stimulate

(A) Aggregation of platelets
(B) Lipolysis in adipose tissue
(C) Bronchodilatation
(D) Gastric acid secretion

249. For extramitochondrial fatty acid synthesis, acetyl CoA may be obtained from

(A) Citrate (B) Isocitrate
(C) Oxaloacetate (D) Succinate

250. Fluidity of membranes is increased by the following constituent except

(A) Polyunsaturated fatty acids
(B) Saturated fatty acids
(C) Integral proteins
(D) Cholesterol

251. Transition temperature of membranes may be affected by the following constituent of membranes:

(A) Peripheral proteins (B) Integral proteins
(C) Cholesterol (D) Oligosachharides

252. Acetyl CoA formed from pyruvate can be used for the synthesis of all the following except

(A) Glucose (B) Fatty acids
(C) Cholesterol (D) Steroid hormones

253. Which of the following can be used as a source of energy in extrahepatic tissues?

(A) Acetoacetate (B) Acetone
(C) Both (A) and (B) (D) None of these

254. Anti-inflammatory corticosteroids inhibit

(A) Phospholipase A_1 (B) Phospholipase A_2
(C) Cyclo-oxygenase (D) Lipo-oxygenase

255. Cyclo-oxygenase is involved in the synthesis of

(A) Prostaglandins (B) Thromboxanes
(C) Both (A) and (B) (D) None of these

256. Leukotrienes cause

(A) Increase in capillary permeability
(B) Aggregation of platelets
(C) Bronchodilatation
(D) None of these

257. Prostaglandins decrease all of the following except

(A) Gastric acid secretion
(B) Blood pressure
(C) Uterine contraction
(D) Platelet aggregation

258. Hypocholesterolaemia can occur in

(A) Hyperthyroidism
(B) Nephrotic syndrome
(C) Obstructive jaundice
(D) Diabetes mellitus

259. De novo synthesis and oxidation of fatty acids differ in the following respect:

(A) Synthesis occurs in cytosol and oxidation in mitochondria
(B) Synthesis is decreased and oxidation increased by insulin
(C) NADH is required in synthesis and FAD in oxidation
(D) Malonyl CoA is formed during oxidation but not during synthesis

260. Free fatty acids released from adipose tissue are transported in blood by

(A) Albumin (B) VLDL
(C) LDL (D) HDL

261. β -Galactosidase is deficient in

(A) Fabry's disease
(B) Krabbe's disease
(C) Gaucher's disease
(D) Metachromatic leukodystrophy

262. The enzyme deficient in metachromatic leukodystrophy is

(A) Arylsulphatase A (B) Hexosaminidase A
(C) Ceramidase (D) Sphingomyelinase

263. All of the following statements about generalized gangliosidosis are true except

(A) It results from deficiency of G_{M1}-β-Gangliosidase
(B) Breakdown of G_{M1} ganglioside is impaired
(C) G_{M2} ganglioside accumulates in liver and elsewhere
(D) It leads to mental retardation

264. Hexosaminidase A is deficient in

(A) Tay-Sachs disease
(B) Gaucher's disease
(C) Niemann-Pick disease
(D) Fabry's disease

265. Mental retardation occurs in

(A) Tay-Sachs disease
(B) Gaucher's disease
(C) Niemann-Pick disease
(D) All of these

266. The enzyme deficient in Fabry's disease is

(A) α-Galactosidase (B) β-Galactosidase
(C) α-Glucosidase (D) β-Glucosidase

267. Highest protein content amongst the following is present in

(A) Wheat (B) Rice
(C) Pulses (D) Soyabean

268. Daily protein requirement of an adult man is

(A) 0.5 gm/kg of body weight
(B) 0.8 gm/kg of body weight
(C) 1.0 gm/kg of body weight
(D) 1.5 gm/kg of body weight

269. Daily protein requirement of an adult woman is

(A) 0.5 gm/kg of body weight
(B) 0.8 gm/kg of body weight
(C) 1.0 gm/kg of body weight
(D) 1.5 gm/kg of body weight

270. Cysteine can partially meet the requirement of

(A) Phenylalanine (B) Threonine
(C) Methionine (D) None of these

271. Invisible fat is present in

(A) Milk (B) Coconut oil
(C) Groundnut oil (D) Hydrogenated oils

272. Visible fat is present in

(A) Milk (B) Pulses
(C) Coconut oil (D) Egg yolk

273. Fat content of eggs is about

(A) 7% (B) 10%
(C) 13% (D) 16%

274. Fat content of pulses is about

(A) 5% (B) 10%
(C) 15% (D) 20%

275. Predominant fatty acids in meat are

(A) Saturated
(B) Monounsaturated
(C) Polyunsaturated
(D) Mono and poly-unsaturated

276. Oils having more than 50 % polyunsaturated fatty acids include all of the following except

(A) Groundnut oil (B) Soyabean oil
(C) Sunflower oil (D) Safflower oil

277. Cholesterol is present in all of the following except

(A) Egg (B) Fish
(C) Milk (D) Pulses

278. Which of the following has the highest cholesterol content?

(A) Meat (B) Fish
(C) Butter (D) Milk

279. Which of the following has the highest cholesterol content?

(A) Egg yolk (B) Egg white
(C) Meat (D) Fish

280. The following contains the least cholesterol:

(A) Milk (B) Meat
(C) Butter (D) Cheese

281. Which of the following constitutes fibre or roughage in food?

(A) Cellulose (B) Pectin
(C) Inulin (D) All of these

282. The starch content of wheat is about

(A) 50% (B) 60%
(C) 70% (D) 80%

283. The starch content of pulses is about

(A) 50% (B) 60%
(C) 70% (D) 80%

284. A significant source of starch among vegetables is

(A) Radish (B) Spinach
(C) Potato (D) Cauliflower

285. The cyclic ring present in all the steroids:

(A) Cyclopentano perhydrophenanthrene
(B) Nitropentano
(C) both (A) and (B)
(D) None of these

286. In Ames' assay, addition of a carcinogen to the culture medium allows S. typhimurium to grow

(A) In the presence of histidine
(B) In the presence of arginine
(C) In the absence of histidine
(D) In the absence of arginine

287. In Ames' assay, liver homogenate is included in the culture medium because

(A) It converts pro-carcinogens into carcinogens
(B) Liver can metabolise histidine
(C) *Salmonella* mainly infects liver
(D) Liver is very susceptible to cancer

288. Bile pigments are present and urobilinogen absent in urine in

(A) Haemolytic jaundice
(B) Hepatocellular jaundice
(C) Obstructive jaundice
(D) Crigler-Najjar syndrome

289. Bile pigments are absent and urobilinogen increased in urine in

(A) Haemolytic jaundice
(B) Hepatocellular jaundice
(C) Obstructive jaundice
(D) Rotor's syndrome

290. In obstructive jaundice, urine shows

(A) Absence of bile pigments and urobilinogen
(B) Presence of bile pigments and urobilinogen
(C) Absence of bile pigments and presence of urobilinogen
(D) Presence of bile pigments and absence of urobilinogen

291. In haemolytic jaundice, urine shows

(A) Absence of bile pigments and urobilinogen
(B) Presence of bile pigments and urobilinogen
(C) Absence of bile pigments and presence of urobilinogen
(D) Presence of bile pigments and absence of urobilinogen

292. Serum albumin may be decreased in

(A) Haemolytic jaundice
(B) Hepatocellular jaundice
(C) Obstructive jaundice
(D) All of these

293. Normal range of serum albumin is

(A) 2.0–3.6 gm/dl (B) 2.0–3.6 mg/dl
(C) 3.5–5.5 gm/dl (D) 3.5–5.5 mg/dl

294. Normal range of serum globulin is

(A) 2.0–3.6 mg/dl (B) 2.0–3.6 gm/dl
(C) 3.5–5.5 mg/dl (D) 3.5–5.5 gm/dl

295. Serum albumin: globulin ratio is altered in

(A) Gilbert's disease (B) Haemolytic jaundice
(C) Viral hepatitis (D) Stones in bile duct

296. Esterification of cholesterol occurs mainly in

(A) Adipose tissue (B) Liver
(C) Muscles (D) Kidneys

297. Galactose intolerance can occur in

(A) Haemolytic jaundice
(B) Hepatocellular jaundice
(C) Obstructive jaundice
(D) None of these

298. Prothrombin is synthesised in

(A) Erythrocytes
(B) Reticulo-endothelial cells
(C) Liver
(D) Kidneys

299. Prothrombin time remains prolonged even after parenterals administration of vitamin K in

(A) Haemolytic jaundice
(B) Liver damage
(C) Biliary obstruction
(D) Steatorrhoea

300. All the following statements about obstructive jaundice are true except

(A) Conjugated bilirubin in serum is normal
(B) Total bilirubin in serum is raised
(C) Bile salts are present in urine
(D) Serum alkaline phosphatase is raised

301. All the following statements about obstructive jaundice are true except

(A) Prothrombin time may be prolonged due to impaired absorption of vitamin K
(B) Serum alkaline phosphatase may be raised due to increased release of the enzyme from liver cells
(C) Bile salts may enter systemic circulation due to biliary obstruction
(D) There is no defect in conjugation of bilirubin

302. A test to evaluate detoxifying function of liver is

(A) Serum albumin: globulin ratio
(B) Galactose tolerance test
(C) Hippuric acid test
(D) Prothrombin time

303. Hippuric acid is formed from

(A) Benzoic acid and alanine
(B) Benzoic acid glycine
(C) Glucuronic acid and alanine
(D) Glucuronic acid and glycine

304. An enzyme which is excreted in urine is

(A) Lactase dehydrogenase
(B) Amylase
(C) Ornithine transcarbamoylase
(D) None of these

305. Serum gamma glutamyl transpeptidase is raised in

(A) Haemolytic jaundice
(B) Myocardial infarction
(C) Alcoholic hepatitis
(D) Acute cholecystitis

306. Oliguria can occur in

(A) Diabetes mellitus
(B) Diabetes insipidus
(C) Acute glomerulonephritis
(D) Chronic glomerulonephritis

307. Urea clearance is the

(A) Amount of urea excreted per minute
(B) Amount of urea present in 100 ml of urine
(C) Volume of blood cleared of urea in one minute
(D) Amount of urea filtered by glomeruli in one minute

308. Inulin clearance is a measure of

(A) Glomerular filtration rate
(B) Tubular secretion flow
(C) Tubular reabsorption rate
(D) Renal plasma flow

309. Phenolsulphonephthalein excretion test is an indicator of

(A) Glomerular filtration
(B) Tubular secretion
(C) Tubular reabsorption
(D) Renal blood low

310. Para-amino hippurate excretion test is an indicator of

(A) Glomerular filtration
(B) Tubular secretion
(C) Tubular reabsorption
(D) Renal plasma flow

311. Renal plasma flow of an average adult man is

(A) 120–130 ml/minute
(B) 325–350 ml/minute
(C) 480–52 ml/minute
(D) 560–830 ml/minute

312. Filtration fraction can be calculated from

(A) Standard urea clearance and PSP excretion
(B) Maximum urea clearance and PSP excretion
(C) Maximum urea clearance and PAH clearance
(D) Inulin clearance and PAH clearance

313. Normal filtration fraction is about

(A) 0.2 (B) 0.4
(C) 0.6 (D) 0.8

314. Filtration fraction is increased in

(A) Acute glomerulonephritis
(B) Chronic glomerulonephritis
(C) Hypertension
(D) Hypotension

315. Among the following, a test of Glomerular function is

(A) Urea clearance
(B) PSP excretion test
(C) PAH clearance
(D) Hippuric acid excretion test

316. Esters of fatty acids with higher alcohols other than glycerol are said to be

(A) Waxes (B) Fats
(C) Both (A) and (B) (D) None of these

317. The combination of an amino alcohol, fatty acid and sialic acid form

(A) Phospholipids (B) Sulpholipids
(C) Glycolipids (D) Aminolipids

318. Hydrolysis of fats by alkali is called

(A) Saponification number
(B) Saponification
(C) Both (A) and (B)
(D) None of these

319. The number of milliliters of 0.1 N KOH required to neutralize the insoluble fatty acids from 5 gms of fat is called

(A) Acid number (B) Acetyl number
(C) Halogenation (D) Polenske number

320. The rate of fatty acid oxidation is increased by

(A) Phospholipids (B) Glycolipids
(C) Aminolipids (D) All of these

321. Lecithin contains a nitrogenous base named as

(A) Ethanolamine (B) Choline
(C) Inositol (D) All of these

322. Lecithins contain an unsaturated fatty acid at position:

(A) α (B) α and β
(C) β (D) None of these

323. Lecithins are soluble in ordinary solvents except

(A) Benzene (B) Ethyl alcohol
(C) Methyl alcohol (D) Acetone

324. Lecithins combine with protein to form

(A) Phosphoprotein (B) Mucoprotein
(C) Lipoprotein (D) Glycoprotein

325. Instead of ester link plasmalogens possess an other link in position:

(A) α (B) β
(C) γ (D) None of these

326. The alkyl radical in plasmalogen is an alcohol:

(A) Saturated (B) Unsaturated
(C) Both (A) and (B) (D) None of these

327. The concentration of sphingomyelins are increased in

(A) Gaucher's disease
(B) Fabry's disease
(C) Fabrile disease
(D) Niemann-Pick disease

328. Sphingomyelins contain a complex amino alcohol named as

(A) Serine (B) Lysolecithin
(C) Sphingosine (D) Glycol

329. The types of sphingomyelins are

(A) 1 (B) 3
(C) 4 (D) 5

330. Glycolipids contain an amino alcohol:

(A) Sphingosine (B) Iso-sphingosine
(C) Both (A) and (B) (D) None of these

331. Cerebrosides may also be classified as

(A) Sphingolipids (B) Sulpholipids
(C) Aminolipids (D) Glycolipids

332. Gaucher's disease is characterized specially by the increase in

(A) Lignoceric acid
(B) Nervonic acid
(C) Cerebomic acid
(D) Hydroxynervonic acid

333. Gangliosides are the glycolipids occurring in

(A) Brain (B) Liver
(C) Kidney (D) Muscle

334. Lipoprotein present in cell membrane is by nature:

(A) Hydrophilic (B) Hydrophobic
(C) Both (A) and (B) (D) None of these

335. The density of lipoproteins increases as the protein content

(A) Increases
(B) Decreases
(C) Highly decreases
(D) Slightly and promptly decreases

336. Lipoprotiens may be identified more accurately by means of

(A) Electrophoresis
(B) Ultra centrifugation
(C) Centrifugation
(D) Immunoelectrophoresis

337. Very low density lipoproteins are also known as

(A) β-lipoproteins (B) Pre β–lipoproteins
(C) α-lipoproteins (D) None of these

338. The protein moiety of lipoprotein is known as

(A) Apoprotein (B) Pre-protein
(C) Post-protein (D) Pseudoprotein

339. The β-lipoprotein fraction increases in severe

(A) Diabetes Mellitus (B) Uremia
(C) Nephritis (D) Muscular dystrophy

340. Δ^9 indicates a double bond between carbon atoms of the fatty acids:

(A) 8 and 9 (B) 9 and 10
(C) 9 and 11 (D) 9 and 12

341. The number of carbon atoms in decanoic acid present in butter:

(A) 6 (B) 8
(C) 10 (D) 12

342. Arachidonic acid contains the number of double bonds:

(A) 2 (B) 3
(C) 4 (D) 5

343. The prostaglandins are synthesized from

(A) Arachidonic acid (B) Oleic acid
(C) Linoleic acid (D) Linolenic acid

344. The Iodine number of essential fatty acids of vegetable oils:

(A) High (B) Very high
(C) Very low (D) Low

345. Cholesterol is a

(A) Animal sterol (B) M.F. $C_{27}H_{46}O$
(C) 5 methyl groups (D) All of these

346. Waxes contain higher alcohols named as

(A) Methyl (B) Ethyl
(C) Phytyl (D) Cetyl

347. Lieberman-Burchard reaction is performed to detect

(A) Cholesterol (B) Glycerol
(C) Fatty acid (D) Vitamin D

348. Lipose present in the stomach cannot hydrolyze fats owing to

(A) Alkalinity (B) Acidity
(C) High acidity (D) Neutrality

349. Fatty acids are oxidized by

(A) α-oxidation (B) β-oxidation
(C) ω-oxidation (D) All of these

350. The fatty acids containing even number and odd number of carbon atoms as well as the unsaturated fatty acids are oxidized by

(A) α-oxidation (B) β-oxidation
(C) ω-oxidation (D) All of these

351. Long chain fatty acids are first activated to acyl CoA in the

(A) Cytosol (B) Mitochodria
(C) Ribosomes (D) Microsome

352. Long chain acyl CoA penetrates mitochondria in the presence of

(A) Palmitate (B) Carnitine
(C) Sorbitol (D) DNP

353. Acyl-CoA dehydrogenase converts Acyl CoA to α-β unsaturated acyl-CoA in presence of the coenzyme:

(A) NAD^+ (B) $NADP^+$
(C) ATP (D) FAD

354. For the activation of long chain fatty acids the enzyme thiokinase requires the cofactor:

(A) Mg^{++} (B) Ca^{++}
(C) Mn^{++} (D) K^+

355. ω-oxidation takes place by the hydroxylase in microsomes involving

(A) Cytochrome b (B) Cytochrome c
(C) Cytochrome p-4500 (D) Cytochrome a_3

356. Carboxylation of acetyl—CoA to malonyl — CoA takes place in presence of

(A) FAD^+ (B) Biotin
(C) NAD^+ (D) $NADP^+$

357. Malonyl-CoA reacts with the central

(A) —SH group (B) $—NH_2$ group
(C) —COOH group (D) $—CH_2OH$ group

358. Fatty acid synthesis takes place in the presence of the coenzyme:

(A) NAD^+ (B) Reduced NAD
(C) $NADP^+$ (D) Reduced NADP

359. Fatty acids are activated to acyl CoA by the enzyme thiokinase:

(A) NAD^+ (B) $NADP^+$
(C) CoA (D) FAD^+

360. Phospholipids help the oxidation of

(A) Glycerol (B) Fatty acids
(C) Glycerophosphates (D) None of these

361. The desaturation and chain elongation system of polyunsaturated fatty acids are greatly diminished in the absence of

(A) Insulin (B) Glycagon
(C) Epinephrine (D) Thyroxine

362. Prostaglandins are liberated in the circulation by the stimulation of

(A) Anterior pituitary glands
(B) Posterior pituitary glands
(C) Adrenal gland
(D) Thyroid gland

363. Prostaglandins have a common structure based on prostanoic acid which contains carbon atoms:

(A) 12 (B) 16
(C) 18 (D) 20

364. The carbon chains of prostanoic acid are bonded at the middle of the chain by a

(A) 5-membered ring (B) 6-membered ring
(C) 8-membered ring (D) None of these

365. All active prostaglandins have atleast one double bond between positions:

(A) 7 and 8 (B) 9 and 10
(C) 11 and 12 (D) 13 and 14

366. The enzyme systems for lengthening and shortening for saturating and desaturating of fatty acids occur in

(A) Intestine (B) Muscle
(C) Kidney (D) Liver

367. Which of the following are classified as essential fatty acids?

(A) Arachidonic acid (B) Oleic acid
(C) Acetic acid (D) Butyric acid

368. Prostaglandins are synthesized in the body from

(A) Myristic acid (B) Arachidonic acid
(C) Stearic acid (D) Lignoceric acid

369. All the following saturated fatty acids are present in buffer except

(A) Butyric acid (B) Capryllic acid
(C) Caproic acid (D) Capric acid

370. Biological functions of lipids include

(A) Source of energy
(B) Insulating material
(C) Maintenance of cellular integrity
(D) All of these

371. Saponification number is

(A) mg of KOH required to saponify one gm of fat or oil
(B) mg of KOH required to neutralize free fatty acids of one gms of fat
(C) mg of KOH required to neutralize the acetic acid obtained by saponification of one gm of fat after it has been acetylated
(D) None of these

372. Lipids have the following properties:

(A) Insoluble in water and soluble in fat solvent
(B) High energy content
(C) Structural component of cell membrane
(D) All of these

373. Carbohydrate moiety in cerebrosides is

(A) Glucose (B) Sucrose
(C) Galactose (D) Maltose

374. Which of the following is not an unsaturated fatty acid?

(A) Oleic acid (B) Stearic acid
(C) Linaoleic acid (D) Palmitic acid

375. All the following are functions of prostaglandins except

(A) Lowering of B.P
(B) Introduction of labour
(C) Anti inflammatory
(D) Prevention of myocardial infraction

376. Calorific value of lipids per gm is

(A) 4 Kcal (B) 8 Kcal
(C) 9 Kcal (D) None of these

377. Fatty acid present in kerotin is

(A) Lignoceric acid (B) Cerebromic acid
(C) Nervonic acid (D) Hydroxynervonic acid

378. All the following are ketones except

(A) Xylulose (B) Ribolose
(C) Erythrose (D) Fructose

379. Saponification:

(A) Hydrolysis of fats by alkali
(B) Hydrolysis of glycerol by liposes
(C) Esterification
(D) Reduction

380. Number of ml of 0.1 N KOH required to neutralize fatty acids from 5 gms of fat:

(A) Iodine number
(B) Polenske number
(C) Reichert-Miessl number
(D) None of these

381. Hydrated density of HD lipoproteins is

(A) 0.94 gm/ml
(B) 0.94–1.006 gm/ml
(C) 1.006–1.063 gm/ml
(D) 1.063–1.21 gm/ml

382. Saponification number indicates

(A) Unsaturation in fat
(B) Average M.W of fatty acid
(C) Acetyl number
(D) Acid number

383. Acrolein Test is positive for

(A) Glycerol (B) Prostaglandins
(C) Carbohydrates (D) Proteins

384. Iodine number denotes

(A) Degree of unsaturation
(B) Saponification number
(C) Acid number
(D) Acetyl number

385. Maximum energy produced by

(A) Fats (B) Carbohydrates
(C) Proteins (D) Nucleic acids

386. Lecithins are composed of

(A) Glycerol + Fatty acids + Phosphoric acid + Choline
(B) Glycerol + Fatty acids + Phosphoric acid + Ethanolamine
(C) Glycerol + Fatty acids + Phosphoric acid + Serine
(D) Glycerol + Fatty acids + Phosphoric acid + Beaine

387. Sphingomyelins are composed of fatty acids, phosphoric acid and

(A) Sphingosine and choline
(B) Glycerol and sphingosine
(C) Glycerol and Serine
(D) Glycerol and Choline

388. Depot fats of mammalian cells comprise mostly of

(A) Cholesterol (B) Cholesterol esters
(C) Triacyl glycerol (D) Phospholipids

389. When choline of lecithine is replaced by ethanolamine the product is

(A) Sphingomyelin (B) Cephalin
(C) Plasmalogens (D) Lysolecithine

390. Which of the following is a hydroxy fatty acid?

(A) Oleic acid (B) Ricinoleic acid
(C) Caproic acid (D) Stearic acid

391. Acrolein test is answered by

(A) Cholesterol (B) Glycerol
(C) Glycosides (D) Sphingol

392. The smell of fat turned rancid is due to

(A) Presence of vit E (B) Presence of quinones
(C) Phenols (D) Volatile fatty acids

393. Phospholipids are important cell membrane components because

(A) They have glycerol
(B) They can form bilayers in water
(C) They have both polar and non polar potions
(D) They combine covalently with proteins

394. Which one of the following is not a phospholipid?

(A) Lecithin (B) Plasmalogen
(C) Lysolecithin (D) Gangliosides

395. A fatty acid which is not synthesized in human body and has to be supplied in the diet:

(A) Palmitic acid (B) Oleic acid
(C) Linoleic acid (D) Stearic acid

396. In cephalin, choline is replaced by

(A) Serine (B) Ethanolamine
(C) Betaine (D) Sphingosine

397. The triacyl glycerol present in plasma lipoproteins are hydrolyzed by

(A) Linqual lipase (B) Pancreatic lipase
(C) Colipase (D) Lipoprotein lipase

398. Amphiphatic lipids are

(A) Hydrophilic (B) Hydrophobic
(C) Both (A) and (B) (D) Lipophilic

399. Which of the following is not essential fatty acid?

(A) Oleic acid (B) Linoleic acid
(C) Arachidonic acid (D) Linolenic acid

400. The calorific value of lipid is

(A) 4.0 Kcal/gm (B) 6.0 Kcal/gm
(C) 9.0 Kcal/gm (D) 15 Kcal/gm

401. Rancidity of butter is prevented by the addition of

(A) Vitamin D (B) Tocopherols
(C) Presence of priotin (D) Presence of 'Cu'

402. Sphingomyelins on hydrolysis yields

(A) Glycerol, fatty acids, phosphoric acid and choline
(B) Glycerol, sphingosine, choline and fatty acids
(C) Sphingosine, phosphoric acid, Glycerol and inositol
(D) Sphingosine, fatty acids, phosphoric acid and choline

403. Inherited deficiency of enzyme *cerebrosidase* produces

(A) Fabry's disease
(B) Niemann pick disease
(C) Gaucher's disease
(D) Tay-sach's disease

404. Phosphatidic acid on hydrolysis yields

(A) Glycerol, fatty acids, phosphoric acid, choline
(B) Glycerol, fatty acids, phosphoric acid
(C) Glycerol, fatty acids, phosphoric acid, Glucose
(D) Sphingol, fatty acids, phosphoric acid

405. The maximum number of double bonds present in essential fatty acid is

(A) 1 (B) 2
(C) 3 (D) 4

406. Cerebrosides are composed of

(A) Sphingosine, fatty acids, glycerol and phosphoric acid
(B) Sphingosine, fatty acids, galactose
(C) Glycerol, fatty acids, galactose
(D) Glycerol, fatty acids, galactose, sphingol

407. Acetoacetic acid and β-OH butyric acid are formed as

(A) Kidneys (B) Heart
(C) Liver (D) Intestine

408. Which amino acid is a lipotropic factor?

(A) Lysine (B) Leucine
(C) Tryptophan (D) Methionine

409. The class of lipoproteins having a beneficial effect in atherosclerosis is

(A) Low density of lipoproteins
(B) very low density lipoproteins
(C) High density lipoproteins
(D) Chylomicrons

410. Cholesterol is the precursor for the biosynthesis of

(A) fatty acid (B) prostaglandins
(C) bile acids (D) sphingmyelin

411. Which of the following condition is characterized by ketonuria but without glycosuria?

(A) Diabetes mellitus
(B) Diabetes insipidus
(C) Prolonged starvation
(D) Addison's disease

412. Ketone bodies are formed in

(A) Kidney (B) Liver
(C) Heart (D) Intestines

413. Changes in serum high density lipoproteins (HDL) are more truly reflected by those of

(A) HDL-1 (B) HDL-2
(C) HDL-3 (D) HDL_C

414. Mitochondrial lipogenesis requires

(A) bicarbonate
(B) biotin
(C) acetyl CoA carboxylase
(D) NADPH

415. Fatty acids having chain length of 10 carbon atoms enter the

(A) Portal ciruclation (B) Lacteals
(C) Systemic circulation (D) Colon

416. A soluble system for synthesis of fatty acids have been isolated from avian liver, required for the formation of long chain fatty acids by this system is

(A) ATP (B) Acetyl CoA
(C) NADPH (D) All of these

417. Most animal tissues contain appreciable amounts of lipid, when in the form of depot fat it consists largely of

(A) Cholesterol ester (B) Phosphatides
(C) Chylomicrons (D) Triacylglycerol

418. A fatty acid not synthesized in man is

(A) Oleic (B) Palmitic
(C) Linoleic (D) Stearic

419. The 'free fatty acids' (FFA) of plasma:

(A) metabolically inert
(B) mainly bound to β-lipoproteins
(C) stored in the fat
(D) mainly bound to serum albumin

420. Adipose tissue which is a store house for triacyl glycerol synthesis the same using

(A) The glycerol released by hydrolysis of triacyl glycerol
(B) The glycerol-3-phosphate obtained in the metabolism of glucose
(C) 2-phosphoglycerate
(D) 3-phosphoglycerate

421. Increase in blood of this class of lipoproteins is beneficial to ward off coronary heart disease:

(A) HDL (B) LDL
(C) VLDL (D) IDL

422. In the extra mitochondrial synthesis of fatty acids, CO_2 is utilized

(A) To keep the system anaerobic and prevent regeneration of acetyl CoA
(B) In the conversion of malonyl to CoA hydroxybutyryl CoA
(C) In the conversion of acetyl CoA to malonyl CoA
(D) In the formation of acetyl CoA from 1 carbon intermediates

423. Current concepts concerning the intestinal absorption of triacylglycerols are that

(A) They must be completely hydrolysed before the constituent fatty acids can be absorbed
(B) They are hydrolysed partially and the material absorbed consists of free fatty acids, mono and diacyl glycerols and unchanged triacyl glycerols
(C) Fatty acids with less than 10 carbon atoms are absorbed about equally via lymph and via portal blood
(D) In the absence of bile the hydrolysis of triacyl glycerols is absorbed

424. Main metabolic end product of cholesterol:

(A) Coprosterol (B) 5-pregnenolone
(C) Bile acid (D) Glycine

425. In the type II (a) hyper lipoproteinemia there is increase in

(A) Chylomicron bond (B) β
(C) Pre beta (D) α

426. Normal fat content of liver is about _____ gms %.

(A) 5 (B) 8
(C) 10 (D) 15

427. Obesity is accumulation of _____ in the body.

(A) Water (B) NaCl
(C) Fat (D) Proteins

428. The first lipoprotein to be secreted by the liver is

(A) VLDL (B) nascent VLDL
(C) LDL (D) IDL

429. This lipoprotein removes cholesterol from the body

(A) HDL (B) VLDL
(C) IDL (D) Chylomicrons

430. When the stired triacylglycerol is lipolysed in the adipose tissue blood levels of ____ increased.

(A) FFA only
(B) Glycerol only
(C) Free fatty acids (FFA) and Glycerol
(D) Triacyl glycero

431. All long chain fatty acids with even number of carbon atoms are oxidized to a pool of _____ by β-oxidation.

(A) CO_2 (B) Propionic acid
(C) Acetic acid (D) Acetyl CoA

432. The level of free fatty acids in plasma is increased by

(A) Insulin (B) Caffeine
(C) Glucose (D) Niacin

433. Cholesterol is excreted as such into _____.

(A) Urine (B) Faeces
(C) Bile (D) Tears

434. LCAT is

(A) Lactose choline alamine transferse
(B) Lecithin cholesterol acyl transferase
(C) Lecithin carnitine acyl transferase
(D) Lanoleate carbamoyl acyl transferase

435. Cholesterol molecule has _____ carbon atoms.

(A) 27 (B) 21
(C) 15 (D) 12

436. A hydrocarbon formed in cholesterol synthesis is

(A) Mevalonate (B) HMG CoA
(C) Squalene (D) Zymosterol

437. While citrate is converted to isocitrate in the mitochondria, it is converted to _____ in the cytosol.

(A) Acetyl CoA + oxaloacetate
(B) Acetyl CoA + malonyl CoA
(C) Acetyl CoA + Pyruvate
(D) Acetyl CoA + acetoacetyl CoA

438. Avidin is antigonistic to

(A) Niacin (B) PABA
(C) Biotin (D) Pantothenic acid

439. CTP is required for the synthesis of

(A) Fatty acids (B) Proteins
(C) Phospholipids (D) Cholesterol

440. Lysolecithin is formed from lecithin by the action of

(A) Phospholipase A_1 (B) Phospholipase A_2
(C) Phospholipase C (D) Phospholipase D

441. Fatty acids can not be converted into carbohydrates in the body, as the following reaction is not possible:

(A) Conversion of glucose-6-phosphate into glucose
(B) Fructose 1, 6 diphosphate to fructose-6-phosphate
(C) Transformation of acetyl CoA to pyruvate
(D) Formation of acetyl CoA from fatty acids

442. Cholesterol circulates in blood stream chiefly as

(A) Free cholesterol
(B) Ester cholesterol
(C) Low density lipoproteins
(D) Low density lipoproteins and high density lipoproteins

443. What is the sub cellular site for the β-oxidation of fatty acids?

(A) Nucleus (B) Mitochondria
(C) Lysosome (D) Cytosol

444. A diet containing this fat is helpful in lowering the blood cholesterol level.

(A) Unsaturated (B) Saturated
(C) Vitamin enriched (D) Refined

445. Phospholipase A_2 is an enzyme which removes a fatty acid residue from lecithin to form

(A) Lecithin fragments
(B) Phosphotidic acid
(C) Glyceryl phosphate
(D) Lysolecithin

446. Pancreatic lipose is an enzyme which hydrolyzes facts. It acts as a/an

(A) peptidase (B) hydrolase
(C) carbohydrates (D) dehydrogenase

447. This interferes with cholesterol absorption

(A) Lipoprotein lipase
(B) Creatinase
(C) 7-dehydrocholesterol
(D) β-sitosterol

448. The carbon chain of fatty acids is shortened by 2 carbon atoms at a time. This involves successive reactions catalysed by 4-enzymes. These act the following order:

(A) Acetyl CoA dehydrogenase, β-OH acyl CoA dehydrogenase, enoyl hydrase, thiolose
(B) Acyl CoA dehydrogenase, thiolase, enoyl hydrase, β-OH acyl CoA dehydrogenase
(C) Acyl CoA dehydrogenase, thiolose, enoyl hydrase, β-OH acyl CoA dehydrogenase
(D) Enoyl hydrase, β-OH acyl CoA dehydrogenase, acyl CoA dehydrogenase, thiolose,

449. Acyl carrier protein is involved in the synthesis of

(A) protein
(B) glycogen
(C) fatty acid outside the mitochondria
(D) fatty acid in the mitochondria

450. 1 molecule of palmitic acid on total oxidation to CO_2 will yield molecules of ATP (as high energy bonds):

(A) 129 (B) 154
(C) 83 (D) 25

451. HMG CoA is formed in the metabolism of

(A) Cholesterol, ketones and leucine
(B) Cholesterol, fatty acid and Leucine
(C) Lysine, Lecuine and Isoleucine
(D) Ketones, Leucine and Lysine

452. NADPH is produced when this enzyme acts

(A) Pyruvate dehydrogenase
(B) Malic enzyme
(C) Succinate dehydrogenase
(D) Malate dehydrogenase

453. As a result of each oxidation a long chain fatty acid is cleaved to give

(A) An acid with 3-carbon less and propionyl CoA
(B) An acid with 2-carbon less and acetyl CoA
(C) An acid with 2-carbon less and acetyl CoA
(D) An acid with 4-carbon and butyryl CoA

454. Liposomes are

(A) Lipid bilayered (B) Water in the middle
(C) Carriers of drugs (D) All of these

455. Long chain fatty acyl CoA esters are transported across the mitochondrial membrane by

(A) cAMP (B) Prostaglandin
(C) Carnitine (D) Choline

456. The acetyl CoA formed on β-oxidation of all long chain fatty acids is metabolized under normal circumstances to

(A) CO_2 and water (B) Cholesterol
(C) Fatty acids (D) Ketone bodies

457. Very low density lipoproteins are relatively rich in

(A) Cholesterol (B) Triacyl glycerol
(C) Free fatty acids (D) Phospholipids

458. Neutral fat is stored in

(A) Liver (B) Pancreas
(C) Adipose tissue (D) Brain

459. A pathway that requires NADPH as a cofactor is

(A) Fatty acid oxidation
(B) Extra mitochondrial denovo fatty acid synthesis
(C) Ketone bodies formation
(D) Glycogenesis

460. The 'Committed step' in the biosynthesis of cholesterol from acetyl CoA is

(A) Formation of acetoacetyl CoA from acetyl CoA
(B) Formation of mevalonate from HMG CoA
(C) Formation of HMG CoA from acetyl CoA and acetoacetyl CoA
(D) Formation of squalene by *squalene synthetase*

461. In β-Oxidation of fatty acids, which of the following are utilized as coenzymes?

(A) NAD^+ and $NADP^+$
(B) $FADH_2$ and $NADH + H^+$
(C) FAD and FMN
(D) FAD and NAD^+

462. The most important source of reducing equivalents for FA synthesis on the liver is

(A) Glycolysis
(B) HMP-Shunt
(C) TCA cycle
(D) Uronic acid pathway

463. All of the following tissue are capable of using ketone bodies except

(A) Brain (B) Renal cortex
(C) R.B.C. (D) Cardiac muscle

464. The major source of cholesterol in arterial smooth muscle cells is from

(A) IDL (B) LDL
(C) HDL (D) Chylomicrons

465. Ketone bodies are synthesized from fatty acid oxidation products by which of the following organs?

(A) Liver (B) Skeletal muscles
(C) Kidney (D) Brain

466. Chain elongation of fatty acids occurring in mammalian liver takes place in which of the following subcellular fractions of the cell?

(A) Nucleus (B) Ribosomes
(C) Lysosomes (D) Microsomes

467. Which of the following cofactors or their derivatives must be present for the conversion of acetyl CoA to malonyl CoA extramitochondrial fatty acid synthesis?

(A) Biotin (B) FAD
(C) FMN (D) ACP

468. Which of the following statement regarding β-oxidation is true?

(A) Requires β-ketoacyl CoA as a substrate
(B) Forms CoA thioesters
(C) Requires GTP for its activity
(D) Yields acetyl CoA as a product

469. All statements regarding 3-OH-3 methyl glutaryl CoA are true except

(A) It is formed in the cytoplasm
(B) Required in ketogenesis
(C) Involved in synthesis of Fatty acid
(D) An intermediate in cholesterol biosynthesis

470. Which of the following lipoproteins would contribute to a measurement of plasma cholesterol in a normal individual following a 12 hr fast?

(A) Chylomicrons
(B) VLDL
(C) Both VLDL and LDL
(D) LDL

471. All the following statements regarding ketone bodies are true except

(A) They may result from starvation
(B) They are formed in kidneys
(C) They include acetoacetic acid and acetone
(D) They may be excreted in urine

472. In synthesis of Triglyceride from α-Glycero phosphate and acetyl CoA, the first intermediate formed is

(A) β-diacyl glycerol (B) Acyl carnitine
(C) Monoacyl glycerol (D) Phosphatidic acid

473. During each cycle of β-oxidation of fatty acid, all the following compounds are generated except

(A) NADH (B) H_2O
(C) FAD (D) Acyl CoA

474. The energy yield from complete oxidation of products generated by second reaction cycle of β-oxidation of palmitoyl CoA will be

(A) 5 ATP (B) 12 ATP
(C) 17 ATP (D) 34 ATP

475. β-Oxidation of odd-carbon fatty acid chain produces

(A) Succinyl CoA (B) Propionyl CoA
(C) Acetyl CoA (D) Malonyl CoA

476. Brown adipose tissue is characterized by which of the following?

(A) Present in large quantities in adult humans
(B) Mitochondrial content higher than white adipose tissue
(C) Oxidation and phosphorylation are tightly coupled
(D) Absent in hibernating animals

477. Ketosis in partly ascribed to

(A) Over production and Glucose
(B) Under production of Glucose
(C) Increased carbohydrate utilization
(D) Increased fat utilization

478. The free fatty acids in blood are

(A) Stored in fat depots
(B) Mainly bound to β-lipoproteins
(C) Mainly bound to serum albumin
(D) Metabolically most inactive

479. Carnitine is synthesized from

(A) Lysine (B) Serine
(C) Choline (D) Arginine

480. A metabolite which is common to pathways of cholesterol biosynthesis from acetyl-CoA and cholecalciferol formation from cholesterol is

(A) Zymosterol
(B) Lumisterol
(C) Ergosterol
(D) 7 Dehydrocholesterol

481. Acetyl CoA required for extra mitochondrial fatty acid synthesis is produced by

(A) Pyruvate dehydrogenase complex
(B) Citrate lyase
(C) Thiolase
(D) Carnitine-acyl transferase

482. Biosynthesis of Triglyceride and Lecithine both require an intermediate:

(A) Monoacyl glycerol phosphate
(B) Phosphatidic acid
(C) Phosphatidyl ethanol amine
(D) Phosphatidyl cytidylate

483. The rage limiting step cholesterol biosynthesis is

(A) Squalene synthetase
(B) Mevalonate kinase
(C) HMG CoA synthetase
(D) HMG CoA reductase

484. All the following are constituents of ganglioside molecule except

(A) Glycerol (B) Sialic acid
(C) Hexose sugar (D) Sphingosine

485. An alcoholic amine residue is present in which of the following lipids?

(A) Phosphatidic acid (B) Cholesterol
(C) Sphingomyelin (D) Ganglioside

486. Sphingosine is the backbone of all the following except

(A) Cerebroside (B) Ceramide
(C) Sphingomyelin (D) Lecithine

487. Chylomicron, intermediate density lipoproteins (IDL), low density lipoproteins (LDL) and very low density lipoproteins (VLDL) all are serum lipoproteins. What is the correct ordering of these particles from the lowest to the greatest density?

(A) LDL, IDL, VLDL, Chylomicron
(B) Chylomicron, VLDL, IDL, LDL
(C) VLDL, IDL, LDL, Chylomicron
(D) Chylomicron, IDL, VLDL, LDL

488. A compound normally used to conjugate bile acids is

(A) Serine (B) Glycine
(C) Glucoronic acid (D) Fatty acid

489. Which of the following lipoproteins would contribute to a measurement of plasma cholesterol in a normal person following a 12 hr fast?

(A) High density lipoprotiens
(B) Low density lipoproteins
(C) Chylomicron
(D) Chylomicron remnants

490. Which of the following products of triacylglycerol breakdown and subsequent β-Oxidation may undergo gluconeogenesis?

(A) Acetyl CoA (B) Porpionyl CoA
(C) All ketone bodies (D) Some amino acids

491. Which of the following regulates lipolysis in adipocytes?

(A) Activation of fatty acid synthesis mediated by CAMP
(B) Glycerol phosphorylation to prevent futile esterification of fatty acids
(C) Activation of triglyceride lipase as a result of hormone stimulated increases in CAMP levels
(D) Activation of CAMP production by Insulin

492. Which one of the following compounds is a key intermediate in the synthesis of both triacyl glycerols and phospholipids?

(A) CDP Choline (B) Phosphatidase
(C) Triacyl glyceride (D) Phosphatidyl serine

493. During each cycle of on going fatty acid oxidation, all the following compounds are generated except

(A) H_2O (B) Acetyl CoA
(C) Fatty acyl CoA (D) NADH

494. All the following statements describing lipids are true except

(A) They usually associate by covalent interactions

(B) They are structurally components of membranes

(C) They are an intracellular energy source

(D) They are poorly soluble in H_2O

495. All the following statements correctly describe ketone bodies except

(A) They may result from starvation

(B) They are present at high levels in uncontrolled diabetes

(C) They include—OH β-butyrate and acetone

(D) They are utilized by the liver during long term starvation

496. Which of the following features is predicted by the Nicolson–Singer fluid mosaic model of biological membranes?

(A) Membrane lipids do not diffuse laterally

(B) Membrane lipid is primarily in a monolayer form

(C) Membrane lipids freely flip-flop

(D) Membrane proteins may diffuse laterally

497. Oxidative degradation of acetyl CoA in the citric acid cycle gives a net yield of all the following except

(A) $FADH_2$ (B) 3 NADH

(C) 2 ATP (D) $2CO_2$

498. All the following correctly describe the intermediate 3-OH-3-methyl glutaryl CoA except

(A) It is generated enzymatically in the mitochondrial matrix

(B) It is formed in the cytoplasm

(C) It inhibits the first step in cholesterol synthesis

(D) It is involved in the synthesis of ketone bodies

499. Intermediate in the denovo synthesis of triacyl glycerols include all the following except

(A) Fatty acyl CoA

(B) CDP diacyl glycerol

(C) Glycerol-3-phosphate

(D) Lysophosphatidic acid

500. Mitochondrial α-ketoglutarate dehydrogenase complex requires all the following to function except

(A) CoA (B) FAD

(C) NAD^+ (D) $NADP^+$

501. Each of the following can be an intermediate in the synthesis of phosphatidyl choline except

(A) Phosphatidyl inositol

(B) CDP-choline

(C) Phosphatidyl ethanolamine

(D) Diacylglycerol

502. High iodine value of a lipid indicates

(A) Polymerization (B) Carboxyl groups

(C) Hydroxyl groups (D) Unsaturation

503. Cholesterol, bile salts, vitamin D and sex hormones are

(A) Mucolipids (B) Glycolipids

(C) Phospholipids (D) Isoprenoid lipids

504. Water soluble molecular aggregates of lipids are known as

(A) Micelle (B) Colloids

(C) Sphingol (D) Mucin

505. Hypoglycemia depresses insulin secretion and thus increases the rate of

(A) Hydrolysis (B) Reduction

(C) Gluconeogenesis (D) Respiratory acidosis

506. The process of breakdown of glycogen to glucose in the liver and pyruvate and lacate in the muscle is known as

(A) Glyogenesis (B) Glycogenolysis

(C) Gluconeogenesis (D) Cellular degradation

507. Across a membrane phospholipids act as carrier of

(A) Organic compounds

(B) Inorganic ions

(C) Nucleic acids

(D) Food materials

508. Osteomalacia can be prevented by the administration of calcium and a vitamin:

(A) A (B) B

(C) C (D) D

509. Milk sugar is known as

(A) Fructose (B) Glucose
(C) Sucrose (D) Lactose

510. The Instrinisic Factor (HCl and mucoproteins) present in the gastric juice help in the absorption of

(A) Vitamin B_2 (B) Tocopherols
(C) Folic acid (D) Vitmain B_{12}

511. Lipase can act only at pH:

(A) 2.5–4 (B) 3.5–5
(C) 4 to 5 (D) 5–7

512. Bile is produced by

(A) Liver (B) Gall-bladder
(C) Pancreas (D) Intestine

513. Non-protein part of rhodopsin is

(A) Retinal (B) Retinol
(C) Carotene (D) Repsin

514. A pathway that requires NADPH as a co-factor is

(A) Extramitochondrial folic acid synthesis
(B) Ketone body formation
(C) Glycogenesis
(D) Gluconeogenesis

515. LCAT activity is associated with which of the lipo-protein complex?

(A) VLDL (B) Chylomicrones
(C) IDL (D) HDL

516. In β–oxidation of fatty acids which of the following are utilized as co-enzymes?

(A) NAD^+ and $NADP^+$
(B) FAD H_2 and NADH + H^+
(C) FAD and FMN
(D) FAD and NAD^+

517. The lipoprotein with the fastest electrophoretic mobility and lowest TG content are

(A) VLDL (B) LDL
(C) HDL (D) Chylomicrones

518. The essential fatty acids retard

(A) Atherosclerosis (B) Diabetes mellitus
(C) Nepritis (D) Oedema

519. The majority of absorbed fat appears in the forms of

(A) HDL (B) Chylomicrone
(C) VLDL (D) LDL

520. Daily output of urea in grams is

(A) 10 to 20 (B) 15 to 25
(C) 20 to 30 (D) 35 to 45

521. Uremia occurs in

(A) Cirrohsis of liver (B) Nephritis
(C) Diabetes mellitus (D) Coronary thrombosis

522. Carboxyhemoglobin is formed by

(A) CO (B) CO_2
(C) HCO_3 (D) HCN

523. Methemoglobin is formed as a result of the oxidation of haemoglobin by oxidation agent:

(A) Oxygen of Air (B) H_2O_2
(C) $K_4Fe(CN)_6$ (D) $KMnO_4$

524. Methemoglobin can be reduced to haemoglobin by

(A) Removal of hydrogen
(B) Vitamin C
(C) Glutathione
(D) Creatinine

525. Fats are solids at

(A) 10°C (B) 20°C
(C) 30°C (D) 40°C

526. Esters of fatty acids with higher alcohol other than glycerol are called as

(A) Oils (B) Polyesters
(C) Waxes (D) Terpenoids

527. The main physiological buffer in the blood is

(A) Haemoglobin buffer
(B) Acetate
(C) Phosphate
(D) Bicarbonate

528. All of the following substances have been used to estimate GFR except

(A) Inulin (B) Creatinine
(C) Phenol red (D) Mannitol

529. Relationship between GFR and seum creatinine concentration is

(A) Non-existent (B) Inverse
(C) Direct (D) Indirect

530. Urine turbidity may be caused by any of the following except

(A) Phosphates (B) Protein
(C) RBC (D) WBC

531. Urine specific gravity of 1.054 indicates

(A) Excellent renal function
(B) Inappropriate secretion of ADH
(C) Extreme dehydration
(D) Presence of glucose or protein

532. In hemolytic jaundice, the urinary bilirubin is

(A) Normal
(B) Absent
(C) More than normal
(D) Small amount is present

533. In obstructive jaundice, urinary bilirubin is

(A) Absent
(B) Increased
(C) Present
(D) Present in small amount

534. In hemolytic jaundice, bilirubin in urine is

(A) Usually absent
(B) Usually present
(C) Increased very much
(D) Very low

535. The pH of gastric juice of infants is

(A) 2.0 (B) 4.0
(C) 4.5 (D) 5.0

536. The pH of blood is about 7.4 when the ratio between ($NaHCO_3$) and (H_2CO_3) is

(A) 10 : 1 (B) 20 : 1
(C) 25 : 1 (D) 30 : 1

537. The absorption of glucose is decreased by the deficiency of

(A) Vitamin A (B) Vitamin D
(C) Thiamine (D) Vitamin B_{12}

538. For the activity of amylase which of the following is required as co-factor?

(A) HCO_3 (B) Na^+
(C) K^+ (D) Cl

539. Which of the following hormone increases the absorption of glucose from G.I.T?

(A) Insulin (B) Throid hormones
(C) Glucagon (D) FSH

540. Predominant form of storage:

(A) Carbohydrates (B) Fats
(C) Lipids (D) Both (B) and (C)

541. Degradations of Hb takes place in

(A) Mitochondrion (B) Erythrocytes
(C) Cytosol of cell (D) R.E. cells

542. Biluveridin is converted to bilirubin by the process of

(A) Oxidation (B) Reduction
(C) Conjugation (D) Decarboxylation

543. Amylase present in saliva is

(A) α-Amylase (B) β-Amylae
(C) γ -Amylase (D) All of these

544. Phospholipids are important cell membrane components since

(A) They have glycerol
(B) Form bilayers in water
(C) Have polar and non-polar portions
(D) Combine covalently with proteins

545. Which of the following is not a phospholipids?

(A) Lecithin (B) Plasmalogen
(C) Lysolecithin (D) Gangliosides

546. A fatty acid which is not synthesized in human body and has to be supplied in the diet is

(A) Palmitic acid (B) Oleic acid
(C) Linoleic acid (D) Stearic acid

547. Phospholipids occur in

(A) Myelin sheath
(B) Stabilizes chylomicrans
(C) Erythrocyte membrane
(D) All of these

548. Which of the following is not essential fatty acids?

(A) Oleic acid (B) Linoleic acid
(C) Arachidonic acid (D) Linolenic acid

549. The caloric value of lipids is

(A) 6.0 Kcal/g (B) 9.0 Kcal/g
(C) 15.0 Kcal/g (D) 12.0 Kcal/g

550. The maximum number of double bonds present in essential fatty acid is

(A) 2 (B) 3
(C) 4 (D) 5

551. Prostaglandin synfhesis is increased by activating phospholipases by

(A) Mepacrine (B) Angiotensin II
(C) Glucocorticoids (D) Indomenthacin

552. Selwanof's test is positive in

(A) Glucose (B) Fructose
(C) Galactose (D) Mannose

553. Spermatozoa in seminal fluid utilises the following sugar for metabolism:

(A) Galactose (B) Glucose
(C) Sucrose (D) Fructose

554. Depot fats of mammalian cells comprise mostly of

(A) Cholesterol (B) Phospholipid
(C) Cerebrosides (D) Triglycerol

555. When choline of lecithin is replaced by ethanolamine, the product is

(A) Spingomyelin (B) Cephalin
(C) Plasmalogens (D) Lysolecithin

556. Which of the following is a hydroxyl fatty acid?

(A) Oleic Acid (B) Ricinoleic acid
(C) Caproic acid (D) Arachidonic acid

557. Acroleic test is given by

(A) Cholesterol (B) Glycerol
(C) Glycosides (D) Sphingol

ANSWERS

1. A	2. A	3. C	4. C	5. D	6. A
7. C	8. D	9. D	10. B	11. D	12. A
13. B	14. A	15. D	16. B	17. B	18. D
19. C	20. D	21. C	22. A	23. D	24. C
25. A	26. A	27. C	28. B	29. B	30. D
31. A	32. A	33. C	34. A	35. A	36. C
37. D	38. A	39. B	40. C	41. D	42. A
43. B	44. C	45. D	46. A	47. D	48. B
49. C	50. C	51. A	52. B	53. D	54. B
55. C	56. D	57. A	58. B	59. D	60. C
61. A	62. A	63. A	64. D	65. B	66. A
67. A	68. B	69. A	70. A	71. A	72. B
73. A	74. D	75. B	76. A	77. B	78. A
79. B	80. C	81. C	82. A	83. A	84. A
85. B	86. B	87. A	88. B	89. D	90. C
91. D	92. B	93. A	94. D	95. B	96. A
97. B	98. D	99. A	100. A	101. C	102. B
103. A	104. B	105. C	106. C	107. B	108. A
109. B	110. C	111. D	112. A	113. A	114. A
115. D	116. A	117. A	118. D	119. C	120. D
121. D	122. A	123. A	124. D	125. B	126. A
127. B	128. A	129. B	130. C	131. B	132. C
133. C	134. B	135. D	136. A	137. C	138. C
139. C	140. B	141. B	142. B	143. C	144. D
145. B	146. D	147. C	148. B	149. A	150. A
151. A	152. A	153. C	154. B	155. D	156. D
157. D	158. D	159. D	160. C	161. B	162. B
163. D	164. C	165. D	166. B	167. D	168. B
169. C	170. A	171. D	172. C	173. A	174. B
175. B	176. C	177. D	178. B	179. B	180. C
181. C	182. B	183. C	184. D	185. D	186. D
187. C	188. B	189. D	190. B	191. C	192. D
193. C	194. C	195. A	196. D	197. B	198. D
199. A	200. C	201. A	202. D	203. C	204. B
205. D	206. A	207. D	208. A	209. C	210. C
211. B	212. A	213. C	214. D	215. D	216. C
217. C	218. D	219. A	220. C	221. D	222. C
223. D	224. D	225. B	226. D	227. D	228. A
229. D	230. B	231. A	232. A	233. D	234. B
235. C	236. C	237. D	238. C	239. B	240. D
241. B	242. D	243. A	244. C	245. C	246. A

247. C	248. C	249. A	250. A	251. C	252. A
253. A	254. B	255. C	256. A	257. C	258. A
259. A	260. A	261. B	262. A	263. C	264. A
265. D	266. A	267. D	268. C	269. C	270. C
271. A	272. C	273. C	274. A	275. A	276. A
277. D	278. C	279. A	280. A	281. D	282. C
283. B	284. C	285. A	286. C	287. A	288. C
289. A	290. D	291. C	292. B	293. C	294. B
295. C	296. B	297. B	298. C	299. B	300. A
301. B	302. C	303. B	304. C	305. C	306. A
307. A	308. B	309. D	310. D	311. D	312. A
313. C	314. A	315. D	316. A	317. C	318. B
319. D	320. A	321. B	322. C	323. D	324. C
325. B	326. A	327. B	328. C	329. B	330. C
331. A	332. C	333. A	334. A	335. A	336. D
337. B	338. A	339. A	340. B	341. C	342. C
343. A	344. D	345. D	346. D	347. A	348. C
349. D	350. B	351. A	352. B	353. D	354. B
355. C	356. C	357. A	358. D	359. C	360. B
361. A	362. C	363. D	364. B	365. A	366. D
367. A	368. D	369. C	370. D	371. C	372. D
373. B	374. B	375. D	376. C	377. A	378. C
379. A	380. B	381. D	382. B	383. A	384. A
385. A	386. A	387. A	388. C	389. B	390. B
391. B	392. D	393. C	394. D	395. C	396. B
397. D	398. C	399. A	400. C	401. B	402. D
403. C	404. B	405. D	406. B	407. C	408. D
409. C	410. C	411. C	412. B	413. B	414. D
415. A	416. D	417. D	418. C	419. D	420. B
421. A	422. C	423. B	424. C	425. B	426. A
427. C	428. B	429. A	430. C	431. D	432. B
433. C	434. B	435. A	436. C	437. A	438. C
439. C	440. B	441. C	442. D	443. B	444. A
445. D	446. B	447. D	448. B	449. C	450. A
451. A	452. B	453. B	454. D	455. C	456. A
457. B	458. C	459. B	460. B	461. D	462. B
463. C	464. B	465. A	466. D	467. A	468. A
469. B	470. D	471. B	472. D	473. B	474. D
475. D	476. B	477. D	478. C	479. A	480. D
481. B	482. B	483. D	484. A	485. C	486. D
487. B	488. B	489. A	490. B	491. C	492. B
493. A	494. A	495. D	496. D	497. C	498. C

499. B	500. D	501. A	502. D	503. D	504. A
505. C	506. B	507. B	508. D	509. D	510. D
511. D	512. A	513. A	514. A	515. D	516. D
517. C	518. A	519. B	520. C	521. B	522. A
523. C	524. B	525. B	526. C	527. D	528. C
529. B	530. B	531. D	532. C	533. B	534. A
535. D	536. B	537. C	538. D	539. B	540. D
541. D	542. B	543. A	544. C	545. D	546. C
547. D	548. A	549. B	550. C	551. B	552. B
553. D	554. D	555. B	556. B	557. B	

EXPLANATIONS FOR THE ANSWERS

5. D The fatty acids that cannot be synthesized by the body and therefore should be supplied through the diet are referred to as essential fatty acids (EFA). Linoleic acid and linolenic acid are essential. Some workers regard arachidonic acid as an EFA although it can be synthesized from linoleic acid.

61. A Phrynoderma (toad skin) is an essential fatty acid deficiency disorder. It is characterized by the presence of horny eruptions on the posterior and the lateral parts of the limbs, on the back and buttocks.

120. D The hydrolysis of triacylglycerols by alkali to produce glycerol and soaps is known as saponification.

173. A Reichert-Meissl number is defined as the number of moles of 0.1 N KOH required to completely neutralize the soluble volatile fatty acids distilled from 5 g fat.

231. A Sphingomyelins (sphingophospholipids) are a group of phospholipids containing sphingosine as the alcohol (in place of glycerol in other phospholipids).

285. A Cyclopentanoperhydrophenanthrene (CPPP), it consists of a phenanthrene nucleus to which a cyclopentene ring is attached.

345. D Cholesterol is an animal sterol with a molecular formula $C_{27}H_{46}O$. it has one hydroxyl group at C_3 and a double bond between C_5 and C_6. An 8 carbon aliphatic side chain is attached to C_{17}, Cholesterol contains of total 5 methyl groups.

398. C The lipids which possess both hydrophobic and hydrophilic groups are known as amphipathic lipids (Greek: amphi- both; pathos- passion).

454. D Liposomes have an intermittent aqueous phase in lipid bilayer. They are produced when amphipathic lipids in aqueous medium are subjected to sonification. Liposomes are used as carriers of drugs to target tissues.

540. D Fats (triacyglycerols) are the most predominant storage form of energy, since they are highly concentrated form of energy (9 Cal/g) and can be stored in an anhydrous form (no association with water).

CHAPTER 5

VITAMINS

1. Vitamins are

(A) Accessory food factors
(B) Generally synthesized in the body
(C) Produced in endocrine glands
(D) Proteins in nature

2. Vitamin A or retinal is a

(A) Steroid
(B) Polyisoprenoid compound containing a cyclohexenyl ring
(C) Benzoquinone derivative
(D) 6-Hydroxychromane

3. β-Carotene, precursor of vitamin A, is oxidatively cleaved by

(A) β-Carotene dioxygenase
(B) Oxygenase
(C) Hydroxylase
(D) Transferase

4. Retinal is reduced to retinol in intestinal mucosa by a specific retinaldehyde reductase utilising

(A) $NADPH + H^+$ (B) FAD
(C) NAD (D) $NADH + H^+$

5. Preformed Vitamin A is supplied by

(A) Milk, fat and liver
(B) All yellow vegetables
(C) All yellow fruits
(D) Leafy green vegetables

6. Retinol and retinal are interconverted requiring dehydrogenase or reductase in the presence of

(A) NAD or NADP (B) $NADH + H^+$
(C) NADPH (D) FAD

7. Fat soluble vitamins are

(A) Soluble in alcohol
(B) one or more Propene units
(C) Stored in liver
(D) All these

8. The international unit of vitamin A is equivalent to the activity caused by

(A) 0.3 µg of Vitamin A alcohol
(B) 0.344 µg of Vitamin A alcohol
(C) 0.6 µg of Vitamin A alcohol
(D) 1.0 µg of Vitamin A alcohol

9. Lumirhodopsin is stable only at temperature below

(A) –10°C (B) –20°C
(C) –40°C (D) –50°C

10. Retinol is transported in blood bound to

(A) Aporetinol binding protein
(B) α_2-Globulin
(C) β-Globulin
(D) Albumin

11. The normal serum concentration of vitamin A in mg/100 ml is

(A) 5–10 (B) 15–60
(C) 100–150 (D) 0–5

12. One manifestation of vitamin A deficiency is

(A) Painful joints
(B) Night blindness
(C) Loss of hair
(D) Thickening of long bones

13. Deficiency of Vitamin A causes

(A) Xeropthalmia
(B) Hypoprothrombinemia
(C) Megaloblastic anemia
(D) Pernicious anemia

14. An important function of vitamin A is

(A) To act as coenzyme for a few enzymes
(B) To play an integral role in protein synthesis
(C) To prevent hemorrhages
(D) To maintain the integrity of epithelial tissue

15. Retinal is a component of

(A) Iodopsin (B) Rhodopsin
(C) Cardiolipin (D) Glycoproteins

16. Retinoic acid participates in the synthesis of

(A) Iodopsin (B) Rhodopsin
(C) Glycoprotein (D) Cardiolipin

17. On exposure to light rhodopsin forms

(A) All trans-retinal (B) Cis-retinal
(C) Retinol (D) Retinoic acid

18. Carr-Price reaction is used to detect

(A) Vitamin A (B) Vitamin D
(C) Ascorbic acid (D) Vitamin E

19. The structure shown below is of

(A) Cholecalciferol
(B) 25-Hydroxycholecalciferol
(C) Ergocalciferol
(D) 7-Dehydrocholesterol

20. Vitamin D absorption is increased in

(A) Acid pH of intestine
(B) Alkaline pH of intestine
(C) Impaired fat absorption
(D) Contents of diet

21. The most potent Vitamin D metabolite is

(A) 25-Hydroxycholecalciferol
(B) 1,25-Dihydroxycholecalciferol
(C) 24, 25-Dihydroxycholecalciferol
(D) 7-Dehydrocholesterol

22. The normal serum concentration of 25-hydroxycholecalciferol in ng/ml is

(A) 0–8 (B) 60–100
(C) 100–150 (D) 8–55

23. The normal serum concentration of 1,25-dihydroxycholecalciferol in pg/ml is

(A) 26–65 (B) 1–5
(C) 5–20 (D) 80–100

24. The normal serum concentration of 24,25-dihydroxycholecalciferol in ng/ml is

(A) 8–20 (B) 25–50
(C) 1–5 (D) 60–100

25. A poor source of Vitamin D is

(A) Egg (B) Butter
(C) Milk (D) Liver

26. Richest source of Vitamin D is

(A) Fish liver oils (B) Margarine
(C) Egg yolk (D) Butter

27. Deficiency of vitamin D causes

(A) Ricket and osteomalacia
(B) Tuberculosis of bone
(C) Hypthyroidism
(D) Skin cancer

28. One international unit (I.U) of vitamin D is defined as the biological activity of

(A) 0.025 µg of cholecalciferol
(B) 0.025 µg of 7-dehydrocholecalciferol
(C) 0.025 µg of ergosterol
(D) 0.025 µg of ergocalciferol

29. The β-ring of 7-dehydrocholesterol is cleaved to form cholecalciferol by

(A) Infrared light
(B) Dim light
(C) Ultraviolet irridation with sunlight
(D) Light of the tube lights

30. Calcitriol synthesis involves

(A) Both liver and kidney
(B) Intestine
(C) Adipose tissue
(D) Muscle

31. Insignificant amount of Vitamin E is present in

(A) Wheat germ oil (B) Sunflower seed oil
(C) Safflower seed oil (D) Fish liver oil

32. The activity of tocopherols is destroyed by

(A) Commercial cooking
(B) Reduction
(C) Conjugation
(D) All of these

33. The requirement of vitamin E is increased with greater intake of

(A) Carbohydrates
(B) Proteins
(C) Polyunsaturated fat
(D) Saturated fat

34. Vitamin E reduces the requirement of

(A) Iron (B) Zinc
(C) Selenium (D) Magnesium

35. The most important natural antioxidant is

(A) Vitamin D (B) Vitamin E
(C) Vitamin B_{12} (D) Vitamin K

36. Tocopherols prevent the oxidation of

(A) Vitamin A (B) Vitamin D
(C) Vitamin K (D) Vitamin C

37. Creatinuria is caused due to the deficiency of vitamin

(A) A (B) K
(C) E (D) D

38. All the following conditions produce a real or functional deficiency of vitamin K except

(A) Prolonged oral, broad spectrum antibiotic therapy
(B) Total lack of red meat in the diet
(C) The total lack of green leafy vegetables in the diet
(D) Being a new born infant

39. Vitamin K is found in

(A) Green leafy plants (B) Meat
(C) Fish (D) Milk

40. Function of Vitamin A:

(A) Healing epithelial tissues
(B) Protein synthesis regulation
(C) Cell growth
(D) All of these

41. Vitamin K_2 was originally isolated from

(A) Soyabean (B) Wheat gram
(C) Alfa Alfa (D) Putrid fish meal

42. Vitamin synthesized by bacterial in the intestine is

(A) A (B) C
(C) D (D) K

43. Vitamin K is involved in posttranslational modification of the blood clotting factors by acting as cofactor for the enzyme:

(A) Carboxylase (B) Decarboxylase
(C) Hydroxylase (D) Oxidase

44. Vitamin K is a cofactor for

(A) Gamma carboxylation of glutamic acid residue
(B) β-Oxidation of fatty acid
(C) Formation of γ-amino butyrate
(D) Synthesis of tryptophan

45. Hypervitaminosis K in neonates may cause

(A) Porphyria (B) Jaundice
(C) Pellagra (D) Prolonged bleeding

46. Dicoumarol is antagonist to

(A) Riboflavin (B) Retinol
(C) Menadione (D) Tocopherol

47. In the individuals who are given liberal quantities of vitamin C, the serum ascorbic acid level is

(A) 1–1.4 μg/100 ml
(B) 2–4 μg/100 ml
(C) 1–10 μg/100 ml
(D) 10–20 μg/100 ml

48. The vitamin which would most likely become deficient in an individual who develop a completely carnivorous life style is

(A) Thiamin (B) Niacin
(C) Vitamin C (D) Cobalamin

49. In human body highest concentration of ascorbic acid is found in

(A) Liver (B) Adrenal cortex
(C) Adrenal medulla (D) Spleen

50. The vitamin required for the formation of hydroxyproline (in collagen) is

(A) Vitamin C (B) Vitamin A
(C) Vitamin D (D) Vitamin E

51. Vitamin required for the conversion of p-hydroxyphenylpyruvate to homogentisate is

(A) Folacin (B) Cobalamin
(C) Ascorbic acid (D) Niacin

52. Vitamin required in conversion of folic acid to folinic acid is

(A) Biotin (B) Cobalamin
(C) Ascorbic acid (D) Niacin

53. Ascorbic acid can reduce

(A) 2, 6-Dibromobenzene
(B) 2, 6-Diiodoxypyridine
(C) 2, 6-Dichlorophenol indophenol
(D) 2, 4-Dinitrobenzene

54. Sterilised milk lacks in

(A) Vitamin A (B) Vitamin D
(C) Vitamin C (D) Thiamin

55. Scurvy is caused due to the deficiency of

(A) Vitamin A (B) Vitamin D
(C) Vitamin K (D) Vitamin C

56. Both Wernicke's disease and beriberi can be reversed by administrating

(A) Retinol (B) Thiamin
(C) Pyridoxine (D) Vitamin B_{12}

57. The Vitamin B_1 deficiency causes

(A) Ricket (B) Nyctalopia
(C) Beriberi (D) Pellagra

58. Concentration of pyruvic acid and lactic acid in blood is increased due to deficiency of the vitamin

(A) Thiamin (B) Riboflavin
(C) Niacin (D) Pantothenic acid

59. Vitamin B_1 coenzyme (TPP) is involved in

(A) Oxidative decarboxylation
(B) Hydroxylation
(C) Transamination
(D) Carboxylation

60. Increased glucose consumption increases the dietary requirement for

(A) Pyridoxine (B) Niacin
(C) Biotin (D) Thiamin

61. Thiamin is oxidized to thiochrome in alkaline solution by

(A) Potassium permanganate
(B) Potassium ferricyanide
(C) Potassium chlorate
(D) Potassium dichromate

62. Riboflavin is a coenzyme in the reaction catalysed by the enzyme

(A) Acyl CoA synthetase
(B) Acyl CoA dehydrogenase
(C) β-Hydroxy acyl CoA
(D) Enoyl CoA dehydrogenase

63. The daily requirement of riboflavin for adult in mg is

(A) 0–1.0 (B) 1.2–1.7
(C) 2.0–3.5 (D) 4.0–8.0

64. In new born infants phototherapy may cause hyperbilirubinemia with deficiency of

(A) Thiamin (B) Riboflavin
(C) Ascorbic acid (D) Pantothenic acid

65. Riboflavin deficiency causes

(A) Cheilosis
(B) Loss of weight
(C) Mental deterioration
(D) Dermatitis

66. Magenta tongue is found in the deficiency of the vitamin

(A) Riboflavin (B) Thiamin
(C) Nicotinic acid (D) Pyridoxine

67. Corneal vascularisation is found in deficiency of the vitamin:

(A) B_1 (B) B_2
(C) B_3 (D) B_6

68. The pellagra preventive factor is

(A) Riboflavin (B) Pantothenic acid
(C) Niacin (D) Pyridoxine

69. Pellagra is caused due to the deficiency of

(A) Ascorbic acid (B) Pantothenic acid
(C) Pyridoxine (D) Niacin

70. Niacin or nicotinic acid is a monocarboxylic acid derivative of

(A) Pyridine (B) Pyrimidine
(C) Flavin (D) Adenine

71. Niacin is synthesized in the body from

(A) Tryptophan (B) Tyrosine
(C) Glutamate (D) Aspartate

72. The proteins present in maize are deficient in

(A) Lysine (B) Threonine
(C) Tryptophan (D) Tyrosine

73. Niacin is present in maize in the form of

(A) Niatin (B) Nicotin
(C) Niacytin (D) Nicyn

74. In the body 1 mg of niacin can be produced from

(A) 60 mg of pyridoxine
(B) 60 mg of tryptophan
(C) 30 mg of tryptophan
(D) 30 mg of pantothenic acid

75. Pellagra occurs in population dependent on

(A) Wheat (B) Rice
(C) Maize (D) Milk

76. The enzymes with which nicotinamide act as coenzyme are

(A) Dehydrogenases (B) Transaminases
(C) Decarboxylases (D) Carboxylases

77. Dietary requirement of Vitamin D:

(A) 400 I.U. (B) 1000 I.U.
(C) 6000 I.U. (D) 700 I.U.

78. The Vitamin which does not contain a ring in the structure is

(A) Pantothenic acid (B) Vitamin D
(C) Riboflavin (D) Thiamin

79. Pantothenic acid is a constituent of the coenzyme involved in

(A) Decarboxylation (B) Dehydrogenation
(C) Acetylation (D) Oxidation

80. The precursor of CoA is

(A) Riboflavin (B) Pyridoxamine
(C) Thiamin (D) Pantothenate

81. 'Burning foot syndrome' has been ascribed to the deficiency of

(A) Pantothenic acid (B) Thiamin
(C) Cobalamin (D) Pyridoxine

82. Pyridoxal phosphate is central to

(A) Deamination (B) Amidation
(C) Carboxylation (D) Transamination

83. The vitamin required as coenzyme for the action of transaminases is

(A) Niacin
(B) Pantothenic acid
(C) Pyridoxal phosphate
(D) Riboflavin

84. Vitamin B_6 deficiency may occur during therapy with

(A) Isoniazid (B) Terramycin
(C) Sulpha drugs (D) Aspirin

85. Deficiency of vitamin B_6 may occur in

(A) Obese person (B) Thin person
(C) Alcoholics (D) Diabetics

86. 'Xanthurenic acid index' is a reliable criterion for the deficiency of the vitamin

(A) Pyridoxal (B) Thiamin
(C) Pantothenic acid (D) Cobalamin

87. Epileptiform convulsion in human infants have been attributed to the deficiency of the vitamin

(A) B_1 (B) B_2
(C) B_6 (D) B_{12}

88. Biotin is a coenzyme of the enzyme

(A) Carboxylase (B) Hydroxylase
(C) Decarboxylase (D) Deaminase

89. The coenzyme required for conversion of pyruvate to oxaloacetate is

(A) FAD (B) NAD
(C) TPP (D) Biotin

90. In biotin-containing enzymes, the biotin is bound to the enzyme by

(A) An amide linkage to carboxyl group of glutamine
(B) A covalent bond with CO_2
(C) An amide linkage to an amino group of lysine
(D) An amide linkage to α-carboxyl group of protein

91. A molecule of CO_2 is captured by biotin when it acts as coenzyme for carboxylation reaction. The carboxyl group is covalently attached to

(A) A nitrogen (N_1) of the biotin molecule
(B) Sulphur of thiophene ring
(C) α-Amino group of lysine
(D) α-Amino group of protein

92. Consumption of raw eggs can cause deficiency of

(A) Biotin (B) Pantothenic acid
(C) Riboflavin (D) Thiamin

93. The cofactor or its derivative required for the conversion of acetyl CoA to malonyl-CoA is

(A) FAD (B) ACP
(C) NAD^+ (D) Biotin

94. A cofactor required in oxidative decarboxylation of pyruvate is

(A) Lipoate
(B) Pantothenic acid
(C) Biotin
(D) Para aminobenzoic acid

95. The central structure of B_{12} referred to as corrin ring system consists of

(A) Cobalt (B) Manganese
(C) Magnesium (D) Iron

96. The central heavy metal cobalt of vitamin B_{12} is coordinately bound to

(A) Cyanide group (B) Amino group
(C) Carboxyl group (D) Sulphide group

97. Vitamin B_{12} has a complex ring structure (corrin ring) consisting of four

(A) Purine rings (B) Pyrimidine rings
(C) Pyrrole rings (D) Pteridine rings

98. Emperical formula of cobalamin is

(A) $C_{63}H_{88}N_{12}O_{14}P.CO$
(B) $C_{61}H_{82}N_{12}O_{12}P.CO$
(C) $C_{61}H_{88}N_{12}O_{14}P.CO$
(D) $C_{63}H_{88}N_{14}O_{14}P.CO$

99. A deficiency of vitamin B_{12} causes

(A) Beri-Beri
(B) Scurvy
(C) Perniciuos anemia
(D) Ricket

100. Vitamin B_{12} deficiency can be diagnosed by urinary excretion of

(A) Pyruvate (B) Methylmalonate
(C) Malate (D) Lactate

101. Subacute combined degeneration of cord is caused due to deficiency of

(A) Niacin (B) Cobalamin
(C) Biotin (D) Thiamin

102. Vitamin required for metabolism of diols e.g. conversion of ethylene glycol to acetaldehyde is

(A) Thiamin (B) Cobalamin
(C) Pyridoxine (D) Folic acid

103. Both folic acid and methyl cobalamin (vitamin B_{12}) are required in

(A) Deamination of serine
(B) Deamination of threonine
(C) Conversion of pyridoxal phosphate to pyridoxamine phosphate
(D) Methylation of homocystein to methionine

104. Folic acid or folate consists of the

(A) Base pteridine, p-amino benzoic acid and asparate
(B) Base purine, p-amino benzoic acid and glutamate
(C) Base pteridine, p-amino benzoic acid and glutamate
(D) Base purine, p-hydroxy benzoic acid and glutamate

105. Folate as a coenzyme is involved in the transfer and utilization of

(A) Amino group
(B) Hydroxyl group
(C) Single carbon moiety
(D) Amido group

106. Folic acid deficiency can be diagnosed by increased urinary excretion of

(A) Methylmalonate (B) Figlu
(C) Cystathionine (D) Creatinine

107. Sulpha drugs interfere with bacterial synthesis of

(A) Lipoate (B) Vitamin E
(C) Tetrahydrofolate (D) Ascorbic acid

108. Folate deficiency causes

(A) Microcytic anemia
(B) Hemolytic anemia
(C) Iron deficiency anemia
(D) Megaloblastic anemia

109. Thiamin is heat stable in

(A) Acidic medium (B) Alkaline medium
(C) Both (A) and (B) (D) None of these

110. Thiamin deficiency includes

(A) Mental depression (B) Fatigue
(C) Beriberi (D) All of these

111. Thiamin diphosphate is required for oxidative decarboxylation of

(A) α-Keto acids (B) α-Amino acids
(C) Fatty acids (D) All of these

112. Loss of thiamin can be decreased by using

(A) Unpolished rice
(B) Parboiled rice
(C) Whole wheat flour
(D) All of these

113 . Daily requirement of thiamin is

(A) 0.1 mg/1,000 Calories
(B) 0.5 mg/1,000 Calories
(C) 0.8 mg/1,000 Calories
(D) 1.0 mg/1,000 Calories

114. Thiamin requirement is greater in

(A) Non-vegetarians
(B) Alcoholics
(C) Pregnant women
(D) Both B and C

115. People consuming polished rice as their staple food are prone to

(A) Beriberi (B) Pellagra
(C) Both (A) and (B) (D) None of these

116. Riboflavin is heat stable in

(A) Acidic medium (B) Alkaline medium
(C) Neutral medium (D) Both (A) and (C)

117. FAD is a coenzyme for

(A) Succinate dehydrogenase
(B) Glycerol-3-phosphate dehydrogenase
(C) Sphingosine reductase
(D) All of these

118. Riboflavin deficiency can cause

(A) Peripheral neuritis (B) Diarrhoea
(C) Angular stomatitis (D) None of these

119. Pellagra preventing factor is

(A) Thiamin (B) Riboflavin
(C) Niacin (D) Pyridoxine

120. Niacin contains a

(A) Sulphydryl group (B) Carboxyl group
(C) Amide group (D) All of these

121. NADP is required as a coenzyme in

(A) Glycolysis (B) Citric acid cycle
(C) HMP shunt (D) Gluconeogenesis

122. NAD is required as a coenzyme for

(A) Malate dehydrogenase
(B) Succinate dehydrogenase
(C) Glucose-6-phosphate dehydrogenase
(D) HMG CoA reductae

123. NAD is required as a conenzyme in

(A) Citric acid cycle
(B) HMP shunt
(C) β-Oxidation of fatty acids
(D) Both (A) and (C)

124. Niacin can be synthesised in human beings from

(A) Histidine (B) Phenylalanine
(C) Tyrosine (D) Tryptophan

125. Daily requirement of niacin is

(A) 5 mg (B) 10 mg
(C) 20 mg (D) 30 mg

126. Niacin deficiency is common in people whose staple food is

(A) Wheat
(B) Polished rice
(C) Maize and /or sorghum
(D) None of these

127. In pellagra, dermatitis usually affects

(A) Exposed parts of body
(B) Covered parts of body
(C) Trunk only
(D) All parts of the body

128. Niacin deficiency can occur in

(A) Hartnup disease (B) Phenylketonuria
(C) Alkaptonuria (D) None of these

129. Pantothenic acid contains an amino acid which is

(A) Aspartic acid (B) Glutamic acid
(C) β-Alanine (D) β-Aminoisobutyric acid

130. Sulphydryl group of coenzyme a is contributed by

(A) β-Alanine
(B) β-Aminoisobutyric acid
(C) Methionine
(D) Thioethanolamine

131. Coenzyme A contains a nitrogenous base which is

(A) Adenine (B) Guanine
(C) Choline (D) Ethanolamine

132. The following is required for the formation of coenyzme A:

(A) ATP (B) GTP
(C) CTP (D) None of these

133. Coenzyme A is required for catabolism of

(A) Leucine (B) Isoleucine
(C) Valine (D) All of these

134. Deficiency of pantothenic acid in human beings can affect

(A) Nervous system (B) Digestive system
(C) Both (A) and (B) (D) None of these

135. Pyridoxal phosphate is a coenzyme for

(A) Glutamate oxaloacetate transaminase
(B) Glutamate pyruvate transaminase
(C) Tyrosine transaminase
(D) All of these

136. Pyridoxal phosphate is required as a coenzyme in

(A) Transamination (B) Transulphuration
(C) Desulphydration (D) All of these

137. Pyridoxal phosphate is a coenzyme for

(A) Glycogen synthetase
(B) Phosphorylase
(C) Both (A) and (B)
(D) None of these

138. Pyridoxine deficiency can be diagnosed by measuring urinary excretion of

(A) Pyruvic acid (B) Oxaloacetic acid
(C) Xanthurenic acid (D) None of these

139. Pyridoxine deficiency can be diagnosed by measuring the urinary excretion of xanthurenic acid following a test dose of

(A) Glycine (B) Histidine
(C) Tryptophan (D) Pyridoxine

140. Pyridoxine requirement depends upon the intake of

(A) Carbohydrates (B) Proteins
(C) Fats (D) None of these

141. Anti-egg white injury factor is

(A) Pyridoxine (B) Biton
(C) Thiamin (D) Liponic acid

142. When eggs are cooked

(A) Biotin is destroyed but avidin remains unaffected
(B) Avidin is inactivated but biotin remains unaffected
(C) Both avidin and biotin are inactivated
(D) Both avidin and biotin remain unaffected

143. Biotin is required as a coenzyme by

(A) Anaerobic dehydrogenases
(B) Decarboxylases
(C) Aerobic dehydrogenases
(D) Carboxylases

144. Biotin is a coenzyme for

(A) Pyruvate carboxylase
(B) Acetyl CoA carboxylase
(C) Propionyl CoA carboxylase
(D) All of these

145. Lipoic acid is a conenzyme for

(A) Pyruvate dehydrogenase
(B) α-Ketoglutarate dehydrogenae
(C) Both (A) and (B)
(D) None of these

146. Chemically, lipoic acid is

(A) Saturated fatty acid
(B) Unsaturated fatty acid
(C) Amino acid
(D) Sulphur containing fatty acid

147. Folic acid contains

(A) Pteridine
(B) p-Amino benzoic acid
(C) Glutamic acid
(D) All of these

148. Conversion of folate into tetrahydrofolate requires

(A) NADH (B) NADPH
(C) $FMNH_2$ (D) $FADH_2$

149. Riboflavin deficiency symptoms are

(A) Glossitis (B) stomatis
(C) Vomitting (D) Both (A) and (B)

150. Vitamin B_{12} forms coenzymes known as

(A) Cobamide (B) Transcobalamin I
(C) Transcobalamin II (D) Both (B) and (C)

151. Methylcobalamin is required for formation of

(A) Serin from glycine
(B) Glycine from serine
(C) Methionine from homocysteine
(D) All of these

152. Absorption of Vitamin B_{12} requires the presence of

(A) Pepsin (B) Hydrochloric acid
(C) Intrinsic factor (D) Boh (B) and (C)

153. Intrinsic factor is chemically a

(A) Protein
(B) Glycoprotein
(C) Mucopolysaccaride
(D) Peptide

154. Chemically, Extrinsic Factor of Castle is a

(A) Mucoprotein
(B) Glycoprotein
(C) Mucopolysaccharide
(D) Cyanocobalaminm

155. Vitamin B_{12} is

(A) Not stored in the body
(B) Stored in bone marrow
(C) Stored in liver
(D) Stored in RE cells

156. Vitamin B_{12} is transported in blood by

(A) Albumin (B) Transcortin
(C) Transcobalamin I (D) Transcobalamin II

157. Vitamin B_{12} is synthesized by

(A) Bacteria only (B) Plants only
(C) Animals only (D) Both (A) and (C)

158. Deficiency of vitamin B_{12} can occur because of

(A) Decreased intake of vitamin B_{12}
(B) Atrophy of gastric mucosa
(C) Intestinal malabsorption
(D) All of these

159. Deficiency of vitamin B_{12} can be diagonised by

(A) Carr-Price reaction
(B) Ames assay
(C) Watson-Schwartz test
(D) Schilling test

160. Gastyrectomy leads to megaloblastic anaemia within a few

(A) Days (B) Weeks
(C) Months (D) Years

161. Ascorbic acid is required to synthesise all of the following except

(A) Collagen (B) Bile acids
(C) Bile pigments (D) Epinephrine

162. Vitamin C enhances the intestinal absorption of

(A) Potassium (B) Iodine
(C) Iron (D) None of these

163. Vitamin C activity is present in

(A) D-Ascorbic acid
(B) D-Dehydroascorbic acid
(C) L-Ascorbic acid
(D) Both A and B

164. Vitamin C is required for the synthesis of

(A) Bile acids from cholesterol
(B) Bile salts from bile acids
(C) Vitamin D from cholesterol
(D) All of these

165. Deficiency of vitamin C causes

(A) Beriberi
(B) Pellagra
(C) Pernicious anaemia
(D) Scurvy

166. An early diagnosis of vitamin C deficiency can be made by

(A) Measuring plasma ascorbic acid
(B) Measuring urinary ascorbic acid
(C) Ascorbic acid saturation test
(D) All of these

167. Daily requirement of vitamin C in adults is about

(A) 100 mg (B) 25 mg
(C) 70 mg (D) 100 mg

168. The vitamin having the highest daily requirement among the following is

(A) Thiamin (B) Ribovflavin
(C) Pyridoxine (D) Ascorbic acid

169. Anaemia can occur due to the deficiency of all the following except

(A) Thiamin (B) Pyridoxine
(C) Folic acid (D) Cyanocobalamin

170. A vitamin which can be synthesized by human beings is

(A) Thiamin (B) Niacin
(C) Folic acid (D) Cyanocobalamin

171. Laboratory diagnosis of vitamin B_{12} deficiency can be made by measuring the urinary excretion of

(A) Xanthurenic acid
(B) Formiminoglutamic acid
(C) Methylmalonic acid
(D) Homogentisic acid

172. The molecule of vitamin A_1 contains

(A) Benzene ring (B) β-Ionone ring
(C) β-Carotene ring (D) None of these

173. Precursor of Vitamin A is

(A) α-Carotene (B) β-Carotene
(C) γ-Carotene (D) All of these

174. Two molecules of vitamin A can be formed from 1 molecule of

(A) α-Carotene (B) β-Carotene
(C) γ-Carotene (D) All of these

175. Conversion of β-carotene into retinal requires the presence of

(A) β-Carotene dioxygenase
(B) Bile salts
(C) Molecular oxygen
(D) All of these

176. Conversion of retinal into ritonal requires the presence of

(A) NADH (B) NADPH
(C) $FADH_2$ (D) Lipoic acid

177. Retinal is converted into retinoic acid in the presence of

(A) Retinal oxidase (B) Retinal carboxylase
(C) Retinene reductase (D) Spontaneously

178. Vitamin A absorbed in intestine is released into

(A) Portal circulation (B) Lacteals
(C) Both (A) and (B) (D) None of these

179. Vitamin A is stored in the body in

(A) Liver
(B) Adipose tissue
(C) Reticuloendothelial cells
(D) All of these

180. Rhodopsin contains opsin and

(A) 11-cis-retinal (B) 11-trans-retinal
(C) All-cis-retinal (D) All trans-retinal

181. When light falls on rod cells

(A) All-cis-retinal is converted into all-trans-retinal
(B) 11-cis-retinal is converted into 11-trans-retinal
(C) 11-trans-retinal is converted into all-trans-retinal
(D) 11-cis-retinal is converted into all-trans-retinal

182. Conversion of all-trans-retinal into all-trans-retinol requires

(A) NAD (B) NADH
(C) NADP (D) NADPH

183. Retinol isomerase is present in

(A) Retina (B) Liver
(C) Both (A) and (B) (D) None of these

184. Anti-oxidant activity is present in

(A) β-Carotene (B) Retinol
(C) Retinoic acid (D) All of these

185. One international Unit of vitamin A is the activity present in

(A) 0.3 μg of β-Carotene
(B) 0.3 μg of retinol
(C) 0.6 μg of retinoic acid
(D) All of these

186. Daily requirement of vitamin A in an adult man can be expressed as

(A) 400 IU (B) 1,000 IU
(C) 5,000 IU (D) 10,000 IU

187. Vitamin B_6 includes

(A) Pyridoxal (B) Pyridoxamine
(C) Pyridoxine (D) All of these

188. An early effect of vitamin a deficiency is

(A) Xerophthalmia
(B) Keratomalacia
(C) Prolonged dark adaptation time
(D) Follicular hyperkeratosis

189. Nyctalopia is

(A) Drying of eyes
(B) Destruction of cornea
(C) Blindness
(D) Inability to see in dimlight

190. Rod cells possess a trans-membrane protein which is

(A) Adenylate cyclase (B) Transducin
(C) Rhodopsin (D) B as well as C

191. Provitamins A include

(A) Retinal (B) Retionic acid
(C) Carotenes (D) All of these

192. Retinoic acid can

(A) Act as a photo receptor
(B) Support growth and differentiation
(C) Act as an anti-oxidant
(D) None of these

193. Prosthetic group in cone cell phototreceptors is

(A) Iodine (B) Opsin
(C) 11-cis-retinal (D) all-trans-retinal

194. Retinoic acid is involved in the synthesis of

(A) Rhodopsin (B) Iodopsin
(C) Porphyrinopsin (D) Glycoproteins

195 Transducin is a

(A) Signal transducer (B) Stimulatory G-protein
(C) Trimer (D) All of these

196. Provitamin D_3 is

(A) Cholecalciferol
(B) Ergosterol
(C) 7-Dehydrocholesterol
(D) Ergocaliferol

197. Ergosterol is found in

(A) Animals (B) Plants
(C) Bacteria (D) All of these

198. A provitamin D synthesized in human beings is

(A) Ergosterol
(B) 7-Dehydrocholesterol
(C) Cholecalciferol
(D) 25-Hydroxycholecalciferol

199. 25-Hydroxylation of vitamin D occurs in

(A) Skin (B) Liver
(C) Kidneys (D) Intestinal mucosa

200. Tubular reabsorption of calcium is increased by

(A) Cholecalciferol
(B) 25-Hydroxycholecalciferol
(C) Calcitriol
(D) All of these

201. Parathormone is required for the conversion of

(A) Cholecalciferol into 1-hydroxycholecalciferol
(B) Cholecalciferol into 25-hydroxycholecalciferol
(C) 25-Hydroxycholecalciferol into calcitriol
(D) Cholesterol into 7-dehydrocholesterol

202. Calcitriol inhibits the conversion of

(A) Cholesterol into 7-dehydrocholesterol
(B) Cholecalciferol into 1-hydroxycholecalciferol
(C) Cholecalciferol into 25-hydroxycholecalciferol
(D) 25-Hydroxycholecalciferol into 1,25-dihydroxycholecalciferol

203. Bowlegs and knock-knees can occur in

(A) Rickets (B) Osteomalacia
(C) Both A and B (D) Hypervitaminosis D

204. Calcification of soft tissues can occur in

(A) Osteomalacia
(B) Rickets
(C) Hypervitaminosis D
(D) None of these

205. Levels of serum calcium and inorganic phosphorus are increased in

(A) Hypervitaminosis D
(B) Hypoparathyroidism
(C) Hypovitaminosis D
(D) None of these

206. Requirement of vitamin E increases with the increasing intake of

(A) Calories (B) Proteins
(C) PUFA (D) Cholesterol

207. In human beings, vitamin E prevents

(A) Sterility
(B) Hepatic necrosis
(C) Muscular dystrophy
(D) None of these

208. Vitamin E protects

(A) Polyunsaturated fatty acids against aperoxidation
(B) Vitamin A and carotenes against oxidation
(C) Lung tissue against atmospheric pollutants
(D) All of these

209. Intestinal bacteria can synthesise

(A) Phyllogquinone (B) Farnoquinone
(C) Both (A) and (B) (D) Menadione

210. A water soluble form of vitamin K is

(A) Phylloquinone (B) Farnoquinone
(C) Menadione (D) None of these

211. Prothrombin time is prolonged in

(A) Vitamin K deficiency
(B) Liver damage
(C) Both (A) and (B)
(D) None of these

212. A synthetic form of vitamin K is

(A) Menadione (B) Farnoquinone
(C) Phylloquinone (D) None of these

213. Retinal is reduced to retinol by retinene reductase in presence of the coenzyme

(A) NAD^+ (B) $NADP^+$
(C) $NADH + H^+$ (D) $NADPH + H^+$

214. Retinal exists as an ester with higher fatty acids in the

(A) Liver (B) Kidney
(C) Lung (D) All of these

215. Retinol is transported to the blood as retinol attached to

(A) α_1-globulin (B) α_2-globulin
(C) β-globulin (D) γ-globulin

216. Carotenes are transported with the

(A) Minerals (B) Proteins
(C) Lipids (D) Lipoproteins

217. The drugs that form complexes with pyridoxal are

(A) Isoniazid (B) Penicillamine
(C) Rifampicin (D) Both (A) and (B)

218. In the blood the vitamin esters are attached to

(A) α_1-lipoproteins (B) α_2-lipoproteins
(C) β-lipoproteins (D) γ-lipoproteins

219. The percentage of Vitamin A in the form of esters is stored in the liver:

(A) 80 (B) 85
(C) 90 (D) 95

220. The performed Vitamin A is supplied by foods such as

(A) Butter (B) Eggs
(C) Fish liver oil (D) All of these

221. The non-protein part of rhodopsin is

(A) Retinal (B) Retinol
(C) Carotene (D) Repsin

222. Lumirhodopsin is stable only at a temperature below

(A) –35°C (B) –40°C
(C) –45°C (D) –50°C

223 The normal concentration of vitamin A in blood in I.V/dl:

(A) 20–55 (B) 24–60
(C) 30–65 (D) 35–70

224. Continued intake of excessive amounts of vitamin A especially in children produces

(A) Irritability (B) Anorexia
(C) Headache (D) All of these

225. Vitamin D_2 is also said to be

(A) Activated ergosterol
(B) Fergocalciferol
(C) Viosterol
(D) All of these

226. The poor sources of vitamin D:

(A) Eggs (B) Butter
(C) Milk (D) Liver

227. The activity of tocopherols is destroyed by

(A) Oxidation (B) Reduction
(C) Conjugation (D) All of these

228 Some tocopherols are

(A) Terpenoid in structure
(B) Dional in structure
(C) Isoprenoid in structure
(D) Farnesyl in structure

229. The methyl groups in the aromatic nucleus of a tocopherols are

(A) 2 (B) 3
(C) 4 (D) 5

230. Vitamin E stored in

(A) Mitochondria (B) Microsomes
(C) Both (A) and (B) (D) None of these

231. Vitamin E protects the polyunsaturated fatty acids from oxidation by molecular oxygen in the formation of

(A) Superoxide (B) Peroxide
(C) Trioxide (D) All of these

232. The tocopherols prevent the oxidation of

(A) Vitamin A (B) Vitamin D
(C) Vitamin K (D) Vitamin C

233. Vitamin E protects enzymes from destruction in

(A) Muscles (B) Nerves
(C) Gonads (D) All of these

234. Vitamin K regulates the synthesis of blood clotting factors:

(A) VII (B) IX
(C) X (D) All of these

235. Ascorbic acid can reduce

(A) 2, 4-dinitro benzene
(B) 2, 6-Dichlorophenol Indophenol
(C) 2, 4-dibromobenzene
(D) 2, 6-dibromo benzene

236. Sterilized milk is devoid of

(A) Vitamin A (B) Vitamin B_1
(C) Vitamin C (D) Vitamin D

237. The symptoms of scurvy are

(A) Poor healing of wounds
(B) Loosening of teeth
(C) Anaemia
(D) All of these

238. Kwashiorkor results from

(A) Vitamin A deficiency
(B) Vitamin D deficiency
(C) Deficiency of minerals in diet
(D) Protein and caloric deficiency in diet

239. Which among the following fatty acids is an essential fatty acid for man?

(A) Palmitic acid (B) Oleic acid
(C) Linoleic acid (D) None of these

240. The number of nutritionally essential amino acids for man is

(A) 6 (B) 8
(C) 10 (D) 12

241. Avidin is present in

(A) Cow's milk
(B) Raw egg
(C) Green leafy vegetables
(D) Carrots

242. Marasmus is due to malnutrition of

(A) Proteins
(B) Proteins and calories
(C) Proteins and vitamins
(D) Proteins and minerals

243. Energy value in kilocalorie per gram of fat in the body is

(A) 1 (B) 4
(C) 9 (D) 18

244. Which among the following is an essential amino acid for man?

(A) Alanine (B) Serine
(C) Valine (D) Glutamic acid

245. Under what condition to basal metabolic rate goes up?

(A) Cold environment
(B) Hot environment
(C) Intake of base forming foods
(D) Hypothyroidism

246. What is the major form of caloric storage in human body?

(A) ATP
(B) Glycogen
(C) Creatine phosphate
(D) triacylglycerol

247. The phosphoprotein of milk is

(A) Lactalbumin (B) Lactoglobulin
(C) Vitellin (D) Caein

248. Dictary deficiency of this vitamin leads to night blindness:

(A) Retinol (B) Niacin
(C) Ascorbic acid (D) Cholecalciferol

249. A non essential amino acid is not

(A) Absorbed in the intestines
(B) Required in the diet
(C) Incorporated into the protein
(D) Metabolized by the body

250. The deficiency of Vitamin B_{12} leads to

(A) Pernicious anaemia
(B) Megablastic anaemia
(C) Both (A) and (B)
(D) None of these

251. Which among the following is a nutritionally essential amino acid for man?

(A) Alanine (B) Glycine
(C) Tyrosine (D) Isoleucine

252. The maximum specific dynamic action of food stuff is exerted by

(A) carbohydrates (B) fats
(C) proteins (D) vitamins

253. The essential amino acids

(A) must be supplied in the diet because the organism has lost the capacity to aminate the corresponding ketoacids
(B) must be supplied in the diet because the human has an impaired ability to synthesize the carbon chain of the corresponding ketoacids
(C) are identical in all species studied
(D) are defined as these amino acids which cannot be synthesized by the organism at a rate adequate to meet metabolic requirements

254. Fibre in the diet is beneficial in

(A) Hyper glycemia
(B) Hyper cholseteremia
(C) Colon cancer
(D) All of these

255 Sucrose intolerance leads to

(A) Hyper glycemia (B) Glycosuria
(C) Diarrhoea (D) Hypoglycemia

256. There can be intolerance with respect to the following sugar:

(A) Glucose (B) Lactose
(C) Maltose (D) Xylose

257. Milk contains very poor amounts of

(A) Calcium (B) Phosphate
(C) Iron (D) Riboflavin

258. Egg contains very little

(A) Fat
(B) Proteins
(C) Carbohydrates
(D) Calcium and phosphorus

259. BMR (Basal Metabolic rate) is elevated in

(A) Hyper thyroidism (B) Under nutrition
(C) Starvation (D) Hypothyroidism

260. Soyabean proteins are rich in

(A) Lysine (B) Alanine
(C) Glcyine (D) Aspartic acid

261. Corn and gliadin are low in

(A) Lysine (B) Alanine
(C) Glycine (D) Aspartic acid

262. What is the disease caused by thiamine deficiency?

(A) Nycalopia (B) Scurvy
(C) Rickets (D) Beriberi

263. Retinol and retinol –binding protein (RBP) bound with this protein:

(A) Albumin (B) Prealbumin
(C) α_2-globulin (D) β-globulin

264. Megaloblastic anemia is caused by the deficiency of

(A) Folic acid (B) Vitamin B_6
(C) Iron (D) Protein

265. This vitamin acts as anti-oxidant:

(A) Vitamin A (B) Vitamin D
(C) Vitamin E (D) Vitamin K

266. Calcitriol is

(A) 1-OH-cholecalciferol
(B) 25-OH-cholecalciferol
(C) 24, 25-diOH cholecalciferol
(D) 1, 25-diOH cholecalciferol

267. 1-hydroxylation of 25-OH vitamin D_3 takes place in

(A) Liver (B) Kidneys
(C) Intestine (D) Pancreas

268. 25-hydroxylation of vitamin D_3 takes place in

(A) Liver (B) Kidneys
(C) Intestine (D) Pancreas

269. Hydroxylation of 25-hydroxy cholecalciferol is promoted by

(A) Cytochrome - a (B) Parathyroid hormone
(C) Cytochrome-b (D) CAMP

270. The egg injury factor in raw egg white is

(A) Biotin (B) Avidin
(C) Albumin (D) Calcium salts

271. The following has cyanide:

(A) Vitamin B_{12}
(B) Adenyl cobamide
(C) Benzimidazole cobamide
(D) Methyl cobamide

272. The human species can biosynthesize

(A) Vitamin C (B) Vitamin B_{12}
(C) Thiamine (D) Niacin

273. Retina contains this photosensitive pigment:

(A) Rhodopsin (B) Opsin
(C) Retinol (D) Melanin

274. Anti xerophthalmic vitamin is

(A) Vitamin B_1 (B) Vitamin B_2
(C) Vitamin B_6 (D) Vitamin A

275. One of the following is not a symptom of addison's disease.

(A) Hypoglycemia (B) Hyponatremia
(C) Hypokalemia (D) Hypochoremia

276. Gammaxane is an antimetabolite of

(A) Thiamine (B) Riboflavin
(C) Pyridoxin (D) Inositol

277. Pyridoxin deficiency may lead to convulsions as it is needed for the synthesis of

(A) GABA (B) PABA
(C) EFA (D) SAM

278. Sulpha drugs are antimetabolities of

(A) Vitamin K (B) Pyridoxin
(C) Folic acid (D) Vitamin B_2

279. This abnormal metabolite may be responsible for the neurological manifestation of pernicious anemia:

(A) Taurine (B) Methyl malonic acid
(C) Xantherunic acid (D) Phenyl pyruvic acid

280. The vitamin in leafy vegetables:

(A) D (B) K
(C) A (D) Both (B) and (C)

281. Isonicotinic acid hydrazide given in the treatment of tuberculosis may lead to a deficiency of

(A) Vitamin A (B) Pyridoxin
(C) Folate (D) Inositol

282. Biotin is required for the reaction of CO_2 with

(A) Water
(B) Acetyl CoA
(C) NH_3
(D) Incorporation of carbon 6 in purine

283. A deficiency of folate leads to

(A) Megaloblastic anemia
(B) Aplastic anemia
(C) Pernicious anemia
(D) Hypochromic microcytic anemia

284. A deficiency of Iron leads to

(A) Megaloblastic anemia
(B) Aplastic anemia
(C) Pernicious anemia
(D) Hypochromic microcytic anemia

285. Corninoid coenzymes are coenzymes of

(A) Vitamin B_{12} (B) Vitamin B_6
(C) Vitamin B_2 (D) Vitamin B_1

286. Vitamin B_{12} initially binds to the proteins known as

(A) Transcobalamin I
(B) R-Proteins
(C) Transcobalamin II
(D) Intrinsic factor of castle

287. Extrinsic factor of castle is

(A) Vitamin B_{12} (B) Glycoprotein
(C) R-Proteins (D) Sigma protein

288. Intrinsic factor of castle is

(A) Vitamin B_{12} (B) Glycoprotein
(C) R-Proteins (D) Sigma protein

289. Pernicious means

(A) Prolonged (B) Dangerous
(C) Intermittent (D) Idiopathic

290. Reduction of D-ribonucleotides to D-deoxy ribonucleotides in prokaryotes requires

(A) 5, 6 dimethyl benzimidazole cobamide
(B) Thioredoxin
(C) Tetra hydrobiopterin
(D) Tetra hydrofolate

291. Biotin is also known as

(A) Anti egg white injury factor
(B) Rutin
(C) Both (A) and (B)
(D) None of these

292. Angular stomatosis is due to

(A) Ariboflavinoses
(B) Deficiency of Vitamin C
(C) Deficiency of Vitamin B_1
(D) Deficiency of folate

293. One of the main functions of Vitamin K is cofactor for

(A) Carboxylate for the formation of γ carboxyglutamate
(B) Methylation of δ-adenosyl methionine
(C) Carboxylation of biotin
(D) One carbon transfer by tetrahydrofolate

294. Prothrombin time is prolonged by administering

(A) Vitamin K (B) Dicoumarol
(C) Calcium (D) Prothrombin

295. This vitamin acts as antioxidant.

(A) Vitamin A (B) Vitamin D
(C) Vitamin E (D) Vitamin K

296. This is a photo-labile vitamin.

(A) Thiamine (B) Riboflavin
(C) Niacin (D) Cholecalciferol

297. Convulsive episodes occur when there is a severe deficiency of

(A) Pyridoxine (B) Folic acid
(C) Thiamine (D) Riboflavin

298. Metastatic classification is seen in hypervitaminosis:

(A) A (B) K
(C) D (D) E

299. The anti vitamin for para aminobenzoic acid is

(A) Aminopterin (B) Dicoumarol
(C) Sulphonamides (D) Thiopanic acid

300. Several pantothenic acid deficiency in man has been reported to cause

(A) Burning feet syndrome
(B) Scurvy
(C) Cataract
(D) Xerophthalmia

301. Cholesterol is a precursor in the biogenesis of

(A) Vitamin A (B) Vitamin D
(C) Vitamin E (D) None of these

302. This vitamin is a potent antioxidant of vitamin A:

(A) Vitamin C (B) Vitamin E
(C) Vitamin K (D) Vitamin D

303. In retinal rickets, the following hydroxylation of Vitamin D_3 does not take place:

(A) 25 (B) 1
(C) 24 (D) 7

304. The following does not have phosphorous:

(A) Riboflavin (B) TPP
(C) NAD^+ (D) COASH

305. Convulsions and delirium could be caused by a severe deficiency of

(A) Thiamine (B) Glutamate
(C) Niacin (D) Magnesium

306. Rice polishings contain this vitamin:

(A) Riboflavin (B) Niacin
(C) Thiamine (D) Vitamin B_{12}

307. In beri beri there will be accumulation of _____ in blood.

(A) Aceto acetic acid (B) β-OH butyric acid
(C) Pyruvic acid (D) Methyl malonic acid

308. Symptoms of pellagra are

(A) Dermatitis and diarrhea only
(B) Dermatitis and dementia only
(C) Diarrhea, dermatitis and dementia
(D) Diarrhea and elements only

309. Pyridoxine deficiency leads to

(A) Megaloblastic anemia
(B) Aplastic anemia
(C) Hypochromic microcytic anemia
(D) Permicious anemia

310. The significant ocular lesion in arbo flovinosis:

(A) Keratomalacia
(B) Bitot's spots
(C) Vascularisation of the cornea
(D) lachrymal metaplasia

311. Irradiation of foods raises the content of

(A) Vitamin A (B) Vitamin D
(C) Vitamin E (D) Vitamin K

312. An anti-vitamin for folic acid is

(A) Amethoptesin (B) Dicoumarol
(C) Pyrithoamine (D) Isoniazid

313. Thymine is

(A) Water soluble vitamin
(B) Fat soluble vitamin
(C) Purine base
(D) Pyrimidine base

314. The anti-vitamin for para amino benzoic acid is

(A) Aminopterrin (B) Dicoumarol
(C) INH (D) Sulphonamides

315. The sulphur-containing vitamins among the following B-Vitamin is

(A) Thiamine (B) Riboflavin
(C) Niacin (D) Pyridoxine

316. Taurinuria may be encountered in

(A) Permicious anemia (B) Beriberi
(C) Pellegra (D) Folate deficiency

317. The three vitamins which are specially required for proper nerve functions are acid:

(A) Thiamine, niacin and riboflavin
(B) Thiamine, folic acid, choline
(C) Thiamine, riboflavin, patothenic acid
(D) Thiamine, pyridoxin, vitamin B_{12}

318. This is a rich source for vitamin C.

(A) Rice (B) Milk
(C) Egg (D) Lemon

319. The following vitamin is involved in coenzyme function in transaminations:

(A) Nicotinamide (B) Pyridoxine
(C) Thiamine (D) Riboflavin

320. Methyl malonic aciduria is seen in the deficiency of

(A) Vitamin B_6 (B) Folic acid
(C) Thiamine (D) Vitamin B_{12}

321. Deficiency of Vitamin C leads to

(A) Rickets (B) Scurvy
(C) Night blindness (D) All of these

322. If no primer DNA was given, the following scientist could not have synthesized DNA.

(A) Ochoa (B) Okazaki
(C) Kornberg (D) Monod

323. Antisterility vitamin is

(A) Vitamin B_1 (B) Vitamin B_2
(C) Vitamin E (D) Vitamin K

324. All the following vitamins give rise to cofactors that are phosphorylated in the active form except

(A) Vitamin A (B) Vitamin B_1
(C) Vitamin D (D) Vitamin E

325. Molecular Iron, Fe, is

(A) Stored in the body in combination with Ferritin
(B) Stored primarily in the spleen
(C) Excreted in the urine as Fe^{2+}
(D) absorbed in the intestine by albumin

326. Humans most easily tolerate a lack of which of the following nutrients?

(A) Protein (B) Iodine
(C) Carbohydrate (D) Lipid

327. A deficiency of vitamin B_{12} causes

(A) Cheliosis (B) Beriberi
(C) Pernicious anemia (D) Scurvy

328. In adults a severe deficiency of vitamin D causes

(A) Night blindness (B) Osteomalacia
(C) Rickets (D) Skin cancer

329. Which of the following vitamins would most likely become deficient in a person who develops a completely carnivorous life style?

(A) Thiamine (B) Niacin
(C) Cobalamine (D) Vitamin C

330. Which of the following statements regarding Vitamin A is true?

(A) It is not an essential Vitamin
(B) It is related to tocopherol
(C) It is a component of rhodopsin
(D) It is also known as Opsin

331. Fully activated pyruvate carboxylase depends upon the presence of

(A) Malate and Niacin
(B) Acetyl CoA and biotin
(C) Acetyl CoA and thiamine pyrophosphate
(D) Oxaloacetate and biotin

332. Pantothenic acid is a constituent of coenzyme involved in

(A) Acetylation (B) Decarboxylation
(C) Dehydrogenation (D) Oxidation

333. Biotin is involved in which of the following types of reactions?

(A) Hydroxylation (B) Carboxylation
(C) Decarboxylation (D) Deamination

334. Which of the following vitamins is the precurssor of CoA?

(A) Riboflavin (B) Pantothenate
(C) Thiamine (D) Cobamide

335. Vitamins that function as dinucleotide derivatives include all the following except

(A) Thiamine (B) Niacin
(C) Nicotinate (D) Vitamin B_2

336. Methyl malonic aciduria is seen in a deficiency of

(A) Vitamin B_6 (B) Folic acid
(C) Thiamine (D) Vitamin B_{12}

337. What is the disease caused by thiamine deficiency?

(A) Nyctalopia (B) Scurvy
(C) Rickets (D) Beriberi

338. Retinol and Retinol binding protein are bound with this protein:

(A) Albumin (B) Prealbumin
(C) α-globulin (D) β-globulin

339. Megaloblastic anemia is caused by the deficiency of

(A) Folic acid (B) Vitamin B_6
(C) Iron (D) Protein

340. This vitamin acts as anti oxidant.

(A) Vitamin A (B) Vitamin D
(C) Vitamin E (D) Vitamin K

341. Calcitriol is

(A) 1-hydroxy cholecalciferol
(B) 25-hydroxy cholecalciferol
(C) 24, 25-dihydroxy cholecalciferol
(D) 1, 25-dihydroxy cholecalciferol

342. 1-hydroxylation of 25-hydroxy Vitamin D_3 takes place in

(A) Liver (B) Kidneys
(C) Intestine (D) Pancreas

343. 25-hydroxylation of Vitamin D_3 takes place in

(A) Liver (B) Kidneys
(C) Intestines (D) Pancreas

344. Hydroxylation of 25-hydroxy cholecalciferol is promoted by

(A) Cytochrome A (B) Panthyroid hormone
(C) Cytochrome b (D) cAMP

345. The egg injury factor in raw egg white is

(A) Biotin (B) Avidin
(C) Albumin (D) Calcium salts

346. The following has cyanide:

(A) Vitamin B_{12}
(B) Adenyl cobamide
(C) Benzimidazole cobamide
(D) Methyl cobamide

347. The human species can biosynthesize

(A) Vitamin C (B) Vitamin B_{12}
(C) Thiamine (D) Niacin

348. Retina contains this photo sensitive pigment.

(A) Rhodopsin (B) Opsin
(C) Retinol (D) Malanin

349. Antixerophthalmic vitamin is

(A) Vitamin B_1 (B) Vitamin B_2
(C) Vitamin B_6 (D) Vitamin A

350. One of the following is not symptom of Addison's disease:

(A) Hypoglycemia (B) Hyponatremia
(C) Hypokalemia (D) Hypochloremia

351. Gammaxine is an antimetabolite of

(A) Thiamine (B) Riboflavin
(C) Pyridoxin (D) Inositol

352. Pyridoxine deficiency may lead to convulsions as it is needed for the synthesis of

(A) GABA (B) PABA
(C) EFA (D) SAM

353. Sulpha drugs are antimetabolites of

(A) PABA (B) Pyridoxin
(C) Vitamin B_2 (D) Pantothenic acid

354. This abnormal metabolite may be responsible for the neurological manifestation of pernicious anemia.

(A) Taurine (B) Methyl malonic acid
(C) Xanthurenic acid (D) Phenyl pyruvic acid

355. Choline is not required for the formation of

(A) Lecithins (B) Acetyl choline
(C) Sphingomyelin (D) Cholic acid

356. Isonicotinic acid hydrazide given in the treatment of tuberculosis may lead to a deficiency of

(A) Vitamin A (B) Pyridoxin
(C) Folate (D) Inositol

357. Steroidal prohormone is

(A) Vitamin A (B) Vitamin C
(C) Vitamin D (D) None of these

358. A deficiency of folate leads to

(A) Megaloblastic anemia
(B) Aplastic anemia
(C) Pernicious anemia
(D) Hypochromic microcytic anemia

359. Deficiency of Iron leads to

(A) Megaloblastic anemia
(B) Aplastic anemia
(C) Pernicious anemia
(D) Hypochromic microcytic anemia

360. Corrinoid coenzymes are coenzymes of

(A) Vitamin B_6 (B) Vitamin B_{12}
(C) Vitamin B_2 (D) Vitamin B_1

361. Vitamin B_{12} initially binds to the proteins known as

(A) Transcobalamin I
(B) R-proteins
(C) Transcobalamin II
(D) Intrinsic factor of castle

362. Extrinsic factor of castle is

(A) Vitamin B_{12} (B) Glycoprotein
(C) R-proteins (D) Sigma protein

363. Intrinsic factor of castle is

(A) Vitamin B_{12} (B) Glycoprotein
(C) R-proteins (D) Sigma protein

364. Pernicious means

(A) Prolonged (B) Dangerous
(C) Intermittent (D) Idiopathic

365. Reduction of D-ribonucleotides to D-deoxy ribonucleotides in prokaryotes requires

(A) 5, 6 dimethyl benzimindazole cobamide
(B) Thiredoxin
(C) Tetra hydrobiopterin
(D) Tetra hydrofolate

366. Antirachitic vitamin is

(A) Vitamin A (B) Vitamin D
(C) Vitamin E (D) Vitamin K

367. Angular stomatitis is due to

(A) Ariboflavinosis
(B) Deficiency of Vitamin C
(C) Deficiency of Vitamin B_1
(D) Deficiency of folate

368. One of the main functions of Vitamin K is the cofactor for

(A) Carboxylase for the formation of γ–carboxy glutamate
(B) Methylation by S-adenosyl methionine
(C) Carboxylation by biotin
(D) One carbon transfer by tetra hydrofolate

369. Prothrombin time is prolonged by administering

(A) Vitamin K (B) Dicoumarol
(C) Calcium (D) Prothrombin

370. This Vitamin acts as antioxidant:

(A) Vitamin A (B) Vitamin D
(C) Vitamin E (D) Vitamin K

371. This is photo labile vitamin:

(A) Thiamine (B) Riboflavin
(C) Niacin (D) Cholecalciferol

372. Convulsive episodes occur when there is a severe deficiency of:

(A) Pyridoxine (B) Folic acid
(C) Thiamine (D) Riboflavin

373. Metastatic calcification is seen in hypervitaminosis:

(A) A (B) K
(C) D (D) E

374. The anti-vitamin for para amino benzoic acid is

(A) Aminopterin (B) Dicoumasol
(C) Sulphanomides (D) Thiopamic acid

375. Severe patothemic acid deficiency in man has been reported to cause

(A) Burning feet syndrome
(B) Scurvy
(C) Cataract
(D) Xeropththalmia

376. Cholesterol is a precursor in the biogenesis of

(A) Vitamin A (B) Vitamin D
(C) Vitamin E (D) None of these

377. Which of the vitamins is a potent antioxidant of Vitamin A?

(A) Vitamin C (B) Vitamin E
(C) Vitamin K (D) Vitamin D

378. In renal rickets, the following hydroxylation of Vitamin D_3 does not take place:

(A) 25 (B) 1
(C) 24 (D) 7

379. Which of the following does not have phosphorous?

(A) Riboflavin (B) TPP
(C) NAD^+ (D) CaASH

380. Rice-polishings contain whcih of the following Vitamin?

(A) Riboflavin (B) Niacin
(C) Thiamine (D) Vitamin B_{12}

381. In beri beri there will be accumulation of _____ in blood.

(A) Aceto acetic acid
(B) β–hydroxy butyric acid
(C) Pyruvic acid
(D) Methyl malonic acid

382. Symptoms of pellagra are

(A) Dermatitis and diarrhea only
(B) Dermatitis and Dermentia only
(C) Diarrhea and dermentia only
(D) Diarrhea, Dermatitis and dementia

383. Pyridoxine deficiency leads to

(A) Megaloblastic anemia
(B) Aplastic anemia
(C) Hypochromic microcytic anemia
(D) Pernicious anemia

384. The significant ocular lesion in a riboflavinosis is

(A) Keratomalacia
(B) Bitot's spots
(C) Vascularisation of the cornea
(D) Lachrynal metaplasia

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(A) Water-soluble vitamin
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(D) Pyrimidine base

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(C) INH (D) Sulphanomides

388. The sulphur containing vitamins among the following B Vitamin is

(A) Thiamine (B) Riboflavin
(C) Niacin (D) Pyridoxine

389. Taurinuria may be encountered in

(A) Pernicious anemia (B) Beriberi
(C) Pellegra (D) Folate deficiency

390. The three vitamins which are specially required for proper nerve functions are

(A) Thiamine, Niacin and Riboflavin
(B) Thiamin, Folic acid, Choline
(C) Thiamine, Riboflavin, Pantothenic acid
(D) Thiamine, Pyridoxin, Vitamin B_{12}

391. This is a rich source for Vitamin C:

(A) Rice (B) Milk
(C) Egg (D) Lemon

392. Which ot the following vitamin is involved in coenzyme function in transaminations?

(A) Nicotinamide (B) Pyridoxine
(C) Thiamine (D) Riboflavin

393. Methyl malonic aciduria is seen in a deficiency of

(A) Vitamin B_6 (B) Folic acid
(C) Thiamine (D) Vitamin B_{12}

394. In pernicious anemia, Urine contains high amounts of

(A) Methyl malonic acid (B) FIGLU
(C) VMA (D) 5 HIAA

395. Anti sterility Vitamin is

(A) Vitamin B_1 (B) Vitamin B_2
(C) Vitamin E (D) Vitamin K

396. Biotin deficiency is characterized by the following except

(A) Muscular pain (B) Anaemia
(C) Nausea (D) Dermatitis

397. Deficiency of thiamine causes

(A) Beri beri (B) Scurvy
(C) Night blindness (D) Rickets

398. Deficiency of Vitamin D leads to

(A) Rickets (B) Osteomalacia
(C) Xeropthalmia (D) Both (A) and (B)

399. The vitamin that is useful in cancer is

(A) A (B) B complex
(C) C (D) E

400. Vitamin A over dosage causes injury to

(A) Mitochondria (B) Microtubules
(C) Lysosomes (D) E.R

401. Which is a pro vitamin or vitamin that has antioxidant properties?

(A) Beta carotene (B) Vitamin E
(C) Vitamin C (D) Vitamin D

402. The vitamin required for carboxylation reaction is

(A) Vitamin B_2 (B) Vitamin B_6
(C) Biotin (D) Vitamin B_{12}

403. Biological activity of tocopherols has been attributed in part to their action as

(A) Antioxidant
(B) Anticoagulents
(C) Provitamin
(D) Carriers in electron transport system

404. Biotin is essential for

(A) Translation (B) Carboxylation
(C) Hydroxylation (D) Transamination

405. Which of the following vitamin act as a respiratory catalyst?

(A) B_2 (B) Pyridoxine
(C) B_{12} (D) C

406. Metal in Vitamin B_{12} is

(A) Copper (B) Cobalt
(C) Iron (D) Zinc

407. Whole wheat is an excellent source of

(A) Vitamin D (B) Vitamin C
(C) Vitamin A (D) Thiamine

408. Vitamin used in the treatment of homocystinuria is

(A) B_1 (B) B_5
(C) B_{12} (D) B_6

409. Which of the following is not a component of coenzyme A?

(A) Pantothenic acid (B) Adenylic acid
(C) Acetic acid (D) Sulfhydryl group

410. The most active form of Vitamin D is

(A) 25-Hydroxycholecalciferol
(B) 1, 25-dihydroxycholecalciferol
(C) 25-dihydroxyergocalciferol
(D) None of these

411. The important part in the structure of flavoprotein is

(A) Vitamin B_6 (B) Vitamin B_2
(C) Vitamin B_1 (D) Vitamin A

412. Vitamin essential for transamination is

(A) B_1 (B) B_2
(C) B_6 (D) B_{12}

413. The action of Vitamin K in formation of clotting factor is through

(A) Post transcription
(B) Post translation
(C) Golgi complex
(D) Endoplasmic reticulum

414. Vitamin necessary for CoA synthesis:

(A) Pantothenic acid (B) Vitamin C
(C) B_6 (D) B_{12}

415. Cofactor for transamination is

(A) Thymine (B) Riboflavin
(C) Pyridoxine (D) Niacin

416. During deficiency of thiamine the concentration of the following compound rises in blood and intracellular fluid:

(A) Glycogen (B) Sugar
(C) Amino acids (D) Pyruvic acid

417. The conversion of carotenoids to Vitamin A takes place in

(A) Intestine (B) Liver
(C) Kidney (D) Skin

418. Man cannot synthesize vitamin:

(A) A (B) B
(C) C (D) D

419. Vitamin A is required for the formation of a light receptor protein known as

(A) Globulin (B) Lypoprotein
(C) Chomoprotein (D) Rhodospin

420. Excessive vitamin A in children produces

(A) Irritability (B) Anorexia
(C) Headache (D) All of these

421. Tocopherols prevent the oxidation of

(A) Vitamin A (B) Vitamin D
(C) Vitamin K (D) Vitamin C

422. Vitamin K regulates the synthesis of blood clotting factors.

(A) VII (B) IX
(C) X (D) All of these

423. The colour of cyanomethmoglobin is

(A) Pale yellow (B) Pink
(C) Brown (D) Bright red

424. Transketolase activity is affected in

(A) Bitoin deficiency
(B) Pyridoxine deficiency
(C) PABA deficiency
(D) Thiamine deficiency

425. The hydrolysis of glucose-6-PO_4 is catalyzed by a phosphatase that is not found in which of the following?

(A) Liver (B) Kidney
(C) Muscle (D) Small intestine

426. Vitamin K_2 was originally isolated from

(A) Soyabean (B) Putrid fishmeal
(C) Alfa alfa (D) Oysters

427. The following form of vitamin A is used in the visual cycle:

(A) Retinol (B) Retinoic acid
(C) Retinaldehyde (D) Retinyl acetate

428. Increased carbohydrate consumption increases the dietary requirement for

(A) Thiamine (B) Riboflavine
(C) Pyridoxine (D) Folic acid

429. Increased protein intake is accompanied by an increased dietary requirement for

(A) Thiamine (B) Riboflavine
(C) Folic acid (D) Nicotininic acid

430. The deficiency of which one of the following vitamin causes creatinuria?

(A) Vitamin E (B) Vitamin K
(C) Vitamin A (D) Vitamin B_6

431. A biochemical indication of vitamin B_{12} deficiency can be obtained by measuring the urinary excretion of

(A) Pyruvic acid
(B) Malic acid
(C) Methyl malonic acid
(D) Urocanic acid

ANSWERS

1. A	2. B	3. A	4. A	5. A	6. A
7. D	8. A	9. D	10. A	11. B	12. B
13. A	14. D	15. B	16. C	17. A	18. A
19. A	20. A	21. B	22. D	23. A	24. C
25. C	26. A	27. A	28. A	29. C	30. A
31. D	32. A	33. C	34. C	35. B	36. A
37. C	38. B	39. A	40. D	41. D	42. D
43. A	44. A	45. B	46. C	47. A	48. C
49. B	50. A	51. D	52. C	53. C	54. C
55. D	56. B	57. C	58. A	59. A	60. D
61. B	62. B	63. B	64. B	65. A	66.A
67. B	68. C	69. D	70. A	71. A	72. C
73. C	74. B	75. C	76. A	77. A	78. A
79. C	80. D	81. A	82. D	83. C	84. A
85. C	86. A	87. C	88. A	89. D	90. C
91. A	92. A	93. D	94. A	95. A	96. A
97. C	98. D	99. C	100. B	101. B	102. B
103. D	104. C	105. C	106. B	107. C	108. D
109. A	110. D	111. A	112. D	113. B	114. D
115. A	116. D	117. D	118. C	119. C	120. B
121. C	122. A	123. D	124. D	125. C	126. C
127. A	128. A	129. C	130. D	131. A	132. A
133. D	134. C	135. D	136. D	137. B	138. C
139. C	140. B	141. B	142. B	143. D	144. D
145. C	146. D	147. D	148. B	149. D	150. A
151. C	152. D	153. B	154. D	155. C	156. D
157. A	158. D	159. D	160. D	161. C	162. C
163. C	164. A	165. D	166. C	167. C	168. D
169. A	170. B	171. C	172. B	173. D	174. B
175. D	176. B	177. D	178. B	179. A	180. A
181. D	182. D	183. B	184. A	185. B	186. C
187. D	188. C	189. D	190. C	191. C	192. B
193. C	194. D	195. D	196. C	197. B	198. B
199. B	200. C	201. C	202. D	203. A	204. C
205. A	206. C	207. D	208. D	209. B	210. C
211. C	212. A	213. C	214. D	215. A	216. D
217. D	218. C	219. D	220. D	221. A	222. D
223. B	224. D	225. D	226. C	227. A	228. A
229. B	230. C	231. B	232. A	233. D	234. D
235. B	236. C	237. B	238. D	239. C	240. B
241. B	242. B	243. C	244. C	245. A	246. C

247. D	248. A	249. B	250. C	251. D	252. C
253. B	254. D	255. C	256. B	257. C	258. C
259. A	260. B	261. D	262. D	263. B	264. A
265. C	266. D	267. B	268. A	269. B	270. B
271. A	272. D	273. A	274. D	275. C	276. D
277. A	278. C	279. A	280. D	281. D	282. B
283. B	284. A	285. D	286. B	287. B	288. A
289. B	290. B	291. A	292. B	293. A	294. A
295. B	296. C	297. B	298. A	299. C	300. C
301. A	302. B	303. B	304. A	305. D	306. D
307. C	308. C	309. C	310. B	311. C	312. A
313. D	314. D	315. A	316. A	317. D	318. D
319. B	320. D	321. C	322. C	323. C	324. B
325. A	326. C	327. C	328. B	329. D	330. C
331. B	332. A	333. B	334. B	335. A	336. D
337. D	338. B	339. A	340. D	341. D	342. B
343. A	344. B	345. B	346. A	347. D	348. A
349. D	350. C	351. D	352. A	353. A	354. B
355. D	356. B	357. C	358. A	359. D	360. B
361. B	362. A	363. B	364. B	365. A	366. B
367. A	368. A	369. B	370. C	371. B	372. A
373.C	374. C	375. A	376. B	377. B	378. B
379. A	380. C	381. C	382. D	383. C	384. C
385. A	386. D	387. D	388. A	389. A	390. D
391. D	392. B	393. D	394. A	395. C	396. B
397. A	398. D	399. A	400. C	401. B	402. C
403. B	404. B	405. A	406. B	407. D	408. D
409. C	410. A	411. B	412. C	413. B	414. A
415. C	416. D	417. A	418. C	419. D	420. D
421. A	422. D	423. D	424. D	425. C	426. B
427. C	428. A	429. A	430. C	431. C	

EXPLANATIONS FOR THE ANSWERS

7. D The four fat soluble vitamins (A, D, E, K) are soluble in fats, oils and fat solvents (alcohol, acetone etc.). Their occurrence in the diet, absorption and transport are associated with fat. All the fat soluble vitamins contain one or more of isoprene units (5 carbon units). They can be stored in liver and adipose tissue.

40. D Vitamin A is essential to maintain healthy epithelial tissues and proper immunity. Retinol and retinoic acid functions like steroid hormones. They regulate protein synthesis and thus are involved in cell growth and differentiation. β-Carotene functions as an antioxidant and reduces the risk for heart attack, cancers etc.

77. A The recommended dietary allowances for vitamin D is around 400 I.U. In countries with good sunlight (like India), it is much lower. *i.e.*, 200 I.U. The good sources include fatty fish, fish liver oils, egg yolk.

110. D The earliest symptoms of thiamin deficiency include constipation, appetite suppression, nausea as well as mental depression, peripheral neuropathy and fatigue. Chronic thiamin deficiency leads to more severe neurological symptoms including ataxia, mental confusion and loss of eye coordination. Other clinical symptoms of prolonged thiamin deficiency are related to cardiovascular and muscular defects. The severe thiamin deficiency disease is known as Beriberi.

149. D Riboflavin deficiency is often seen in chronic alcoholics due to their poor diabetic habits. Symptoms associated with riboflavin deficiency include, glossitis, seborrhea, angular stomatitis, cheilosis and photophobia. Riboflavin decomposes when exposed to visible light.

187. D Pyridoxal, pyridoxamine and pyridoxine are collectively known as vitamin B_6. All three compounds are efficiently converted to the biologically active form of vitamin B_6, pyridoxal phosphate. This conversion is catalyzed by the ATP requiring enzyme, pyridoxal kinase.

217. D Isoniazid (anti-tuberculosis drug) and penicillamine (used to treat rheumatoid arthritis and cystinurias) are two drugs that complex with pyridoxal and pyridoxal phosphate resulting in a deficiency in this vitamin.

250. C The liver can store up to six years worth of vitamin B_{12}, hence deficiencies in this vitamin are rare. Penicious anemia is a megaloblastic anemia resulting from vitamin B_{12} deficiency that develops as a result a lack of intrinsic factor in the stomach leading to malabsorption of the vitamin.

291. A Biotin is also called anti-egg white injury factor because, egg white contains a protein called avidin, which combines with biotin in the intestinal tract and prevents absorption of biotin from intestines.

321. B Deficiency in Vitamin C leads to the disease scurvy due to the role of the vitamin in the post-translational modification of collagens. Scurvy is characterized by easily bruised skin, muscle fatigue, soft swollen gums, decreased wound healing and hemorraging, osteoporosis and anemia.

357. C Vitamin D is a steroid prohormone. It is represented by steroids that occur in animals, plants and yeast. Active form of the hormone is 1, 25-dihydroxy vitamin D_3 (1, 25-$(OH)_2D_3$, also termed calcitriol). Calcitriol functions primarily to regulate calcium and phosphorous homeostasis.

398. D The main symptom of vitamin D deficiency in children is rickets and in adults is osteomalacia. Rickets is characterized by improper mineralization during the development of the bones resulting in soft bones. Osteomalacia is characterized by demineralization of previously formed bone leading to increased softness and susceptibility to fracture.

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CHAPTER 6

ENZYMES

1. The compound which has the lowest density is

(A) Chylomicron (B) β-Lipoprotein
(C) α-Lipoprotein (D) pre β-Lipoprotein

2. Non steroidal anti inflammatory drugs, such as aspirin act by inhibiting the activity of the enzyme:

(A) Lipoxygenase (B) Cyclooxygenase
(C) Phospholipase A_2 (D) Lipoprotein lipase

3. From arachidonate, synthesis of prostaglandins is catalysed by

(A) Cyclooxygenase
(B) Lipoxygenase
(C) Thromboxane synthase
(D) Isomerase

4. A Holoenzyme is

(A) Functional unit (B) Apo enzyme
(C) Coenzyme (D) All of these

5. Gaucher's disease is due to the deficiency of the enzyme:

(A) α-Fucosidase (B) β-Galactosidase
(C) β-Glucosidase (D) Sphingomyelinase

6. Neimann-Pick disease is due to the deficiency of the enzyme:

(A) Hexosaminidase A and B
(B) Ceramidase
(C) Ceramide lactosidase
(D) Sphingomyelinase

7. Krabbe's disease is due to the deficiency of the enzyme:

(A) Ceramide lactosidase
(B) Ceramidase
(C) β-Galactosidase
(D) GM1 β-Galactosidase

8. Fabry's disease is due to the deficiency of the enzyme:

(A) Ceramide trihexosidase
(B) Galactocerebrosidase
(C) Phytanic acid oxidase
(D) Sphingomyelinase

9. Farber's disease is due to the deficiency of the enzyme:

(A) α-Galactosidase
(B) Ceramidase
(C) β-Glucocerebrosidase
(D) Arylsulphatase A.

10. A synthetic nucleotide analogue, used in organ transplantation as a suppressor of immunologic rejection of grafts is

(A) Theophylline
(B) Cytarabine
(C) 4-Hydroxypyrazolopyrimidine
(D) 6-Mercaptopurine

11. Example of an extracellular enzyme is

(A) Lactate dehydrogenase
(B) Cytochrome oxidase
(C) Pancreatic lipase
(D) Hexokinase

12. Enzymes, which are produced in inactive form in the living cells, are called

(A) Papain (B) Lysozymes
(C) Apoenzymes (D) Proenzymes

13. An example of ligases is

(A) Succinate thiokinase
(B) Alanine racemase
(C) Fumarase
(D) Aldolase

14 An example of lyases is

(A) Glutamine synthetase
(B) Fumarase
(C) Cholinesterase
(D) Amylase

15. Activation or inactivation of certain key regulatory enzymes is accomplished by covalent modification of the amino acid:

(A) Tyrosine (B) Phenylalanine
(C) Lysine (D) Serine

16. The enzyme which can add water to a carbon-carbon double bond or remove water to create a double bond without breaking the bond is

(A) Hydratase (B) Hydroxylase
(C) Hydrolase (D) Esterase

17. Fischer's 'lock and key' model of the enzyme action implies that

(A) The active site is complementary in shape to that of substance only after interaction.
(B) The active site is complementary in shape to that of substance
(C) Substrates change conformation prior to active site interaction
(D) The active site is flexible and adjusts to substrate

18. From the Lineweaver-Burk plot of Michaelis-Menten equation, Km and Vmax can be determined when V is the reaction velocity at substrate concentration S, the X-axis experimental data are expressed as

(A) 1/V (B) V
(C) 1/S (D) S

19. A sigmoidal plot of substrate concentration ([S]) verses reaction velocity (V) may indicate

(A) Michaelis-Menten kinetics
(B) Co-operative binding
(C) Competitive inhibition
(D) Non-competitive inhibition

20. The K_m of the enzyme giving the kinetic data as below is

(A) –0.50 (B) –0.25
(C) +0.25 (D) +0.33

21. The kinetic effect of purely competitive inhibitor of an enzyme

(A) Increases K_m without affecting V_{max}
(B) Decreases K_m without affecting V_{max}
(C) Increases V_{max} without affecting K_m
(D) Decreases V_{max} without affecting K_m

22. If curve X in the graph (below) represents no inhibition for the reaction of the enzyme with its substrates, the curve representing the competitive inhibition, of the same reaction is

(A) A (B) B
(C) C (D) D

23. An inducer is absent in the type of enzyme:

(A) Allosteric enzyme
(B) Constitutive enzyme
(C) Co-operative enzyme
(D) Isoenzymic enzyme

24. A demonstrable inducer is absent in

(A) Allosteric enzyme (B) Constitutive enzyme
(C) Inhibited enzyme (D) Co-operative enzyme

25. In reversible non-competitive enzyme activity inhibition

(A) V_{max} is increased
(B) K_m is increased
(C) K_m is decreased
(D) Concentration of active enzyme is reduced

26. In reversible non-competitive enzyme activity inhibition

(A) Inhibitor bears structural resemblance to substrate
(B) Inhibitor lowers the maximum velocity attainable with a given amount of enzyme
(C) K_m is increased
(D) K_m is decreased

27. In competitive enzyme activity inhibition

(A) The structure of inhibitor generally resembles that of the substrate
(B) Inhibitor decreases apparent K_m
(C) K_m remains unaffective
(E) Inhibitor decreases V_{max} without affecting K_m

28. In enzyme kinetics V_{max} reflects

(A) The amount of an active enzyme
(B) Substrate concentration
(C) Half the substrate concentration
(D) Enzyme substrate complex

29. In enzyme kinetics Km implies

(A) The substrate concentration that gives one half V_{max}
(B) The dissocation constant for the enzyme substrate comples
(C) Concentration of enzyme
(D) Half of the substrate concentration required to achieve V_{max}

30. In competitive enzyme activity inhibition

(A) Apparent K_m is decreased
(B) Apparent K_m is increased
(C) V_{max} is increased
(D) V_{max} is decreased

31. In non competitive enzyme activity inhibition, inhibitor

(A) Increases K_m (B) Decreases K_m
(C) Does not effect K_m (D) Increases K_m

32. An enzyme catalyzing oxidoreduction, using oxygen as hydrogen acceptor is

(A) Cytochrome oxidase
(B) Lactate dehydrogenase
(C) Malate dehydrogenase
(D) Succinate dehydrogenase

33. The enzyme using some other substance, not oxygen as hydrogen acceptor is

(A) Tyrosinase
(B) Succinate dehydrogenase
(C) Uricase
(D) Cytochrome oxidase

34. An enzyme which uses hydrogen acceptor as substrate is

(A) Xanthine oxidase
(B) Aldehyde oxidase
(C) Catalase
(D) Tryptophan oxygenase

35. Enzyme involved in joining together two substrates is

(A) Glutamine synthetase
(B) Aldolase
(C) Gunaine deaminase
(D) Arginase

36. The pH optima of most of the enzymes is

(A) Between 2 and 4 (B) Between 5 and 9
(C) Between 8 and 12 (D) Above 12

37. Coenzymes are

(A) Heat stable, dialyzable, non protein organic molecules
(B) Soluble, colloidal, protein molecules
(C) Structural analogue of enzymes
(D) Different forms of enzymes

38. An example of hydrogen transferring coenzyme is

(A) CoA (B) NAD^+
(C) Biotin (D) TPP

39. An example of group transferring coenzyme is

(A) NAD^+ (B) $NADP^+$
(C) FAD (D) CoA

40. Cocarboxylase is

(A) Thiamine pyrophosphate
(B) Pyridoxal phosphate
(C) Biotin
(D) CoA

41. A coenzyme containing non aromatic hetero ring is

(A) ATP (B) NAD
(C) FMN (D) Biotin

42. A coenzyme containing aromatic hetero ring is

(A) TPP (B) Lipoic acid
(C) Coenzyme Q (D) Biotin

43. Isoenzymes are

(A) Chemically, immunologically and electrophoretically different forms of an enzyme
(B) Different forms of an enzyme similar in all properties
(C) Catalysing different reactions
(D) Having the same quaternary structures like the enzymes

44. Isoenzymes can be characterized by

(A) Proteins lacking enzymatic activity that are necessary for the activation of enzymes
(B) Proteolytic enzymes activated by hydrolysis
(C) Enzymes with identical primary structure
(D) Similar enzymes that catalyse different reaction

45. The isoenzymes of LDH

(A) Differ only in a single amino acid
(B) Differ in catalytic activity
(C) Exist in 5 forms depending on M and H monomer contents
(D) Occur as monomers

46. The normal value of CPK in serum varies between

(A) 4–60 IU/L (B) 60–250 IU/L
(C) 4–17 IU/L (D) > 350 IU/L

47. Factors affecting enzyme activity:

(A) Concentration (B) pH
(C) Temperature (D) All of these

48. The normal serum GOT activity ranges from

(A) 3.0–15.0 IU/L (B) 4.0–17.0 IU/L
(C) 4.0–60.0 IU/L (D) 0.9–4.0 IU/L

49. The normal GPT activity ranges from

(A) 60.0–250.0 IU/L (B) 4.0–17.0 IU/L
(C) 3.0–15.0 IU/L (D) 0.1–14.0 IU/L

50. The normal serum acid phosphatase activity ranges from

(A) 5.0–13.0 KA units/100 ml
(B) 1.0–5.0 KA units/100 ml
(C) 13.0–18.0 KA units/100 ml
(D) 0.2–0.8 KA units/100 ml

51. The normal serum alkaline phosphatase activity ranges from

(A) 1.0–5.0 KA units/100 ml
(B) 5.0–13.0 KA units/100 ml
(C) 0.8–2.3 KA units/100 ml
(D) 13.0–21.0 KA units/100 ml

52. In early stages of myocardial ischemia the most sensitive indicator is the measurement of the activity of

(A) CPK (B) SGPT
(C) SGOT (D) LDH

53. Serum acid phosphatase level increases in

(A) Metastatic carcinoma of prostate
(B) Myocardial infarction
(C) Wilson's disease
(D) Liver diseases

54. Serum alkaline phosphatase level increases in

(A) Hypothyroidism
(B) Carcinoma of prostate
(C) Hyperparathyroidism
(D) Myocardial ischemia

55. Serum lipase level increases in

(A) Paget's disease (B) Gaucher's disease
(C) Acute pancreatitis (D) Diabetes mellitus

56. Serum ferroxidase level decreases in

(A) Gaucher's disease (B) Cirrhosis of liver
(C) Acute pancreatitis (D) Wilson's disease

57. The isoenzymes LDH_5 is elevated in

(A) Myocardial infarction
(B) Peptic ulcer
(C) Liver disease
(D) Infectious diseases

58. On the third day of onset of acute myocardial infarction the enzyme elevated is

(A) Serum AST (B) Serum CK
(C) Serum LDH (D) Serum ALT

59. LDH_1 and LDH_2 are elevated in

(A) Myocardial infarction
(B) Liver disease
(C) Kidney disease
(D) Brain disease

60. The CK isoenzymes present in cardiac muscle is

(A) BB and MB (B) MM and MB
(C) BB only (D) MB only

61. In acute pancreatitis, the enzyme raised in first five days is

(A) Serum amylase
(B) Serum lactic dehydrogenase
(C) Urinary lipase
(D) Urinary amylase

62. Acute pancreatitis is characterised by

(A) Lack of synthesis of zymogen enzymes
(B) Continuous release of zymogen enzymes into the gut
(C) Premature activation of zymogen enzymes
(D) Inactivation of zymogen enzymes

63. An example of functional plasma enzyme is

(A) Lipoprotein lipase
(B) Amylase
(C) Aminotransferase
(D) Lactate dehydrogenase

64. A non-functional plasma enzyme is

(A) Psudocholinesterase
(B) Lipoprotein lipase
(C) Proenzyme of blood coagulation
(D) Lipase

65. The pH optima for salivary analyse is

(A) 6.6–6.8 (B) 2.0–7.5
(C) 7.9 (D) 8.6

66. The pH optima for pancreatic analyse is

(A) 4.0 (B) 7.1
(C) 7.9 (D) 8.6

67. The pH optima for sucrase is

(A) 5.0–7.0 (B) 5.8–6.2
(C) 5.4–6.0 (D) 8.6

68. The pH optima for maltase is

(A) 1.0–2.0 (B) 5.2–6.0
(C) 5.8–6.2 (D) 5.4–6.0

69. The pH optima for lactase is

(A) 1.0-2.0 (B) 5.4–6.0
(C) 5.0–7.0 (D) 5.8–6.2

70. The substrate for amylase is

(A) Cane sugar (B) Starch
(C) Lactose (D) Ribose

71. The ion which activates salivary amylase activity is

(A) Chloride (B) Bicarbonate
(C) Sodium (D) Potassium

72. The pancreatic amylase activity is increased in the presence of

(A) Hydrochloric acid (B) Bile salts
(C) Thiocyanate ions (D) Calcium ions

73. A carbohydrate which can not be digested in human gut is

(A) Cellulose (B) Starch
(C) Glycogen (D) Maltose

74. The sugar absorbed by facilitated diffusion and requiring Na independent transporter is

(A) Glucose (B) Fructose
(C) Galactose (D) Ribose

75. In the intestine the rate of absorption is highest for

(A) Glucose and galactose
(B) Fructose and mannose
(C) Fructose and pentose
(D) Mannose and pentose

76. Glucose absorption is promoted by

(A) Vitamin A (B) Thiamin
(C) Vitamin C (D) Vitamin K

77. The harmone acting directly on intestinal mucosa and stimulating glucose absorption is

(A) Insulin (B) Glucagon
(C) Thyroxine (D) Vasopressin

78. Given that the standard free energy change ($\Delta G°$) for the hydrolysis of ATP is –7.3 K cal/mol and that for the hydrolysis of Glucose 6-phosphate is –3.3 Kcal/mol, the $\Delta G°$ for the phosphorylation of glucose is Glucose + ATP → Glucose 6–Phosphate + ADP.

(A) –10.6 Kcal/mol (B) –7.3 Kcal/mol
(C) –4.0 Kcal/mol (D) +4.0 Kcal/mol

79. At low blood glucose concentration, brain but not liver will take up glucose. It is due to the

(A) Low K_m of hexokinase
(B) Low K_m of glucokinase
(C) Specificity of glucokinase
(D) Blood brain barrier

80. In the reaction below, Nu TP stands for NuTP + glucose → Glucose 6–Phosphate + NuDP.

(A) ATP (B) CTP
(C) GTP (D) UTP

81. In the figures shown below, fructose 1,6-biphosphate is located at point:

(A) A (B) B
(C) C (D) D

82. The enzyme of the glycolic pathway, sensitive to inhibiton by fluoride ions is

(A) Hexokinase (B) Aldolase
(C) Enolase (D) Pyruvate kinase

83. In glycolytic pathway, iodacetate inhibits the activity of the enzyme:

(A) Phosphotriose isomerase
(B) Glyceraldehyde-3-phosphate dehydrogenase
(C) Pyruvate kinase
(D) Phosphofructokinase

84. In the glycolytic pathway, enolpyruvate is converted to ketopyruvate by

(A) Pyruvate kinase
(B) Phosphoenolpyruvate
(C) Pyruvate dehydrogenase
(D) Spontaneously

85. In erythrocytes, 2, 3-biphosphoglycerate is derived from the intermediate:

(A) Glyeraldehyde-3-phosphate
(B) 1, 3-Biphosphoglycerate
(C) 3-Phosphoglycerate
(D) 2-Phosphoglycerate

86. 2, 3-Biphosphoglycerate in high concentrations, combines with hemoglobin, causes

(A) Displacement of the oxyhemoglobin dissociation curve to the left
(B) Displacement of the oxyhemoglobin dissociation curve to the right
(C) No change in oxy hemoglobin dissociation curve
(D) Increased affinity for oxygen

87. Erythrocytes under normal conditions and microorganisms under anaerobic conditions may accumulate

(A) NADPH
(B) Pyruvate
(C) Phosphoenolpyruvate
(D) Lactate

88. Enzymes leading to the high energy phosphorylation of substrates during glycolysis include which of the following?

(A) Phosphoglycerate kinase
(B) Enolase
(C) Pyruvate Kinase
(D) Glyceraldehyde-3-phosphate dehydrogenase

89. Lineweaver – Burk double reciprocal plot is related to

(A) Substrate concentration
(B) Enzyme activity
(C) Temperature
(D) Both (A) and (B)

90. Phosphofructokinase key enzyme in glycolysis is inhibited by

(A) Citrate and ATP (B) AMP
(C) ADP (D) TMP

91. One of the enzymes regulating glycolysis is

(A) Phosphofructokinase
(B) Glyceraldehyde-3-phosphate dehydrogenase
(C) Phosphotriose isomerase
(D) Phosphohexose isomerase

92. Hexokinase is inhibited in an allosteric manner by

(A) Glucose-6-Phosphate
(B) Glucose-1-Phosphate
(C) Fructose-6-phosphate
(D) Fructose-1, 6-biphosphate

93. A reaction which may be considered an isomerisation is

(A) Glucose 6-Phosphate ⇌ fructose 6 phosphate
(B) 3-Phosphoglycerate ⇌ 2-phosphoglycerate
(C) 2-phosphoglycerate ⇌ phosphoenol-pyruvate
(D) Pyruvate ⇌ Lactate

94. The net number of ATP formed per mole of glucose in anaerobic glycolysis is

(A) 1 (B) 2
(C) 6 (D) 8

95. Pyruvate dehydrogenase a multienzyme complex is required for the production of

(A) Acetyl-CoA
(B) Lactate
(C) Phosphoenolpyruvate
(D) Enolpyruvate

96. Dietary deficiency of thiamin inhibits the activity of the enzyme:

(A) Pyruvate kinase
(B) Pyruvate dehydrogenase
(C) Phosphofructokinase
(D) Enolase

97. Pyruvate dehydrogenase activity is inhibited by

(A) Mercury (B) Zinc
(C) Calcium (D) Sodium

98. In the normal resting state of humans, most of the blood glucose burned as fuel is consumed by

(A) Liver (B) Adipose tissue
(C) Muscle (D) Brain

99. All the enzymes of glycolysis pathway are found in

(A) Extramitochondrial soluble fraction of the cell
(B) Mitochondria
(C) Nucleus
(D) Endoplasmic reticulum

100. Most major metabolic pathways are considered mainly either anabolic or catabolic. Which of the following pathway is most correctly considered to be amphibolic?

(A) Citric acid cycle (B) Gluconeogenesis
(C) Lipolysis (D) Glycolysis

101. The enzymes of the citric acid cycle are located in

(A) Mitochondrial matrix
(B) Extramitochondrial soluble fraction of the cell
(C) Nucleus
(D) Endoplasmic reticulum

102. The initial step of the citric acid cycle is

(A) Conversion of pyruvate to acetyl-CoA
(B) Condensation of acetyl-CoA with oxaloacetate
(C) Conversion of citrate to isocitrate
(D) Formation of α-ketoglutarate catalysed by isocitrate dehydrogenase

103. The substance which may be considered to play a catalytic role in citric acid cycle is

(A) Oxaloacetate (B) Isocitrate
(C) Malate (D) Fumarate

104. An enzyme of the citric acid cycle also found outside the mitochondria is

(A) Isocitrate dehydrogenase
(B) Citrate synthetase
(C) α-Ketoglutarate dehydrogenase
(D) Malate dehydrogenase

105. The reaction catalysed by α-ketoglutarate dehydrogenase in the citric acid cycle requires

(A) NAD (B) NADP
(C) ADP (D) ATP

106. If all the enzymes, intermediates and cofactors of the citric acid cycle as well as an excess of the starting substrate acetyl-CoA are present and functional in an organelle free solution at the appropriate pH, which of the following factors of the citric acid cycle would prove to be rate limiting?

(A) Molecular oxygen
(B) Half life of enzyme
(C) Turnover of intermediates
(D) Reduction of cofactors

107. In TCA cycle, oxalosuccinate is converted to α-ketoglutarate by the enzyme:

(A) Fumarase
(B) Isocitrate dehydrogenase
(C) Aconitase
(D) Succinase

108. The enzyme -ketoglutarate dehydrogenase in the citric acid cycle requires

(A) Lipoate (B) Folate
(C) Pyridoxine (D) Inositol

109. The example of generation of a high energy phosphate at the substrate level in the citric acid cycle is the reaction:

(A) Isocitrate ‡'† α-Ketoglutarate
(B) Succinate ‡'† α-fumarate
(C) Malate ‡'† α-oxaloacetate
(D) Succinyl CoA ‡'† α-Succinate

110. Fluoroacetate inhibits the reaction of citric acid cycle:

(A) Isocitrate ‡'† α-Ketoglutarate
(B) Fumarate ‡'† α-Malate
(C) Citrate ‡'† α-cis-aconitate
(D) Succinate ‡'† α-fumarate

111. Formation of succinyl-CoA from α-Ketoglutarate is inhibited by

(A) Fluoroacetate (B) Arsenite
(C) Fluoride (D) Iodoacetate

112. The number of ATP molecules generated for each turn of the citric acid cycle is

(A) 8 (B) 12
(C) 24 (D) 38

113. Oxidation of one molecule of glucose yields

(A) 12 ATP (B) 24 ATP
(C) 38 ATP (D) 38 ATP

114. Which of the following intermediates of metabolism can be both a precursor and a product of glucose?

(A) Lactate (B) Pyruvate
(C) Alanine (D) Acetyl-CoA

115. Mitochondrial membrane is freely preamble to

(A) Pyruvate (B) Malate
(C) Oxaloacetate (D) Fumarate

116. The reaction of Kreb's cycle which does not require cofactor of vitamin B group is

(A) Citrate ‡'† isocitrate
(B) α-Ketoglutarate ‡'† succinate
(C) Malate ‡'† oxaloacetate
(D) Succinate ‡'† fumarate

117. The coenzyme not involved in the formation of acetyl-CoA from pyruvate is

(A) TPP (B) Biotin
(C) NAD (D) FAD

118. A carrier molecule in the citric acid cycle is

(A) Acetyl-CoA (B) Citrate
(C) Oxaloacetate (D) Malate

119. A specific inhibitor for succinate dehydrogenase is

(A) Arsenine (B) Arsenite
(C) Citrate (D) Fluoride

120. The rate of citric acid cycle is controlled by the allosteric enzyme:

(A) Aconitase
(B) Fumarase
(C) Fumarase
(D) Malate dehydrogenase

121. In the erythrocytes, the net production of ATP molecules by the Rapport-Leubering pathway is

(A) 0 (B) 2
(C) 4 (D) 8

122. The ratio that most closely approximates the number of net molecules of ATP formed per mole of glucose utilized under aerobic conditions to the net number formed under anaerobic conditions is

(A) 4:1 (B) 13:1
(C) 18:1 (D) 24:1

123. The pathway of glycogen biosynthesis involves a special nucleotide of glucose. In the reaction below, NuDP stands for

$NuDP\ Glucose + glycogen_n \rightarrow NuDP + glycogen_{n+1}$

(A) ADP (B) GDP
(C) UDP (D) CDP

124. Glucose 6-phosphate is converted to glucose 1-phosphate in a reaction catalysed by the enzyme phosphoglucomutase, which is

(A) Phosphorylated
(B) Dephosphorylated
(C) Phosphorylated-dephosphorylated
(D) Phosphorylated-dephosphorylatedrephosphorylated

125. The glycogen content of the liver is upto

(A) 6% (B) 8%
(C) 10% (D) 12%

126. In glycogenesis a branch point in the molecule is established by the enzyme

(A) Amylo[1→ 4][1→ 6] transglucosidase
(B) α [1→ 4] α [1→ 4] Glucan transferase
(C) Amylo [1→ 6] glucosidase
(D) Glycogen synthase

127. In glycogenolysis, the enzyme which transfers a trisaccharide unit from one branch to the other exposing 1→ 6 branch point is

(A) Phosphorylase
(B) α-[1→ 4]→ α-[1→ 4]→ Glucan transferase
(C) Amylo [1→ 6] glucosidase
(D) Amylo[1→ 4]→ [1→ 6] transglucosidase

128. In the synthesis of glycogen from glucose the reversible step is

(A) Glucose → glucose 6-phosphate
(B) Glucose 6-phosphate → glucose 1-phosphate
(C) Glucose 1-phosphate → UDP glucose
(D) UDP glucose → glycogen

129. The enzyme glucose-6-phosphatase which catalyses the conversion of glucose 6-phosphate to glucose is not found in

(A) Liver (B) Muscle
(C) Intestine (D) Kidney

130. Allosteric activator of glycogen synthase is

(A) Glucose (B) Glucose-6-Phosphate
(C) UTP (D) Glucose-1-phosphate

131. Action of glycogen synthase is inhibited by

(A) Insulin (B) Glucose
(C) Mg^{2+} (D) Cyclic AMP

132. The hormone activating the glycogen synthase activity is

(A) Insulin (B) Glucagon
(C) Epinephrine (D) ACTH

133. Characteristic features of active site are

(A) Flexible in nature (B) Site of binding
(C) Acidic (D) Both (A) and (B)

134. Von Gierke's disease is characterized by the deficiency of

(A) Glucose-6-phosphatase
(B) α-1 → 4 Glucosidase
(C) 1 → 6 Glucosidase
(D) Liver phosphorylase

135. Cori disease (Limit dextrinosis) is caused due to absence of

(A) Branching enzyme
(B) Debranching enzyme
(C) Glycogen synthase
(D) Phosphorylase

136. Mc Ardle's syndrome is characterized by the absence of

(A) Liver phosphorylase
(B) Muscle phosphorylase
(C) Branching enzyme
(D) Debranching enzyme

137. Pompe's disease is caused due to deficiency of

(A) Lysosomal α-1$\rightarrow$4 and 1$\rightarrow$6-glucosidase
(B) Glucose-6-phosphatase
(C) Glycogen synthase
(D) Phosphofructokinase

138. Amylopectinosis is caused due to absence of

(A) Debranching enzyme
(B) Branching enzyme
(C) Acid maltase
(D) Glucose-6-phosphatase

139. Her's disease is characterized by deficiency of

(A) Muscle phosphorylase
(B) Liver phosphorylase
(C) Debranching enzyme
(D) Glycogen synthase

140. Tarui disease is characterized by the deficiency of the enzyme:

(A) Liver phosphorylase
(B) Muscle phosphorylase
(C) Muscle and erythrocyte phosphofructokinase
(D) Lysosomal acid maltase

141. The hexose monophosphate pathway includes the enzyme:

(A) Maltase dehydrogenase
(B) Hexokinase
(C) α-Ketoglutarate dehydrogenase
(D) Glucose-6-phosphate dehydrogenase

142. The hydrogen acceptor used in pentose phosphate pathway is

(A) NAD (B) NADP
(C) FAD (D) FMN

143. The enzymes of the pentose phosphate pathway are found in the

(A) Cytosol
(B) Mitochondria
(C) Nucleus
(D) Endoplasmic reticulum

144. In pentose phosphate pathway, D-ribulose-5-phosphate is converted to D-ribose-5-phosphate by the enzyme:

(A) Fumarase (B) Ketoisomerase
(C) G-6-PD (D) Epimerase

145. The transketolase enzyme in the pentose phosphate pathway requires the B vitamin.

(A) Pantothenic acid (B) Thiamin
(C) Riboflavin (D) Nicotinic acid

146. Xylulose-5-phosphate serves as a donar of active glycolaldehyde, the acceptor is

(A) Erythrose 4-phosphate
(B) Ribose 5-phosphate
(C) Glyceraldehyde 3-phosphate
(D) Sedoheptulose 7-phosphate

147. Pentose phosphate pathway is of significance because it generates

(A) NADPH for reductive synthesis
(B) Regenerates glucose 6-phosphate
(C) Generates fructose 6-phosphate
(D) Forms glyceraldehyde 3-phosphate

148. The pentose phosphate pathway protects erythrocytes against hemolysis by assisting the enzyme:

(A) Superoxide dismutase
(B) Catalase
(C) Glutathionic peroxidase
(D) Cytochrome oxidase

149. Hemolytic anemia is caused by the deficiency of certain enzymes of the pentose phosphate pathway, the principal enzyme involved is

(A) Glucose-6-phosphate dehydrogenase
(B) Aldolase
(C) Fructose 1, 6-bisphosphatase
(D) Phosphohexose isomerase

150. The sites for gluconeogenesis are

(A) Liver and kidney
(B) Skin and pancreas
(C) Lung and brain
(D) Intestine and lens of eye

151. An enzyme involved in gluconeogenesis is

(A) Pyruvate kinase
(B) Pyruvate carboxylase
(C) Hexokinase
(D) Phosphohexose isomerase

152. The enzyme pyruvate carboxylase is present in

(A) Cytosol (B) Mitochondria
(C) Nucleus (D) Golgi bodies

153. The enzyme phosphoenolpyruvate carboxykinase catalyses the conversion of oxaloacetate to phosphoenolpyruvate requires

(A) ATP (B) ADP
(C) AMP (D) GTP

154. The enzyme glucose 6-phosphatase is present in

(A) Liver (B) Muscle
(C) Adipose tissue (D) Brain

155. In gluconeogensis, an allosteric activator required in the synthesis of oxaloacetate from bicarbonate and pyruvate, which is catalysed by the enzyme pyruvate carboxylase is

(A) Acetyl CoA (B) Succinate
(C) Isocitrate (D) Citrate

156. The number of ATP molecules required to convert 2 molecules of lactate into glucose in mammalian liver is

(A) 2 (B) 4
(C) 5 (D) 6

157. For conjugation with many enogenous and exogenous substances before elimination in urine, the uronic acid pathway provides

(A) Active glucuronate (B) Gulonate
(C) Xylulose (D) Xylitol

158. UDP glucose is converted to UDP glucurronate, a reaction catalysed by UDP glucose dehydrogenase requires

(A) NAD^+ (B) FAD
(C) NADP (D) FMN

159. Pentosuria is a rare hereditary disease is characterized by increased urinary excretion of

(A) L-xylulose
(B) Xylitol
(C) Xylulose 5-phosphate
(D) Ribose 5-phosphate

160. The enzyme involved in essential pentosuria is

(A) Reductase (B) Hydroxylase
(C) Isomerase (D) Racemase

161. Galactose is synthesized from glucose in

(A) Mammary gland (B) Intestine
(C) Kidney (D) Adipose tissue

162. Galactose is readily converted to glucose in

(A) Liver (B) Intestine
(C) Kidney (D) Adipose tissue

163. Galactose 1-phosphate is converted to uridine diphosphate galactose, the reaction is catalysed by the enzyme:

(A) Glactokinase
(B) Galactose 1-phosphate uridyl transferase
(C) Uridine diphospho galactose 4-epimerase
(D) UDP glucose pyrophosphorylase

164. The best known cause of galactosemia is the deficiency of

(A) Galactose 1-phosphate and uridyl transferase
(B) Phosphoglucomutase
(C) Galactokinase
(D) Lactose synthase

165 Conversion of fructose to sorbitol is catalysed by the enzyme:

(A) Sorbitol dehydrogenase
(B) Aldose reductase
(C) Fructokinase
(D) Hexokinase

166. A specific fructokinase present in liver has a very high affinity for its substrate because

(A) K_m for fructose is very high
(B) K_m for fructose is very low
(C) Activity is affected by fasting
(D) Activity is affected by insulin

167. Insulin has no effect on the activity of the enzyme:

(A) Glycogen synthetase
(B) Fructokinase
(C) Pyruvate kinase
(D) Pyruvate dehydrogenase

168. The pathogenesis of diabetic cataract involves accumulation of

(A) Galactose (B) Mannitol
(C) Sorbitol (D) Pyruvate

169. Hereditary fructose intolerance involves the absence of the enzyme:

(A) Aldalose B
(B) Fructokinase
(C) Triokinase
(D) Phosphotriose isomerase

170. Essential fructosuria is characterized by the lack of the hepatic enzyme:

(A) Phosphohexose isomerase
(B) Aldalose A
(C) Aldolase B
(D) Fructokinase

171. In normal individuals glycosuria occurs when the venous blood glucose concentration exceeds

(A) 5–6 mmol/L
(B) 7–8 mmol/L
(C) 8.5–9 mmol/L
(D) 9.5–10 mmol/L

172. Phlorizin inhibits

(A) Renal tubular reabsorption of glucose
(B) Glycolysis
(C) Gluconeogenesis
(D) Glycogenolysis

173. Renal glycosuria is characterized by

(A) Hyperglycemia
(B) Hyperglycemia with glycosuria
(C) Normal blood glucose level with glycosuria
(D) Hyperglycemia with ketosis

174. Acute hemolytic anemia in person's sensitive to the Fava beans is due to the deficiency of the enzyme:

(A) Pyruvate dehydrogenase
(B) G-6-PD
(C) Aconitase
(D) Transketolase

175 Acute hemolytic episode after administration of antimalarial, primaquin, is due to deficiency of the enzyme:

(A) 6-Phosphogluconate dehydrogenase
(B) Glucose-6-phosphate dehydrogenase
(C) Epimerase
(D) Transketolase

176. The pH optima of gastric lipase is

(A) 3.0–6.0 (B) 1.0–2.0
(C) 8.0 (D) 8.6

177. The optimum pH of pancreatic lipase is

(A) 2.0 (B) 4.0
(C) 6.0 (D) 8.0

178. Gastric lipae is activated in the presence of

(A) Bile salts (B) Cu^{++}
(C) K^+ (D) Na^+

179. An example of enzyme inhibition:

(A) Reversible inhibition
(B) Irreversible inhibition
(C) Allosteric inhibition
(D) All of these

180. The formation of Δ^2-trans-enoyl-CoA from acyl-CoA requires the enzyme:

(A) Acyl-CoA synthetase
(B) Acyl-CoA dehydrogenase
(C) 3-Hydroxy acyl-CoA dehydrogenase
(D) Thiolase

181. In β-oxidation 3-ketoacyl-CoA is splitted at the 2, 3 position by the enzyme:

(A) Hydratase (B) Dehydrogenase
(C) Reducatse (D) Thiolase

182. Fatty acids with odd number of carbon atoms yield acetyl-CoA and a molecule of

(A) Succinyl-CoA (B) Propionyl-CoA
(C) Malonyl-CoA (D) Acetoacetyl-CoA

183 For each of the first 7-acetyl-CoA molecules formed by α-oxidation of palmitic acid, the yield of high energy phosphates is

(A) 12 (B) 24
(C) 30 (D) 35

184. The net gain of ATP/mol of palmitic acid on complete oxidation is

(A) 88 (B) 105
(C) 129 (D) 135

185. ω-oxidation is normally a very minor pathway and is brought by hydroxylase enzymes involving

(A) Cytochrome a (B) Cytochrome b
(C) Cytochrome c (D) Cytochrome p-450

186. α-Oxidation i.e., the removal of one carbon at a time from the carboxyl end of the molecule has been detected in

(A) Brain tissue (B) Liver
(C) Adipose tissue (D) Intestine

187. In β-oxidation, the coenzyme for acyl-CoA dehydrogenase is

(A) FMN (B) NAD
(C) NADP (D) FAD

188. The coenzyme involved in dehydrogenation of 3-hydroxy acyl-CoA is

(A) FAD (B) FMN
(C) NAD (D) NADP

189. The concentration of ketone bodies in the blood does not normally exceed

(A) 0.2 mmol/L (B) 0.4 mmol/L
(C) 1 mmol/L (D) 2 mmol/L

190. In humans under normal conditions loss of ketone bodies via urine is usually less than

(A) 1 mg/24 hr (B) 4 mg/24 hr
(C) 8 mg/24 hr (D) 10 mg/24 hr

191. The structure which appears to be the only organ to add significant quantities of ketone bodies to the blood is

(A) Brain (B) Erythrocytes
(C) Liver (D) Skeletal muscle

192. The starting material for ketogenesis is

(A) Acyl-CoA (B) Acetyl-CoA
(C) Acetoacetyl-CoA (D) Malonyl-CoA

193. Enzymes responsible for ketone body formation are associated mainly with the

(A) Mitochondria
(B) Endoplasmic reticulum
(C) Nucleus
(D) Golgi apparatus

194. The synthesis of 3-hydroxy-3-methyl-glutaryl-CoA can occur

(A) Only in mitochondria of all mammalian tissues
(B) Only in the cytosol of all mammalian tissue
(C) In both cytosol and mitochondria
(D) In lysosomes

195. In the pathway leading to biosynthesis of acetoacetate from acetyl-CoA in liver, the immediate precursor of aceotacetate is

(A) Acetoacetyl-CoA
(B) 3-Hydroxybutyryl-CoA
(C) 3-Hydroxy-3-methyl-glutaryl-CoA
(D) 3-Hydroxybutyrate

196. Ketone bodies serve as a fuel for

(A) Extrahepatic tissues
(B) Hepatic tissues
(C) Erythrocytes
(D) Mitochondria

197. In extra hepatic tissues, one mechanism for utilization of acetoacetate involves

(A) Malonyl-CoA (B) Succinyl-CoA
(C) Propionyl-CoA (D) Acetyl-CoA

198. Ketosis reflects

(A) Increased hepatic glucose liberation
(B) Increased fatty acid oxidation
(C) Increased carbohydrate utilisation
(D) Incresed gluconeogenesis

199. Ketosis is associated with the disease:

(A) Nephritis
(B) Diabetes mellitus
(C) Edema
(D) Coronary artery diseases

200. The main pathway for denovo synthesis of fatty acids occur in

(A) Cytosol (B) Mitochondria
(C) Microsomes (D) Nucleus

201. Chain elongation of fatty acids in mammalian liver occurs in

(A) Nucleus (B) Ribosomes
(C) Lysosomes (D) Microsomes

202. Acetyl-CoA is the principal building block of fatty acids. It is produced within the mitochondria and does not diffuse readily into cytosol. The availability of acetyl CoA involves

(A) Carnitine acyl transferase
(B) Pyruvate dehydrogenase
(C) Citrate lyase
(D) Thiolase

203. The synthesis of fatty acids is often termed reductive synthesis.

(A) $NADP^+$ (B) NADH
(C) $FADH_2$ (D) NADPH

204. The protein, which is in fact a multifunctional enzyme complex in higher organism is

(A) Acetyl transacylase
(B) Malonyl transacylase
(C) 3-Hydroxy acyl-ACP dehyratase
(D) Fatty acid synthase

205. The fatty acid synthase complex catalyses

(A) 4 sequential enzymatic steps
(B) 6 sequential enzymatic steps
(C) 7 sequential enzymatic steps
(D) 8 sequential enzymatic steps

206. The main source of reducing equivalents (NADPH) for lipogenesis is

(A) Pentose phosphate pathway
(B) Citric acid cycle
(C) Glycolysis
(D) Glycogenolysis

207. In fatty acids synthase of both bacteria and mammals, ACP (acyl carrier protein) contain the vitamin:

(A) Thiamin (B) Pyridoxine
(C) Riboflavin (D) Pantothenic acid

208. Carboxylation of acetyl-CoA to malonyl-CoA requires the enzyme:

(A) Acetyl-CoA carboxylase
(B) Pyruvate carboxylase
(C) Acetyl transacylase
(D) Acyl CoA-synthetase

209. The rate limiting reaction in the lipogenic pathway is

(A) Acetyl-CoA carboxylase step
(B) Ketoacyl synthase step
(C) Ketoacyl reductase step
(D) Hydratase step

210. Conversion of fatty acyl-CoA to an acyl-CoA derivative having 2 more carbon atoms involves as acetyl donar:

(A) Acetyl-CoA (B) Succinyl-CoA
(C) Propionyl-CoA (D) Malonyl-CoA

211. A cofactor required for the conversion of acetyl-CoA to malonyl-CoA in extramitochondrial fatty acid synthesis is

(A) Biotin (B) FMN
(C) NAD (D) NADP

212. The glycerol for fatty acid esterification in adipocytes is

(A) For the most part, derived from glucose
(B) Obtained primarily from phosphorylation of glycerol by glycerol kinase
(C) Formed from gluconeogenesis
(D) Formed from glycogenolysis

213. In the biosynthesis of triglycerides from glycerol 3-phosphate and acyl-CoA, the first intermediate formed is

(A) 2-Monoacylglycerol
(B) 1, 2-Diacylglycerol
(C) Lysophosphatidic acid
(D) Phosphatidic acid

214. The enzyme glycerol kinase is low activity in

(A) Liver (B) Kidney
(C) Intestine (D) Adipose tissue

215. The common precursor in the biosynthesis of triacylglycerol and phospholipids is

(A) 1, 2-Diacylglycerol phosphate
(B) 1-Acylglycerol 3-phosphate
(C) Glycerol 3-phosphate
(D) Dihydroxyacetone phosphate

216. Synthesis of polyunsaturated fatty acids involves the enzyme systems:

(A) Acyl transferase and hydratase
(B) Desaturase and elongase
(C) Ketoacyl-CoA reductase and hydratase
(D) Dihydroxyacetone phosphate

217. The desaturation and chain elongation system of polyunsaturated fatty acid are enhanced by

(A) Insulin (B) Glucagon
(C) Epinephrine (D) Thyroxine

218. Higher rate of lipogenesis is associated with

(A) High proportion of carbohydrate in diet
(B) Restricted caloric intake
(C) High fat diet
(D) Deficiency of insulin

219. Example of enzyme specificity:

(A) Stereo specificity (B) Reaction specificity
(C) Substrate specificity (D) All of these

220. Phospholipase C attacks the ester bond liberating 1, 2-diacylglycerol and a phosphoryl base at position

(A) 1 (B) 2
(C) Both (A) and (B) (D) 3

221. Synthesis of phosphatidylinositol by transfer of inositol to CDP diacylglycerol is catalysed by the enzyme:

(A) CTP phosphatidate cytidyl transferase
(B) Phosphatidate phosphohydrolase
(C) CDP-diacylglycerol inositol transferase
(D) Choline kinase

222. Synthesis of sphingosine requires the cofactor

(A) NAD (B) NADP
(C) $NADPH^+$ (D) ATP

223. Ceramide is formed by the combination of sphingosine and

(A) Acetyl-CoA (B) Acyl-CoA
(C) Malonyl-CoA (D) Propionyl-CoA

224. The amino alcohol sphingosine is synthesized in

(A) Mitochondria
(B) Cytosol
(C) Nucleus
(D) Endoplasmic reticulum

225. The output of free fatty acids from adipose tissue is reduced by

(A) Insulin (B) Glucagon
(C) Growth hormone (D) Epinephrine

226. The principal action of insulin in adipose tissue is to inhibit the activity of the

(A) Hormone sensitive lipoprotein lipase
(B) Glycerol phosphate acyltransferase
(C) Acetyl-CoA carboxylase
(D) Pyruvate dehydrogenase

227. In non shivering thermogenesis

(A) Glucose is oxidized to lactate
(B) Fatty acids uncouple oxidative phosphorylation
(C) Ethanol is formed
(D) ATP is burned for heat production

228. Brown adipose tissue is

(A) A prominent tissue in human
(B) Characterised by high content of mitochondria
(C) Associated with high activity of ATP synthase
(D) Characterised by low content of cytochromes

229. Fatty liver is caused due to accumulation of

(A) Fatty acids (B) Cholesterol
(C) Phospholipids (D) Triacylglycerol

230. A lipotropic factor is

(A) Choline (B) Palmitic acid
(C) Calcium (D) Vitamin C

231. Fatty liver is also caused by

(A) CH_3Cl (B) CCl_4
(C) Na_2SO_4 (D) Riboflavin

232. All the enzymes involved in the synthesis of cholesterol are found in

(A) Mitochondria
(B) Golgi apparatus
(C) Nucleus
(D) Endoplasmic reticulum and cytosol

233. The source of all the carbon atoms in cholesterol is

(A) Acetyl-CoA (B) Bicarbonate
(C) Propionyl-CoA (D) Succinyl-CoA

234. Two molecules of acetyl-CoA condense to form acetoacetyl-CoA catalysed by

(A) Thiolase (B) Kinase
(C) Reductase (D) Isomerase

235. Acetoacetyl-CoA condenses with one more molecule of acetyl-CoA to form

(A) Mevalonate
(B) Acetoacetate
(C) β-Hydroxybutyrate
(D) 3-Hydroxy 3-methyl-glutaryl-CoA

236. HMG-CoA is converted to mevalonate by reduction catalysed by

(A) HMG-CoA synthetase
(B) HMG-CoA reductase
(C) Mevalonate kinase
(D) Thiolase

237. For reduction enzyme HMG-CoA reductase requires cofactor:

(A) NADPH (B) NADP
(C) NAD (D) FAD

238. In the biosynthesis of cholesterol, the step which controls the rate and locus of metabolic regulation is

(A) Geranyl pyrophosphate farnesyl pyrophosphate
(B) Squalene → lanosterol
(C) HMG CoA → mevalonate
(D) Lanosterol → 1, 4-desmethyl lanosterol

239. The cyclisation of squalene in mammals results in the direct formation of the sterol.

(A) Cholesterol (B) Lanosterol
(C) Sistosterol (D) Zymosterol

240. In the biosynthesis of cholesterol, the rate limiting enzyme is

(A) Mevalonate kinase
(B) HMG-CoA synthetase
(C) HMG-CoA reductase
(D) Cis-prenyl transferase

241. Cholesterol by a feed back mechanism inhibits the activity of

(A) HMG-CoA synthetase
(B) HMG-CoA reductase
(C) Thilase
(D) Mevalonate kinase

242. The activity of HMG-CoA reductase is inhibited by

(A) A fungal inhibitor mevastatin
(B) Probucol
(C) Nicotinic acid
(D) Clofibrate

243. Hypolipidemic drugs reduce serum cholesterol and triacylglycerol. The effect of clofibrate is attributed to

(A) Block in absorption from G.I.T.
(B) Decrease in secretion of triacylglycerol and cholesterol containing VLDL by liver
(C) Block in the reabsorption of bile acids
(D) Decreased synthesis of cholesterol

244. In biosynthesis of cholesterol triparanol inhibits the activity of the enzyme:

(A) Δ^{24} Reductase
(B) Oxidosqualene-lanosterol cyclase
(C) Isomerase
(D) Squalene epoxidase

245. HMG-CoA reductase activity is increased by administration of the hormone:

(A) Insulin (B) Glucagon
(C) Epinephrine (D) Glucocorticoids

246. The principal sterol excreted in feces is

(A) Coprostanol (B) Zymosterol
(C) Lanosterol (D) Desmosterol

247. The principal rate limiting step in the biosynthesis of bile acids is at the

(A) 7-Hydroxylase reaction
(B) 12 α-Hydroxylase reaction
(C) Conjugation reaction
(D) Deconjugation reaction

248. Hypercholesterolemia is found in

(A) Xanthomatosis
(B) Thyrotoxicosis
(C) Hemolytic jaundice
(D) Malabsorption syndrom

249. Hypocholesterolemia is found in

(A) Thyrotoxicosis
(B) Diabetes mellitus
(C) Obstructive jaundice
(D) Nephrotic syndrome

250. The major source of extracellular cholesterol for human tissue is

(A) Very low density lipoprotein
(B) High density lipoprotein
(C) Low density lipoprotein
(D) Albumin

251. Correct ordering of lipoprotein molecules from lowest to the greater density is

(A) LDL, IDL, VLDL, chylomicron
(B) Chylomicron, VLDL, IDL, LDL
(C) VLDL, IDL, LDL, chylomicron
(D) LDL, VLDL, IDL, chylomicron

252. In Hurler's syndrome, urine shows the presence of

(A) Keratan sulphate I
(B) Chondroitin sulphate
(C) Dermatan sulphate and heparan sulphate
(D) Keratan sulphate II

253. Defective enzyme in Hunter's syndrome is

(A) α-L-iduronidase (B) Iduronate sulphatase
(C) Arylsulphatase B (D) C-acetyl transferase

254. In Hunter's syndrome

(A) There is progressive corneal opacity
(B) Keratan sulphate is excreted in the urine
(C) Enzyme defective is arylsulphatase B
(D) Hearing loss is perceptive

255. An important feature of Von-Gierke's disease is

(A) Muscle cramps (B) Cardiac failure
(C) Hypoglycemia (D) Respiratory alkalosis

256. The affected organ in Mc Ardle's syndrome is

(A) Liver (B) Kidney
(C) Liver and Heart (D) Skeletal muscle

257. Refsum's disease is due to deficiency of the enzyme:

(A) Pytantate-α-oxidase
(B) Glucocerebrosidase
(C) Galactocerebrosidase
(D) Ceramide trihexosidase

258. An important finding in Refsum's disease is

(A) Accumulation of ceramide trihexoside in the kidney
(B) Accumulation of phytanic acid in the blood and tissues
(C) Accumulation of gangliosides in brain and spleen
(D) Skin eruptions

259. α-Galactosidase enzyme is defective in

(A) Tay-sach's disease
(B) Refsum's disease
(C) Sandhoff's disease
(D) Fabry's disease

260. The hypothesis to explain enzyme–substrate complex formation:

(A) Lock and key model
(B) Induced fit theory
(C) Proenzyme theory
(D) Both (A) and (B)

261. An important finding in Tay-sach's disease is

(A) Renal failure
(B) Accumulation of gangliosides in brain and spleen
(C) Cardiac failure
(D) Anemia

262. The enzyme deficient in Krabbe's disease is

(A) Hexosaminidase A (B) Arylsuphatase A
(C) β-Galactosidase (D) α-Fucosidase

263. The enzyme ceramidase is deficient in

(A) Farber's disease (B) Fabry's disease
(C) Sandhoff's disease (D) Refsum's disease

264. Niemann-Pick disease is due to deficiency of the enzyme

(A) Ceramidase
(B) Glucocerebrosidase
(C) Galactocerebrosidase
(D) Sphingomyelinase

265. Wolman's disease is due to deficiency of

(A) Cholesteryl ester hydrolase
(B) Hexosaminidase A
(C) α-Fucosidase
(D) Arylsulphatase A

266. The enzyme deficient in Sandhoff's disease is

(A) α-Fucosidase
(B) Hexosaminidase A and B
(C) β-Galactosidase
(D) β-Glucosidase

267. Jamaican vomiting sickness is due to inactivation of the enzyme

(A) Pyruvate carboxylase
(B) Acyl-Co-A synthetase
(C) Acyl-Co-A dehydrogense
(D) Thiolase

268. Zellweger's syndrome is due to inherited absence of

(A) Peroxisomes
(B) Phospholipase A_1
(C) Acyl-Co-A dehydrogenase
(D) Thiolase

269. Bassen-Kornzweig syndrome is due to

(A) Absence of Apo-C-II
(B) Defect in Apo-B synthesis
(C) Absence of Apo-E
(D) Absence of Apo-D

270. Enzyme deficient in Hyperammonemia type II is

(A) Glutamine synthetase
(B) Glutaminase
(C) Ornithine transcarbamoylase
(D) Carbamoylphosphate synthetase

271. An important finding in Hyperammonemia type II is

(A) Increased serum gluatmine level
(B) Enlarged liver
(C) Mental retardation
(D) Increased carbamoyl phosphate synthetase level

272. Absence of the enzyme argininosuccinate synthetase causes

(A) Argininosuccinic aciduria
(B) Hyperargininemia
(C) Tricorrhexis nodosa
(D) Citrullinemia

273. Tricorrhexis nodosa is a characteristic finding of

(A) Argininosuccinic aciduria
(B) Citrullinemia
(C) Phenylketonuria
(D) Hyperargininemia

274. Elevated blood argininosuccinate level is found in

(A) Hyperargininemia
(B) Argininosuccinic aciduria
(C) Citrullinemia
(D) Tyrosinosis

275. Hyperargininemia, a defect in urea synthesis develops due to deficiency of the enzyme:

(A) Ornithine transcarbamoylase
(B) Argininosuccinase
(C) Arginase
(D) Argininosuccinate synthetase

276. Albinism is due to deficiency of the enzyme:
(A) Phenylalanine hydroxylase
(B) Tyrosinase
(C) p-Hydroxyphenylpyruvic acid oxidase
(D) Tyrosine dehydrogenase

277. Neonatal tyrosinemia is due to deficiency of the enzyme:
(A) p-Hydroxyphenylpyruvate hydroxylase
(B) Fumarylacetoacetate hydrolase
(C) Phenylalanine hydroxylase
(D) Tyrosine dehydrogenase

278. Which of the following is a substrate-specific enzyme?
(A) Hexokinase (B) Thiokinase
(C) Lactase (D) Aminopeptidase

279. Coenzymes combine with
(A) Proenzymes (B) Apoenzymes
(C) Holoenzymes (D) Antienzymes

280. Coenzymes are required in which of the following reactions?
(A) Oxidation-reduction
(B) Transamination
(C) Phosphorylation
(D) All of these

281. Which of the following coenzyme takes part in hydrogen transfer reactions?
(A) Tetrahydrofolate (B) Coenzyme A
(C) Coenzyme Q (D) Biotin

282. Which of the following coenzyme takes part in oxidation-reduction reactions?
(A) Pyridoxal phosphate
(B) Lipoic acid
(C) Thiamin diphosphate
(D) None of these

283. In conversion of glucose to glucose-6-phsophate, the coenzyme is
(A) Mg^{++}
(B) ATP
(C) Both (A) and (B)
(D) None of these

284. A coenzyme required in transamination reactions is
(A) Coenzyme A (B) Coenzyme Q
(C) Biotin (D) Pyridoxal phosphate

285. Coenzyme A contains a vitamin which is
(A) Thiamin (B) Ascorbic acid
(C) Pantothenic acid (D) Niacinamide

286. Cobamides contain a vitamin which is
(A) Folic acid (B) Ascorbic acid
(C) Pantothenic acid (D) Vitamin B_{12}

287. A coenzyme required in carboxylation reactions is
(A) Lipoic acid (B) Coenzyme A
(C) Biotin (D) All of these

288. Which of the following coenzyme takes part in tissue respiration?
(A) Coenzyme Q (B) Coenzyme A
(C) NADP (D) Cobamide

289. The enzyme hexokinase is a
(A) Hydrolase (B) Oxidoreductase
(C) Transferase (D) Ligase

290. Which of the following is a proteolytic enzyme?
(A) Pepsin (B) Trypsin
(C) Chymotrypsin (D) All of these

291. Enzymes which catalyse binding of two substrates by covalent bonds are known as
(A) Lyases (B) Hydrolases
(C) Ligases (D) Oxidoreductases

292. The induced fit model of enzyme action was proposed by
(A) Fischer (B) Koshland
(C) Mitchell (D) Markert

293. Allosteric inhibition is also known as
(A) Competitive inhibition
(B) Non-competitive inhibition
(C) Feedback inhibition
(D) None of these

294. An allosteric enzyme is generally inhibited by

(A) Initial substrate of the pathway
(B) Substrate analogues
(C) Product of the reaction catalysed by allosteric enzyme
(D) Product of the pathway

295. When the velocity of an enzymatic reaction equals V_{max}, substrate concentration is

(A) Half of K_m (B) Equal to K_m
(C) Twice the K_m (D) Far above the K_m

296. In Lineweaver-Burk plot, the y-intercept represents

(A) V_{max} (B) K_m
(C) K_m (D) $1/K_m$

297. In competitive inhibition, the inhibitor

(A) Competes with the enzyme
(B) Irreversibly binds with the enzyme
(C) Binds with the substrate
(D) Competes with the substrate

298 Competitive inhibitors

(A) Decrease the K_m (B) Decrease the V_{max}
(C) Increase the K_m (D) Increase the V_{max}

299. Competitive inhibition can be relieved by raising the

(A) Enzyme concentration
(B) Substrate concentration
(C) Inhibitor concentration
(D) None of these

300. Physostigmine is a competitive inhibitor of

(A) Xanthine oxidase
(B) Cholinesterase
(C) Carbonic anhydrase
(D) Monoamine oxidase

301. Carbonic anhydrase is competitively inhibited by

(A) Allopurinol (B) Acetazolamide
(C) Aminopterin (D) Neostigmine

302. Serum lactate dehydrogenase rises in

(A) Viral hepatitis
(B) Myocardial infarction
(C) Carcinomatosis
(D) All of these

303. Which of the following serum enzyme rises in myocardial infarction:

(A) Creatine kinase (B) GOT
(C) LDH (D) All of these

304. From the following myocardial infarction, the earliest serum enzyme to rise is

(A) Creatine Kinase (B) GOT
(C) GPT (D) LDH

305. Proenzymes:

(A) Chymotrysinogen (B) Pepsinogen
(C) Both (A) and (B) (D) None of these

306. Alkaline phosphatase is present in

(A) Liver (B) Bones
(C) Placenta (D) All of these

307. Which of the following isoenzyme of lactate dehydrogenase is raised in serum in myocardial infarction:

(A) LD_1 (B) LD_2
(C) LD_1 and LD_2 (D) LD_5

308. Enzymes which are always present in an organism are known as

(A) Inducible enzymes
(B) Constitutive enzymes
(C) Functional enzymes
(D) Apoenzymes

309. Inactive precursors of enzymes are known as

(A) Apoenzymes (B) Coenzymes
(C) Proenzymes (D) Holoenzymes

310. Whcih of the following is a proenzyme?

(A) Carboxypeptidase
(B) Aminopeptidase
(C) Chymotrypsin
(D) Pepsinogen

311. Allosteric enzymes regulate the formation of products by

(A) Feedback inhibition
(B) Non-competitive inhibition
(C) Competitive inhibition
(D) Repression-derepression

312 Regulation of some enzymes by covalent modification involves addition or removal of

(A) Acetate (B) Sulphate
(C) Phosphate (D) Coenzyme

313. Covalent modification of an enzyme generally requires a

(A) Hormone (B) cAMP
(C) Protein kinase (D) All of these

314. An inorganic ion required for the activity of an enzyme is known as

(A) Activator (B) Cofactor
(C) Coenzyme (D) None of these

315. The first enzyme found to have iso-enzymes was

(A) Alkaline Phosphatase
(B) Lactate dehydrogenase
(C) Acid Phosphatase
(D) Creatine kinase

316. Lactate dehydrogenase is located in

(A) Lysosomes (B) Mitochondria
(C) Cytosol (D) Microsomes

317. Lactate dehydrogenase is a

(A) Monomer (B) Dimer
(C) Tetramer (D) Hexamer

318. Ceruloplasmin is absent in

(A) Cirrhosis of liver (B) Wilson's disease
(C) Menke's disease (D) Copper deficiency

319. Ceruloplasmin oxidizes

(A) Copper (B) Iron
(C) Both (A) and (B) (D) None of these

320. Creatine kinase is present in all of the following except

(A) Liver (B) Myocardium
(C) Muscles (D) Brain

321. Alkaline phosphatase is present in

(A) Liver (B) Bones
(C) Intestinal mucosa (D) All of these

322. All of the following are zinc-containing enzymes except

(A) Acid Phosphatase
(B) Alkaline Phosphatase
(C) Carbonic anhydrase
(D) RNA polymerase

323. All of the following are iron-containing enzymes except

(A) Carbonic anhydrase
(B) Catalase
(C) Peroxidase
(D) Cytochrome oxidase

324. Biotin is a coenzyme for

(A) Pyruvate dehydrogenase
(B) Pyruvate carboxylase
(C) PEP carboxykinase
(D) Glutamate pyruvate transminase

325. Enzymes accelerate the rate of reactions by

(A) Increasing the equilibrium constant of reactions
(B) Increasing the energy of activation
(C) Decreasing the energy of activation
(D) Decreasing the free energy change of the reaction

326. Kinetics of an allosteric enzyme are explained by

(A) Michaelis-Menten equation
(B) Lineweaver-Burk plot
(C) Hill plot
(D) All of these

327. Covalent modification of an enzyme usually involves phosphorylation / dephosphorylation of

(A) Serine residue
(B) Proline residue
(C) Hydroxylysine residue
(D) Hydroxyproline residue

328. V_{max} of an enzyme may be affected by

(A) pH
(B) Temperature
(C) Non-competitive inhibitors
(D) All of these

329. In enzyme assays, all the following are kept constant except

(A) Substrate concentration
(B) Enzyme concentration
(C) pH
(D) Temperature

330. If the substrate concentration is much below the km of the enzyme, the velocity of the reaction is

(A) Directly proportional to substrate concentration
(B) Not affected by enzyme concentration
(C) Nearly equal to V_{max}
(D) Inversely proportional to substrate concentration

331. Enzymes requiring NAD as co-substrate can be assayed by measuring change in absorbance at

(A) 210 nm (B) 290 nm
(C) 340 nm (D) 365 nm

332. Different isoenzymes of an enzyme have the same

(A) Amino acid sequence
(B) Michaelis constant
(C) Catalytic activity
(D) All of these

333. From the pentapeptide, phe-ala-leu-lys-arg, phenylalanine residue is split off by

(A) Trypsin (B) Chymotrypsin
(C) Aminopeptidase (D) Carboxypeptidase

334. A high-energy phosphate among the following is

(A) Glucose-6-phosphate
(B) Glucose-1-phosphate
(C) 1, 3-Biphoglycerate
(D) All of these

335. The highest energy level is present amongst the following in

(A) 1, 3-Biphosphoglycerate
(B) Creatine phosphate
(C) Carbamoyl phosphate
(D) Phosphoenol pyruvate

336. Daily urinary urobilinogen excretion in adult men is

(A) 0–4 mg (B) 5–8 mg
(C) 9–12 mg (D) 13–20 mg

337. In obstructive jaundice, faecal urobilinogen is

(A) Absent (B) Decreased
(C) Increased (D) Normal

338. Acetyl-CoA can be formed from

(A) Pyruvate (B) Fatty acids
(C) ketone bodies (D) All of these

339. Pyruvate is converted into acetyl-CoA by

(A) Decarboxylation
(B) Dehydrogenation
(C) Oxidative decarboxylation
(D) Oxidative deamination

340. Conversion of pyruvate into acetyl CoA is catalysed by

(A) Pyruvate dehydrogenase
(B) Didrolipoyl acetyl transferase
(C) Dihydrolipoyl dehydrogenase
(D) All the 3 acting in concert

341. Pyruvate dehydrogenase complex is located in

(A) Cytosol
(B) Lysosomes
(C) Mitochondria
(D) Endoplasmic reticulum

342. A flavoprotein in pyruvate dehydrogenase complex is

(A) Pyruvate dehydrogenase
(B) Didrolipoyl acetyl transferase
(C) Dihydrolipoyl dehydrogenase
(D) None of these

343. Pyruvate dehydrogenase complex is regulated by

(A) Covalent modification
(B) Allosteric regulation
(C) Both (A) and (B)
(D) None of these

344. An allosteric inhibitor of pyruvate dehydrogenase is

(A) Acetyl CoA (B) ATP
(C) NADH (D) Pyruvate

345. Ribozymes:

(A) RNA enzyme (B) Non-protein enzymes
(C) Catalyst function (D) All of these

346. In citric acid cycle, NAD is reduced in

(A) One reactions (B) Two reactions
(C) Three reactions (D) Four reactions

347. Among citric acid cycle enzymes, a flavoprotein is

(A) Malate
(B) Fumarase
(C) Succinate dehrogenase
(D) Isocitrate dehrogenase

348. In citric acid cycle, GDP is phosphorylated by

(A) Succinate dehydrogenase
(B) Aconitase
(C) Succinate thiokinase
(D) Fumarse

349. Malonate is an inhibitor of

(A) Malate dehydrogenase
(B) α-Ketoglutarate dehydrogenase
(C) Succinate dehydrogenase
(D) Isocitrate dehydrogenase

350. Isocitrate dehydrogenase is allosterically inhibited by

(A) Oxalosuccinate (B) α-Ketoglutarate
(C) ATP (D) NADH

351. All of the following are allosteric enzymes except

(A) Citrate synthetase
(B) a-Ketoglutarate dehdrogenase
(C) Succinate thiokinase
(D) Succinate dehydrogenase

352. All of the following are intermediates of citric acid cycle except

(A) Oxalosuccinate (B) Oxaloacetate
(C) Pyruvate (D) Fumarate

353. All of the following intermediates of citric acid cycle can be formed from amino acids except

(A) α-Ketoglutarate (B) Fumarate
(C) Malate (D) Oxaloacetate

354. Glycolytic pathway is located in

(A) Mitochondria (B) Cytosol
(C) Microsomes (D) Nucleus

355. End product of aerobic glycolysis is

(A) Acetyl CoA (B) Lactate
(C) Pyruvate (D) CO_2 and H_2O

356. During fasting, glucose is phosphorylated mainly by

(A) Hexokinase (B) Glucokinase
(C) Both (A) and (B) (D) None of these

357. Glucokinase is found in

(A) Muscles (B) Brain
(C) Liver (D) All of these

358. In anaerobic glycolysis, energy yield from each molecule of glucose is

(A) 2 ATP equivalents (B) 8 ATP equivalents
(C) 30 ATP equivalents (D) 38 ATP equivalents

359. Which of the following is an allosteric enzyme?

(A) Phosphohexose isomerase
(B) Phosphotriose isomerase
(C) Lactate dehydrogenase
(D) Phosphofructokinase

360. Glycolysis is anaerobic in

(A) Liver (B) Brain
(C) Kidneys (D) Erythrocytes

361. Phosphofructokinase is allosterically inhibited by

(A) Fructose-1, 6-biphosphate
(B) Lactate
(C) Pyruvate
(D) Citrate

362. Glucose-6-phosphate is an allosteric inhibitor of

(A) Glucokinase
(B) Hexokinase
(C) Phosphohexose isomerase
(D) None of these

363. ATP is a co-substrate as well as an allosteric inhibitor of

(A) Phosphofructokinase
(B) Hexokinase
(C) Glucokinase
(D) None of these

364. Complete oxidation of one molecule of glucose into CO_2 and H_2O yields

(A) 8 ATP equivalents
(B) 15 ATP equivalents
(C) 30 ATP equivalents
(D) 38 ATP equivalents

365. A unique by-product of glycolysis in erythrocytes is

(A) Lactate
(B) 1, 3-Biphosphoglycerate
(C) 2, 3-Biphosphoglycerate
(D) All of these

366. Which of the following enzymes incorporates inorganic phosphate into the substrate?

(A) Phosphoglycerate kinase
(B) Glyceraldehyde-3-phosphate dehydrogenase
(C) Pyruvate kinase
(D) Enolase

367. Rapoport-Luebering cycle is located in

(A) Liver (B) Muscles
(C) Brain (D) Erythrocytes

368. Glycerol can enter glycolytic pathway via

(A) Dihydroxyacetone phosphate
(B) 1, 3-Biphospoglycerate
(C) 3-Phosphoglycerate
(D) 2-Phosphoglycerate

369. HMP shunt is present in

(A) Erythrocytes (B) Liver
(C) Testes (D) All of these

370. Glucose-6-phosphate dehydrogenase is induced by

(A) 6-Phosphogluconolactone
(B) Glucose-6-phosphate
(C) Ribose-5-phosphate
(D) Insulin

371. The decarboxylation reaction in HMP shunt is catalysed by

(A) Gluconolactone hydrolase
(B) 6-Phosphogluconate dehydrogenase
(C) 6-Phosphogluconate decarboxylase
(D) Transaldolase

372. The first pentose formed in HMP shunt is

(A) Ribose-5-phosphate (B) Ribulose-5-phosphate
(C) Xylose-5-phosphate (D) Xylulose-5-phosphate

373. The regulatory enzyme in HMP shunt is

(A) Glucose-6-phosphate dehydrogenase
(B) 6-Phosphogluconate dehydrogenase
(C) Both (A) and (B)
(D) None of these

374. The rate of HMP shunt reactions is

(A) Increased by Insulin
(B) Increased in diabetes mellitus
(C) Increased by glucagons
(D) Increased in starvation

375. Glycogenesis requires

(A) GTP (B) CTP
(C) UTP (D) None of these

376. Glycogen synthetase catalyses the formation of

(A) α–1, 4-Glycosidic bonds
(B) α–1, 6-Glycosidic bonds
(C) Both (A) and (B)
(D) None of these

377. Glycogenoloysis is increased by

(A) Glucagon (B) Insulin
(C) Epinephrine (D) cAMP

378. Hepatic glycogenoloysis is increased by

(A) Insulin (B) Glucagon
(C) Epinephrine (D) Glucocorticoids

379. Glycogen phosphorylase liberates the following from glycogen

(A) Glucose
(B) Glucose-6-phosphate
(C) Glucose-1-phosphate
(D) Maltose

380. After the action of phosphorylase, glycogen is converted into

(A) Amylopectin (B) dextrin
(C) Amylose (D) Maltose

381. Glucose-1-phosphate liberated from glycogen cannot be converted into free glucose in

(A) Liver (B) Kidneys
(C) Muscles (D) Brain

382. A coenzyme present in phosphorylase is

(A) NAD
(B) Pyridoxal phosphate
(C) Thiamin pyrophosphate
(D) Coenzyme A

383. If glucose-1-phosphate formed by glycogenoloysis in muscles is oxidized to CO_2 and H_2O, the energy yield will be

(A) 2 ATP equivalents (B) 3 ATP equivalents
(C) 4 ATP equivalents (D) 8 ATP equivalents

384. A molecule of phosphorylase kinase is made up of

(A) 4 subunits (B) 8 subunits
(C) 12 subunits (D) 16 subunits

385. Cyclic AMP binds to

(A) Catalytic subunits of protein kinase
(B) Regulatory subunits of protein kinase
(C) Catalytic subunits of phosphorylase kinase
(D) Regulatory subunits of phosphorylase kinase

386. Glucose is the only source of energy for

(A) Myocardium (B) Kidneys
(C) Erythrocytes (D) Thrombocytes

387. Glycerol-3-phosphate for the synthesis of triglycerides in adipose tissue is derived from

(A) Phosphatidic acid (B) Diacylglycerol
(C) Glycerol (D) Glucose

388. Gluconeogenesis does not occur in

(A) Brain (B) Kidneys
(C) Muscles (D) Liver

389. Glucose cannot be synthesized from

(A) Glycerol (B) Lactate
(C) Alanine (D) Leucine

390. Coenzyme for phosphoenolpyruvate carboxykinase is

(A) ATP (B) ADP
(C) GTP (D) GDP

391. Therapeutic enzymes:

(A) Streptokinase (B) Asparaginase
(C) Riboflavinase (D) Both (A) and (B)

392. A gluconeogenic enzyme among the following is

(A) Phosphofructokinase
(B) Pyruvate kinase
(C) Phosphoenol pyruvate carboxykinase
(D) Glucokinase

393. Glucose-6-phosphatase and PEP carboxy kinase are regulated by

(A) Covalent modification
(B) Allosteric regulation
(C) Induction and repression
(D) All of these

394. The maximum possible chain length of fatty acids formed in the pathway of de novo synthesis is

(A) 16 Carbon atoms (B) 18 Carbon atoms
(C) 20 Carbon atoms (D) 24 Carbon atoms

395. Acetyl CoA required for de novo synthesis of fatty acids is obtained from

(A) Breakdown of existing fatty acids
(B) Ketone bodies
(C) Acetate
(D) Pyruvate

396. Formation of acetyl CoA from pyruvate for de novo synthesis of fatty acids requires

(A) Pyruvate dehydrogenase complex
(B) Citrate synthetase
(C) ATP citrate lyase
(D) All of these

397. The major site for elongation of medium chain fatty acids is

(A) Mitochondria (B) Cytosol
(C) Microsomes (D) All of these

398. β-oxidation of fatty acids is inhibited by

(A) NADPH (B) Acetyl CoA
(C) Malonyl CoA (D) None of these

399. The enzyme regulating extramitochondrial fatty acid synthesis is

(A) Thioesterase
(B) Acetyl CoA carboxylase
(C) Acyl transferase
(D) Multi-enzyme complex

400. Acetyl CoA carboxylase is activated by

(A) Citrate (B) Insulin
(C) Both (A) and (B) (D) None of these

401. All the following statements about acetyl CoA carboxylase are true except:

(A) It is activated by citrate
(B) It is inhibited by palmitoyl CoA
(C) It can undergo covalent modification
(D) Its dephosphorylated form is inactive

402. All the following statements about acetyl CoA carboxylase are true except

(A) It is required for de novo synthesis of fatty acids
(B) It is required for mitochondrial elongation of fatty acids
(C) It is required for microsomal elongation of fatty acids
(D) Insulin converts its inactive form into its active form

403. Both Acyl carrier protein (ACP) of fatty acid synthetase and coenzyme (CoA) are

(A) Contain reactive phosphorylated
(B) Contain thymidine
(C) Contain phosphopantetheine reactive groups
(D) Contain cystine reactive groups

404. Which one of the following transfers acyl groups?

(A) Thiamine pyrophosphate
(B) Lipomide
(C) ATP
(D) NADH

405. Which one of the following cofactors must be utilized during the conversion of acetyl CoA to malonyl CoA?

(A) TPP (B) ACP
(C) NAD^+ (D) Biotin

406. Which one of the following enzymes requires a coenzyme derived from the vitamin whose structure is shown below?

(A) Enoyl CoA hydratase
(B) Phosphofructokinase
(C) Glucose-6-phosphatase
(D) Glucose-6-phosphate dehydrogenase

407. Coenzymes derived from the vitamin shown below are required by enzymes involved in the synthesis of which of the following?

(A) ATP (B) UTP
(C) CTP (D) NADH

408. Coenzymes derived from the vitamin shown below are required by which of the following enzymes?

(A) Lactate dehydrogenase
(B) Glutamate dehydrogenase
(C) Pyruvate dehydrogenase
(D) Malate dehydrogenase

409. All the following are coenzymes except

(A) Ubiquinone
(B) CoA
(C) Pyruvate dehydrogenase
(D) Lipoic acid

410. Which of the following is not a cofactor?

(A) Mg (B) Iron
(C) Cu (D) Methylcobalamine

411. All the following compounds are members of the electron transport chain except

(A) Ubiquinone (B) Carnitine
(C) NAD (D) FAD

412. Thiamine is essential for

(A) Pyruvate dehydrogenase
(B) Isocitrate dehydrogenase
(C) Succinate dehydrogenase
(D) Acetyl CoA synthetase

413. Adenylate cyclase is activated by

(A) Insulin (B) Glucagon
(C) Prostaglandin E_1 (D) Ca^{2+} ions

414. Maximum enzyme activity is observed at

(A) Acidic pH (B) Neutral pH
(C) Basic pH (D) Optimum pH

415. Which of the following is known as bone forming enzyme?

(A) Alkaline phosphatase
(B) Acid phosphatase
(C) Leucine aminopeptidase
(D) γ-glutamyl transpeptidase

416. Conversion of pepsinogen to pepsin is

(A) Intra molecular rearrangement
(B) Breaking of hydrogen bonds
(C) Covalent modification
(D) Polymerisation

417. Which of the following is not having an apoenzyme and coenzyme?

(A) Lactate dehydrogenase
(B) Succinate dehydrogenase
(C) Malate dehydrogenase
(D) Pepsin

418. Pyruvate dehydrogenase is a/an

(A) Isomerase (B) Lyase
(C) Ligase (D) Oxido reductase

419. Homogentisic oxidase is an

(A) Oxidase
(B) Monooxygenase
(C) Dioxygenase
(D) Anaerotic dehydrogenase

420. Isocitrate dehydrogenase can use _____ as a cofactor.

(A) NAD^+ only (B) $NADP^+$ only
(C) NAD^+ or $NADP^+$ (D) FMN and FAD

421. The rate of most enzyme catalysed reactions changes with pH. As the pH increases, this rate

(A) reaches a minimum, then increases
(B) reaches a maximum, then decreases
(C) increases
(D) decreases

422. A substrate for the enzyme aldolase is

(A) galactose-6-phosphate
(B) isocitric acid
(C) Glucose-1-phosphate
(D) Fructose 1, 6 diphosphate

423. Decarboxylation of α-keto acids requires

(A) Thiamine pyrophosphate, FAD, NAD^+
(B) Flavin mononucleotide
(C) $NADP^+$
(D) NAD^+ only

424. Coenzyme A contains the vitamin:

(A) Riboflavin (B) Pantothenic acid
(C) Pyridoxine (D) Thiamine

425. Which of the following is not a component of coenzyme A?

(A) Adenylic acid
(B) Pantothenic acid
(C) β-mercaptoethylamine
(D) Deoxyadenylic acid

426. Malic enzyme convers malic acid, in the presence of $NADP^+$ to Pyruvic acid. This reaction is a/an

(A) Decarboxylation
(B) Decarboxylation and Dehydrogenation
(C) Dehydrogenation
(D) Oxidation

427. The following reaction is characteristic of what type of enzymes?

$2H_2O_2 \rightarrow {}_2H_2O + O_2$

(A) Peroxides
(B) Catalase
(C) Dehydrogenase
(D) Copper containing oxidases

428. Of Which warburg's yellow enzyme contains as a prosthetic group?

(A) Thiamine pyrophosphate
(B) Biotin
(C) NAD^+
(D) Riboflavin-5-phosphate

429. Dehydrogenases utilize, as coenzymes, all of the following except

(A) NAD^+ (B) $NADP^+$
(C) FAD (D) FH_4

430. Urea is produced physiologically by the action of the enzyme:

(A) Urease (B) Glutaminase
(C) Arginase (D) None of these

431. Urease is a

(A) Lyase (B) Ligase
(C) Isomerase (D) Hydrolase

432. Velocity maximum for an enzyme at half the substrate concentration gives

(A) The molecular weight of the enzyme
(B) Km value
(C) Isoelectric pH
(D) Pk value

433. Which of the following amino acid has been shown as one of the active site of phosphoglucomutase?

(A) Lysine (B) Tyrosine
(C) Serine (D) Histidine

434. The inhibition of succinate dehydrogenase by malonate by

(A) Competitive inhibition
(B) Non-competitive inhibition
(C) Uncompetitive inhibition
(D) Feedback inhibition

435. Cobamide coenzymes are

(A) Vitamin B_1 (B) Riboflavin
(C) Pyridoxine (D) Vitamin B_{12}

436. The isozyme CK-MB is specifically increased in the blood of patients who had

(A) Skeletal muscle disease
(B) Recent myocardial infarction
(C) Infective hepatitis
(D) Myxoedema

437. FAD containing enzyme, catalyzing formation of α, β unsaturated fatty acyl CoA derivative.

(A) Acyl CoA dehydrogenase
(B) Enoyl hydrase
(C) β-OH acyl CoA dehydrogenase
(D) Thiolase

438. Immobilized enzymes:

(A) Potentiation of activity
(B) Presentation of activity
(C) Preparation of activity
(D) All of these

439. This catalyzes formation of CoA derivatives from fatty acid, CoA and ATP:

(A) Acyl CoA dehydrogenase
(B) Enoyl hydrase
(C) β-OH acyl CoA dehydrogenase
(D) Thio kinase

440. Fructose 2, 3 bi phosphate is a powerful allosteric activator of

(A) Fructose 1, 6 diphosphatase
(B) Phosphofructokinase
(C) Hexokinase
(D) Fructokinase

441. 'Clearing factor' is

(A) Lipoprotein lipase
(B) Crotonase
(C) 7-dehydro cholesterol
(D) β-sitosterol

442. Maltase attacks only

(A) α-glucosides (B) β-glucosides
(C) Starch (D) Dextrins

443. Pepsin is

(A) Exo-peptidase (B) Endo-peptidase
(C) Carboxy peptidase (D) Amino peptidase

444. An enzyme in saliva which hydrolyzes starch is

(A) Pepsinogen (B) Chymotrysin
(C) α-Amylase (D) Malate

445. If a coenzyme is required in an enzyme reaction, the former usually has the function of

(A) Acting as an acceptor for one of the cleavage products of the substrate
(B) Enhancing the specificity of the apo enzyme
(C) Increasing the number of receptor sites of the apo enzyme
(D) Activating the substrate

446. The Michaehis-Menten hypothesis:

(A) Postulates the formation of an enzyme substrate complex
(B) Enables us to calculate the isoelectric point of an enzyme
(C) States that the rate of a chemical reaction may be independent of substrate concentration
(D) States that the reaction rate is proportional to substrate concentration

447. Schardinger's enzyme is

(A) Lactate dehydrogenase
(B) Xanthine dehydrogenase
(C) Uric oxidase
(D) L amino acid dehydrogenase

448. Tryptophan pyrolase is currently known as

(A) Tryptophan deaminase
(B) Tryptophan dioxygenase
(C) Tryptophan mono oxygenase
(D) Tryptophan decarboxylase

449. An enzyme which brings about lysis of bacterial cell wall is

(A) Amylase (B) Lysozyme
(C) Trypsin (D) Lipase

450. Trypsin has no action on

(A) Hemoglobin (B) Albumin
(C) Histone (D) DNA

451. Multiple forms of the same enzymes are known as

(A) Zymogens (B) Isoenzymes
(C) Proenzymes (D) Pre-enzymes

452. In non-competitive enzyme action

(A) V_{max} is increased
(B) Apparent k_m is increased
(C) Apparent k_m is decreased
(D) Concentration of active enzyme molecule is reduced

453. An allosteric enzyme influences the enzyme activity by

(A) Competiting for the catalytic site with the substrate
(B) Changing the specificity of the enzyme for the substrate
(C) Changing the conformation of the enzyme by binding to a site other than catalytic site
(D) Changing the nature of the products formed

454. Which of the following regulatory reactions involves a reversible covalent modification of an enzyme?

(A) Phosphorylation of serine OH on the enzyme
(B) Allosteric modulation
(C) Competitive inhibition
(D) Non-competitive inhibition

455. A competitive inhibitor of an enzyme has which of the following properties?

(A) It is frequently a feedback inhibitor
(B) It becomes covalently attached to an enzyme
(C) It decreases the V_{max}
(D) It interferes with substrate binding to the enzyme

456. When [s] is equal to K_m, which of the following conditions exist?

(A) Half the enzyme molecules are bound to substrate
(B) The velocity of the reaction is equal to Vmax
(C) The velocity of the reaction is independent of substrate concentration
(D) Enzyme is completely saturated with substrate

457. Which of the following statements about an enzyme exhibiting allosteric kinetics with cooperative interaction is false?

(A) A plot of V-V_k [s] has a sigmaidal shape
(B) An inhibitor may increase the apparent K_m
(C) Line weaver Bnrk plot is useful for determining K_m and V_{max}
(D) Removal of allosteric inhibitor may result in hyperbolic V-S [s] plot

458. Pantothenic acid acts on

(A) NADP (B) NADPH
(C) FAD (D) CoA

459. Vitamin deficiency that causes fatty liver includes all except

(A) Vitamin E (B) Pyridoxine
(C) Retionic acid (D) Pantothenic acid

460. In which of the following types of enzymes an inducer is not required?

(A) Inhibited enzyme (B) Cooperative enzyme
(C) Allosteric enzyme (D) Constitutive enzyme

461. In which of the following types of enzyme water may be added to a C—C double bond without breaking the bond?

(A) Hydrolase (B) Hydratase
(C) Hydroxylase (D) Esterase

462. 'Lock' and 'Key' model of enzyme action proposed by Fisher implies that

(A) The active site is flexible and adjusts to substrate
(B) The active site requires removal of PO_4 group
(C) The active site is complementary in shape to that of the substrate
(D) Substrates change conformation prior to active site interaction

463. In competitive inhibition of enzyme action

(A) The apparent K_m is decreased
(B) The apparent K_m is increased
(C) V_{max} is decreased
(D) Apparent concentration of enzyme molecules decreased

464. In competitive inhibition which of the following kinetic effect is true ?

(A) Decreases both K_m and V_{max}
(B) Increases both K_m and V_{max}
(C) Decreases K_m without affecting V_{max}
(D) Increases K_m without affecting V_{max}

465. Enzymes increase the rates of reactions by

(A) Increasing the free energy of activation
(B) Decreasing the energy of activation
(C) Changing the equilibrium constant of the reaction
(D) Increasing the free energy change of the reaction

466. The most useful test for the diagnosis of acute hemorrhagic pancreatitis during the first few days is

(A) Urinary lipase test (B) Serum calcium
(C) Urinary amylase (D) Serum amylase

467. The best test for acute pancreatitis in the presence of mumps is

(A) A serological test for mumps
(B) Serum amylase
(C) Urinary amylase
(D) Serum lipase

468. The slow moving fraction of LDH is typically increased in pancreas with

(A) Cerebrovascular accidents
(B) Acute myocardial infarction
(C) Acute pancreatitis
(D) Acute viral hepatits

469. Which of the following enzyme typically elevated in alcoholism?

(A) Serum ALP
(B) Serum GOT
(C) Serum γ-GT
(D) Serum acid phosphatase

470. Patients with hepatocellular jaundice, as compared to those with purely obstructive jaundice tend to have

(A) Lower serum ALP, LDH and AST activity
(B) Lower serum ALP, Higher LDH and AST activity
(C) Higher serum ALP, LDH and AST activity
(D) Higher serum ALP, Lower LDH and AST activity

471. If results of the serum bilirubin, serum ALP, LDH and AST determinations suggest obstructive jaundice, the best confirmatory test would be the estimation of

(A) Serum ALT
(B) Serum 5′ nucleotidase
(C) Serum Pseudo cholinesterase
(D) None of these

472. Which enzyme estimation will be helpful in differentiating the elevated serum ALP found in obstructive jaundice as well as bone disorders?

(A) Serum AST (B) Serum ALT
(C) Serum LDH (D) Serum γ-GT

473. Cardiac muscle contains which of the following CK osoenzyme?

(A) BB only (B) MM and BB only
(C) MM, BB and MB (D) MM and MB only

474. Liver and skeletol measle disorders are characterized by on disk proportionate increase in which of the LDH isoenzyme fraction?

(A) LDH-1 (B) LDH-1 and LDH-2
(C) LDH-3 and LDH-4 (D) LDH-2 and LDH-3
(E) LDH-5

475. On the third day following onset of acute myocardial infarction, which enzyme estimation will have the best predictive value?

(A) Serum AST (B) Serum CK
(C) Serum ALT (D) Serum LDH

476. Serum AST activity is not characteristically elevated as the result of

(A) Myocardial infarction
(B) Passive congestion of liver
(C) Muscular dystrophies
(D) Peptic ulcer

477. On which day following acute myocardial infarction the estimation of serum AST will be of greatest significance?

(A) First day (B) Second day
(C) Third day (D) Fourth day

478. In which diseases of the following organs, isoenzymes LDH-1 and LDH-2 will be released in plasma?

(A) Kidney, R.B.C and Liver
(B) Heart, Kidney and R.B.C
(C) Heart, Kidney and Liver
(D) Heart, Lungs and Brain

479. Plasma non-functional enzymes are

(A) totally absent
(B) low concentration in plastic
(C) important for diagnosis of several disease
(D) All of these

480. Pyruvate dehydrogenase contains all except

(A) Biotin (B) NAD
(C) FAD (D) CoA

481. An increase in LDH-5 enzyme is seen in the following except

(A) Acute hepatitis (B) Muscular distrophies
(C) Breast carcinoma (D) Pulmonary embolism

482. Diastase can be used for the hydrolysis can be used for the hydrolysis of

(A) Sucrose (B) Starch
(C) Cellulose (D) Maltose

483. Which of the following statements is true?

(A) Enzymes have names ending ase
(B) Enzymes are highly specific in their action
(C) Enzymes are living organisms
(D) Enzymes get activated on heating

484. Enzymes activity is controlled by

(A) pH of the solution
(B) Temperature
(C) Concentration of the enzyme
(D) Concentration of the substrate
(E) All of these

485. Which of the following is not true regarding enzymes?

(A) They catalyze only a particular type of reaction
(B) They remain active even after separation from the source
(C) They are destroyed after the completion of the reaction they catalyse
(D) They are irreversibly destroyed at high temperature
(E) Their activity depends on the pH of the solution

486 The number of enzymes known is about

(A) 10,000 (B) 100
(C) 50 (D) 26

487. Nicotine present in tobacco is a/an

(A) Alkaloid (B) Terpene
(C) Steroid (D) Protein

488. The poisonous alkaloid present in the oil of hemlock is

(A) Cocaine (B) Nicotine
(C) Quinine (D) Morphine

489. Alkaloids are usually purified by extraction with

(A) Ether (B) Dil HCl
(C) NaOH (D) Chloroform

490. The number of N-MC groups in alkaloids is best estimate with the help of

(A) HI (B) H_2SO_4
(C) $(CH_3CO)_2CO$ (D) CH_3 Mg I

491. A competitive inhibitor of an enzyme

(A) Increases K_m without affecting V_{max}
(B) Decreases K_m without affecting V_{max}
(C) Increases V_{max} without affecting K_m
(D) Decreases both V_{max} and Km

492. The Michaelis constant, K_m is

(A) Numerically equal to ½ V_{max}
(B) Dependent on the enzyme concentration
(C) Independent of pH
(D) Numerically equal to the substrate concentration that gives half maximal velocity

493. The rate of an enzyme catalyzed reaction was measured using several substrate concentrations that were much lower than K_m, the dependence of reaction velocity on substrate concentration can best be described as

(A) Independent of enzyme concentration
(B) A constant fraction of V_{max}
(C) Equal to K_m
(D) Proportional to the substrate concentration

494. The presence of a non competitive inhibitor

(A) Leads to both an increase in the V_{max} of a reaction and an increase in K_m
(B) Leads to a decrease in the observed Vmax
(C) Leads to a decrease in K_m and V_{max}
(D) Leads to an increase in K_m without affecting V_{max}

495. Which one of the following statements is not characteristic of allosteric enzymes?

(A) They frequently catalyze a committed step early in a metabolic pathway
(B) They are often composed of subunits
(C) They follow Michaelis-Menten kinetics
(D) They frequently show cooperativity for substrate binding

496. The abnormal isoenzyme need not

(A) Be an oxidoreductase
(B) Have any coenzyme
(C) Require ATP
(D) Be localized intracellularly
(E) Be a catalyst

497. LDH assays are most useful in diagnosing diseases of the

(A) Heart (B) Pancreas
(C) Brain (D) Kidney

498. The chemical forces that bind most coenzymes and substrates to enzymes such as LDH are

(A) Hydrogen bonds (B) Peptide bonds
(C) Coordinate bonds (D) Covalent bonds

499. How many different proteins may be present in normal LDH?

(A) One (B) Two
(C) Three (D) Four

500. All the isoenzymes function with the coenzyme:

(A) $NADP^+$ (B) FAD
(C) Lipoate (D) NAD^+

501. 'Lock' and 'Key' theory was proposed by

(A) Sorenson (B) Fischer
(C) Mehler (D) Sanger

502. Which of the following forms part of a coenzyme?

(A) Zn^{2+} (B) Lipase
(C) Vitamin B_2 (D) Lysine

503. The shape of an enzyme and consequently its activity can be reversibly altered from moment to moment by

(A) Heat (B) Amino acid substrate
(C) Allosteric subunits (D) Sulfur substitutions

504. Which one of the following regulatory actions involves a reversible covalent modification of the enzyme?

(A) Phosphorylation of ser-OH on the enzyme
(B) Allosteric modulation
(C) Competitive inhibition
(D) Non-competitive inhibition

505. An enzyme is a

(A) Carbohydrate (B) Lipid
(C) Protein (D) Nucleic acid

506. An enzyme promotes a chemical reaction by

(A) Lowering the energy of activation
(B) Causing the release of heat which acts as a primer
(C) Increasing molecular motion
(D) Changing the free energy difference between substrate and product

507. In most metabolic pathways, all needed enzymes are arranged together in a multienzyme complex within a

(A) Solution of ATP
(B) Membrane
(C) Quanternary protein
(D) Coenzyme

508. An enzyme catalyzes the conversion of an aldose sugar to a ketose sugar would be classified as one of the

(A) Transferases (B) Isomerases
(C) Oxido reductases (D) Hydrolases

509. The function of an enzyme is to

(A) Cause chemical reactions that would not otherwise take place
(B) Change the rates of chemical reactions
(C) Control the equilibrium points of reactions
(D) Change the directions of reactions

510. In which of the following types of enzymes, water may be added to a C—C double bond without breaking the bond?

(A) Hydrolase (B) Hydratase
(C) Hydroxylase (D) Oxygenase

511. Enzymes increases the rate of reactions by

(A) Increasing the free energy of activation
(B) Decreasing the energy of activation
(C) Changing the equilibrium constant of the reaction
(D) Increasing the free energy change of the reaction

512. The active site of an enzyme is formed by a few of the enzymes:

(A) R groups of the amino acids
(B) Amino groups of the amino acids
(C) Carboxyl group of the amino acids
(D) Exposed sulfur bonds

513. Allosteric enzymes contain

(A) Multiple subunits (B) Single chain
(C) Two chains (D) Three chains

514. Isoenzymes of lactate dehydrogenase are useful for the diagnosis of

(A) Heart disease (B) Kidney disease
(C) Liver disease (D) Both (A) and (C)

515. IUB had divided enzymes into how many classes?

(A) 6 (B) 5
(C) 8 (D) 4

516. The first enzyme isolated, purified and crystallied from Jack bean (Canavalia) by summer in 1926 was

(A) Urease (B) Insulin
(C) Ribonuclease (D) Zymase

517. Who suggested that enzymes are proteinaceous?

(A) Buchner (B) Kuhne
(C) Sumner (D) Pasteur

518. Feedback inhibition of enzyme action is affected by

(A) Enzyme (B) Substrate
(C) End products (D) None of these

519. The enzyme that converts glucose to glucose-6-phosphate is

(A) Phosphatase (B) Hexokinase
(C) Phosphorylase (D) Glucose synthetase

520. Enzymes are required in traces because they

(A) Have high turnover number
(B) Remain unused at the end of reaction and are re used
(C) Show cascade effect
(D) All correct

521. An organic substance bound to an enzyme and essential for the activity of enzyme is called

(A) Holoenzyme (B) Apoenzyme
(C) Coenzyme (D) Isoenzyme

522. Enzyme catalysed reactions occur in

(A) Pico seconds (B) Micro seconds
(C) Milli seconds (D) None of these

523. An enzyme can accelerate a reaction up to

(A) 10^{10} times (B) 10^{1} times
(C) 10^{100} times (D) 10 times

524. In plants, enzymes occur in

(A) Flowers only (B) Leaves only
(C) All living cells (D) Storage organs only

525. Zymogen is a

(A) Vitamin (B) Enzyme precursor
(C) Modulator (D) Hormone

526. Cofactor (Prosthetic group) is a part of holoenzyme, it is

(A) Inorganic part loosely attached
(B) Accessory non-protein substance attached firmly
(C) Organic part attached loosely
(D) None of these

527. A protein having both structural and enzymatic traits is

(A) Myosin (B) Collagen
(C) Trypsin (D) Actin

528. Enzymes are different from catalysts in

(A) Being proteinaceous
(B) Not used up in reaction
(C) Functional at high temperature
(D) Having high rate of diffusion

529. Enzymes, vitamins and hormones are common in

(A) Being proteinaceous
(B) Being synthesized in the body of organisms
(C) Enhancing oxidative metabolism
(D) Regulating metabolism

530. Dry seeds endure higher temperature than germinating seeds as

(A) Hydration is essential for making enzymes sensitive to temperature
(B) Dry seeds have a hard covering
(C) Dry seeds have more reserve food
(D) Seedlings are tender

531. Coenzymes FMN and FAD are derived from vitamin

(A) C (B) B_6
(C) B_1 (D) B_2

532. Template/lock and key theory of enzyme action is supported by

(A) Enzymes speed up reaction
(B) Enzymes occur in living beings and speed up certain reactions
(C) Enzymes determine the direction of reaction
(D) Compounds similar to substrate inhibit enzyme activity

533. Combination of apoenzyme and coenzyme produces

(A) Prosthetic group
(B) Holoenzyme
(C) Enzyme substrate complex
(D) Enzyme product complex

534. Enzyme inhibition caused by a substance resembling substrate molecule is

(A) Competitive inhibition
(B) Non-competitive inhibition
(C) Feedback inhibition
(D) Allosteric inhibition

535. An enzyme brings about

(A) Decrease in reaction time
(B) Increase in reaction time
(C) Increase in activation energy
(D) Reduction in activation energy

536. Feedback inhibition of enzyme is influenced by

(A) Enzyme (B) External factors
(C) End product (D) Substrate

537. Coenzyme is

(A) Often a vitamin compound (B) Always an inorganic
(C) Always a protein (D) Often a metal

538. Genetic engineering requires enzyme:

(A) DNA ase
(B) Amylase
(C) Lipase
(D) Restriction endonuclease

539. Which is not true about inorganic catalysts and enzymes?

(A) They are specific
(B) Inorganic catalysts require specific not needed by enzymes
(C) They are sensitive to pH
(D) They speed up the rate of chemical reaction

540. Key and lock hypothesis of enzyme action was given by

(A) Fischer (B) Koshland
(C) Buchner (D) Kuhne

541. An example of feedback inhibition is

(A) Allosteric inhibition of hexokinase by glucose-6-phosphate
(B) Cyanide action on cytochrome
(C) Sulpha drug on folic acid synthesizer bacteria
(D) Reaction between succinic dehydrogenase and succinic acid

542. Feedback term refers to

(A) Effect of substrate on rate of enzymatic reaction
(B) Effect of end product on rate reaction
(C) Effect of enzyme concentration on rate of reaction
(D) Effect of external compound on rate of reaction

543. Allosteric inhibition

(A) Makes active site unifit for substrate
(B) Controls excess formation and end product
(C) Both (A) and (B)
(D) None of these

544. The ratio of enzyme to substrate molecules can be as low as

(A) 1 : 100,000 (B) 1 : 500,000
(C) 1 : 10,000 (D) 1 : 1,000

545. Vitamin B_2 is component of coenzyme:

(A) Pyridoxal phosphate
(B) TPP
(C) NAD
(D) FMN/FAD

546. K_m value of enzyme is substrate concentration at

(A) ½ V_{max} (B) 2 V_{max}
(C) ½ V_{max} (D) 4 V_{max}

547. Part of enzyme which combines with non-protein part to form functional enzyme is

(A) Apoenzyme (B) Coenzyme
(C) Prosthetic group (D) None of these

548. Who got Nobel Prize in 1978 for working on enzymes?

(A) Koshland (B) Arber and Nathans
(C) Nass and Nass (D) H.G. Khorana

549. Site of enzyme synthesis in a cell is

(A) Ribosomes (B) RER
(C) Golgi bodies (D) All of these

550. The fruit when kept is open, tastes bitter after 2 hours because of

(A) Loss of water from juice
(B) Decreased concentration of fructose in juice
(C) Fermentation by yeast
(D) Contamination by bacterial enzymes

551. Hexokinase (Glucose + ATP → Glucose-6–P + ADP) belongs to the category:

(A) Transferases (B) Lysases
(C) Oxidoreductases (D) Isomerases

552. Which enzyme is concerned with transfer of electrons?

(A) Desmolase (B) Hydrolase
(C) Dehydrogenase (D) Transaminase

553. The best example of extracellular enzymes (exoenzyme) is

(A) Nucleases
(B) Digestive enzymes
(C) Succinic dehydrogenase
(D) None of these

554. Which mineral element controls the activity of Nitrate reductase ?

(A) Fe (B) Mo
(C) Zn (D) Ca

555. Name the enzyme that acts both as carboxylase at one time and oxygenase at another time.

(A) PEP carboxylase
(B) RuBP carboxylase
(C) Carbonic anyhdrase
(D) None of these

556. A metabolic pathways is a

(A) Route taken by chemicals
(B) Sequence of enzyme facilitated chemical reactions
(C) Route taken by an enzyme from one reaction to another
(D) Sequence of origin of organic molecules

557. The energy required to start an enzymatic reaction is called

(A) Chemical energy (B) Metabolic energy
(C) Activation energy (D) Potential energy

558. Out of the total enzymes present in a cell, a mitochondrion alone has

(A) 4% (B) 70%
(C) 95% (D) 50%

559. Creatine phosphokinase isoenzyme is a marker for

(A) Kidney disease
(B) Liver disease
(C) Myocardial infarction
(D) None of these

560. Which inactivates an enzyme by occupying its active site?

(A) Competitive inhibitor
(B) Allosteric inhibitor
(C) Non-competitive inhibitor
(D) All of these

561. Which one is coenzyme?

(A) ATP (B) Vitamin B and C
(C) CoQ and CoA (D) All of these

562. The active site of an enzyme is formed by

(A) R group of amino acids
(B) NH_2 group of amino acids
(C) CO group of amino acids
(D) Sulphur bonds which are exposed

563. Carbonic anhydrase enzyme has maximum turn over number (36 million). Minimum turn over number for an enzyme:

(A) DNA polymerase
(B) Lysozyme
(C) Penicillase
(D) Lactase dehydrogenase

564. In cell, digestive enzymes are found mainly in

(A) Vacuoles (B) Lysosomes
(C) Ribosomes (D) Lomasomes

565. Substrate concentration at which an enzyme attains half its maximum velocity is

(A) Threshold value
(B) Michaelis-Menton constant
(C) Concentration level
(D) None of these

566. Which enzyme hydrolyses starch?

(A) Invertase (B) Maltase
(C) Sucrase (D) Diastase

567. Enzymes functional in cell or mitochondria are

(A) Endoenzymes (B) Exoenzymes
(C) Apoenzymes (D) Holoenzymes

568. The enzymes present in the membrane of mitochondria are

(A) Flavoproteins and cytochromes
(B) Fumarase and lipase
(C) Enolase and catalase
(D) Hexokinase and zymase

569. A mitochondrial marker enzyme is

(A) Aldolase
(B) Amylase
(C) Succinic dehydrogenase
(D) Pyruvate dehydrogenase

570. The enzyme used in polymerase chain reaction (PCR) is

(A) Taq polymerase (B) RNA polymerase
(C) Ribonuclease (D) Endonuclease

571. Which of the following is a microsomal enzyme inducer?

(A) Indomethacin (B) Clofibrate
(C) Tolbutamide (D) Glutethamide

572. Identify the correct molecule which controls the biosynthesis of proteins in living organisms.

(A) DNA (B) RNA
(C) Purines (D) Pyrimidines

573. The tear secretion contains an antibacterial enzyme known as

(A) Zymase (B) Diastase
(C) Lysozyme (D) Lipase

574. Identify one of the canbonic anhydrase inhibitor that inhibit only luminal carbonic anhydrase enzyme.

(A) Methazolamide (B) Acetazolamide
(C) Dichlorphenamide (D) Benzolamide

575. Group transferring Co-enzyme is

(A) CoA (B) NAD^+
(C) $NADP^+$ (D) FAD^+

576. The co-enzyme containing an automatic hetero ring in the structure is

(A) Biotin (B) TPP
(C) Sugar Phosphate (D) Co-enzyme

577. The example of hydrogen transferring Co-enzyme is:

(A) B_6-PO_4 (B) $NADP^+$
(C) TPP (D) ATP

578. Enzyme catalyzed hydrolysis of proteins produces amino acid of the form

(A) D (B) DL
(C) L (D) Racemic

579. Transaminase activity needs the Co-enzyme:

(A) ATP (B) B_6-PO_4
(C) FADT (D) NAD^+

580. The biosynthesis of urea occurs mainly in the liver:

(A) Cytosol (B) Mitochondria
(C) Microsomes (D) Nuclei

581. Bile salts make emulsification with fat for the action of

(A) Amylose (B) Lipase
(C) Pepsin (D) Trypsin

582. All of the following compounds are intermediates of TCA cycle except

(A) Maleate (B) Pyruvate
(C) Oxaloacetate (D) Fumarate

583. In conversion of lactic acid to glucose, three reactions of glycolytic pathway are circumvented, which of the following enzymes do not participate?

(A) Pyruvate carboxylase
(B) Phosphoenol pyruvate carboxy kinase
(C) Pyruvate kinase
(D) Glucose-6-phosphatase

584. In the normal resting state of human most of the blood glucose burnt as fuel is consumed by

(A) Liver (B) Brain
(C) Adipose tissue (D) Muscles

585. A regulator of the enzyme glucogen synthase is

(A) Citric Acid (B) Pyruvate
(C) Glucose-6-PO_4 (D) GTP

586. A specific inhibitor for succinate dehydrogenase is

(A) Arsenite (B) Malonate
(C) Citrate (D) Fluoride

ANSWERS

1. A	2. B	3. A	4. D	5. C	6. D
7. C	8. A	9. B	10. D	11. C	12. D
13. A	14. B	15. D	16. A	17. B	18. C
19. B	20. D	21. A	22. A	23. B	24. B
25. D	26. B	27. A	28. A	29. A	30. B
31. C	32. A	33. B	34. C	35. A	36. B
37. A	38. B	39. D	40. C	41. D	42. A
43. A	44. B	45. C	46. A	47. D	48. B
49. C	50. B	51. B	52. A	53. A	54. C
55. C	56. D	57. C	58. C	59. A	60. B
61. A	62. C	63. A	64. D	65. A	66. D
67. A	68. C	69. B	70. B	71. A	72. B
73. A	74. B	75. A	76. B	77. C	78. C
79. A	80. A	81. C	82. C	83. B	84. D
85. B	86. B	87. D	88. D	89. D	90. A
91. A	92. A	93. A	94. B	95. A	96. B
97. A	98. A	99. A	100. A	101. A	102. B
103. A	104. C	105. A	106. D	107. B	108. A
109. D	110. C	111. B	112. B	113. D	114. A
115. B	116. A	117. B	118. C	119. B	120. C
121. A	122. C	123. C	124. D	125. A	126. A
127. B	128. B	129. B	130. B	131. C	132. A
133. D	134. A	135. B	136. B	137. A	138. B
139. B	140. C	141. D	142. B	143. A	144. B
145. B	146. A	147. A	148. C	149. A	150. A
151. B	152. B	153. D	154. A	155. A	156. D
157. A	158. A	159. A	160. A	161. A	162. A
163. B	164. A	165. A	166. B	167. B	168. C
169. A	170. D	171. D	172. A	173. C	174. B
175. B	176. A	177. C	178.A	179. D	180. B
181. D	182. B	183. D	184. C	185. C	186. A
187. D	188. C	189. A	190. A	191. C	192. C
193. A	194. C	195. A	196. A	197. B	198. B
199. B	200. A	201. D	202. C	203. D	204. D
205. B	206. A	207. D	208. A	209. A	210. D
211. A	212. A	213. D	214. D	215. A	216. A
217. A	218. A	219. D	220. D	221. C	222. C
223. B	224. D	225. A	226. A	227. B	228. B
229. D	230. A	231. B	232. D	233. A	234. A
235. D	236. B	237. A	238. C	239. B	240. C
241. B	242. A	243. B	244. A	245. A	246. A
247. A	248. A	249. A	250. C	251. B	252. C

253. B	254. D	255. C	256. D	257. A	258. B
259. D	260. C	261. B	262. C	263. A	264. D
265. A	266. B	267. C	268. A	269. B	270. C
271. C	272. A	273. D	274. A	275. B	276. C
277. B	278. C	279. B	280. D	281. C	282. B
283. B	284. D	285. C	286. D	287. C	288. A
289. C	290. D	291. C	292. B	293. C	294. D
295. D	296. B	297. D	298. C	299. B	300. B
301. B	302. D	303. D	304. A	305. B	306. D
307. C	308. B	309. C	310. D	311. A	312. C
313. D	314. B	315. B	316. C	317. C	318. B
319. B	320. A	321. D	322. A	323. A	324. B
325. C	326. C	327. A	328. D	329. B	330. A
331. C	332. C	333. C	334. C	335. D	336. A
337. A	338. D	339. C	340. D	341. C	342. C
343. C	344. A	345. D	346. C	347. C	348. C
349. C	350. C	351. C	352. C	353. C	354. B
355. C	356. A	357. C	358. A	359. D	360. D
361. D	362. B	363. A	364. D	365. C	366. A
367. D	368. A	369. D	370. D	371. C	372. B
373. C	374. A	375. C	376. A	377. B	378. B
379. C	380. B	381. C	382. B	383. B	384. D
385. B	386. C	387. D	388. C	389. D	390. C
391. D	392. C	393. C	394. A	395. D	396. D
397. C	398. C	399. B	400. C	401. D	402. B
403. C	404. B	405. D	406. D	407. A	408. C
409. C	410. D	411. B	412. B	413. B	414. D
415. A	416. C	417. D	418. D	419. C	420. C
421. B	422. D	423. A	424. B	425. D	426. B
427. B	428. D	429. D	430. C	431. D	432. B
433. C	434. A	435. D	436. B	437. A	438. B
439. D	440. B	441. A	442.A	443. B	444. C
445. A	446. A	447. B	448. B	449. B	450. D
451. B	452. C	453. C	454. A	455. D	456. A
457. D	458. B	459. C	460. D	461. B	462. C
463. B	464. D	465. B	466. D	467. D	468. D
469. C	470. B	471. B	472. D	473. D	474. C
475. D	476. D	477. B	478. B	479. D	480. A
481. D	482. B	483. B	484. C	485. C	486. C
487. A	488. A	489. B	490. A	491. A	492. D
493. C	494. B	495. C	496. A	497. A	498. D
499. D	500. D	501. D	502. C	503. C	504. A
505. C	506. A	507. B	508. B	509. B	510. A

511. B	512. C	513. A	514. D	515. A	516. A
517. C	518. C	519. B	520. D	521. C	522. C
523. A	524. C	525. B	526. B	527. A	528. A
529. D	530. A	531. D	532. D	533. B	534. A
535. D	536. C	537. A	538. D	539. B	540. A
541. A	542. B	543. C	544. A	545. D	546. D
547. C	548. A	549. B	550. D	551. C	552. A
553. C	554. A	555. B	556. B	557. C	558. B
559. C	560. A	561. D	562. A	563. B	564. B
565. B	566. D	567. A	568. A	569. C	570. D
571. D	572. A	573. C	574. B	575. A	576. C
577. D	578. C	579. B	580. B	581. B	582. B
583. B	584. B	585. C	586. B		

EXPLANATIONS FOR THE ANSWERS

4. D The functional unit of an enzyme is referred to as a holoenzyme. It is often made up of an apoenzyme (the protein part) and a coenzyme (the non-protein part).

47. D Concentration of enzyme, concentration of substrate, temperature, pH, presence of products, activators and inhibitors are some of the important factors that influence enzyme activity.

89. D It is a straight line graphic representation depicting the relation between substrate concentration and enzyme velocity. This plot is commonly employed for the calculation of Km values for enzymes.

133. D Active site is the small region of an enzyme where substrate binds. It is flexible in nature and it exists due to the tertiary structure of proteins. Acidic, basic and hydroxyl amino aicds are frequently found at the active site.

179. D There are three broad categories of enzyme inhibition:

(a) ***Reversible inhibition:*** The inhibitor binds non-covalently with the enzyme and the inhibition is reversible. Competitive, non-competitive and uncompetitive come under this category.

(b) ***Irreversible inhibition:*** The inhibitor covalently binds with the enzyme which is irreversible.

(c) ***Allosteric inhibition:*** Certain enzymes possessing allosteric sites are regulated by allosteric effectors.

219. D Enzymes are highly specific in their action compared with chemical catalysts. Three types of enzyme specificities are well-recognized.

(a) ***Stereospecificity:*** The enzymes act only on one isomer and therefore exhibit stereoisomerism. e.g., L-amino acid oxidase on L-amino acids; hexokinase on D-hexose (Note: isomerases do not exhibit stereospecificity).

(b) ***Reaction specificity:*** The same substrate can undergo different types of reactions, each catalysed by a separate enzyme e.g., amino acids undergoing transamination, decarboxylation etc.

(c) ***Substrate specifity:*** This may be absolute, relative or broad e.g., urease, ligase, hexokinase.

260. D

(a) ***Lock and Key model*** (Fischer's Template theory): The substrate fits to active site of an enzyme just as a key fits into a proper lock. Thus, the active site of the enzyme is rigid and preshaped where only a specific substrate can bind.

(b) ***Induced fit theory*** (Koshland model): As per this, the substrate induces a conformational change in the enzyme resulting in the formation of substrate binding (active) site.

305. C Some enzymes are synthesized in an inactive form which are referred to as proenzymes (or zymogens). They undergo irreversible modification to produce active enzymes. *e.g.,* proenzymes – chymotrypsinogen and pepsinogen are respectively converted to chymotrypsin and pepsin.

345. D The RNAs that can function as enzymes are referred to as ribozymes. They are thus non-protein enzymes. It is believed that RNAs were functioning as catalysts before the occurance of proteins during evolution.

391. D ***Streptokinase*** is used for clearing blood clots.
Asparaginase is employed in the treatment of leukemias.

438. B Certain enzymes can be made to bind to insoluble inorganic matrix (*e.g.,* cyanogens bromide activated sepharose) to preserve their catalytic activity for long periods. Such enzymes are referred to as immobilized enzymes.

479. D These enzymes are either totally absent or present at a low concentration in plasma compared to their levels found in tissues. Estimation of plasma non-functional enzymes is important for the diagnosis and prognosis of several diseases.

514. D Lactate dehydrogenase (LDH) gas five distinct isoenzymes (LDH_1 ... LDH_5). Each one is an oligomeric protein composed of 4 subunits (N and/ or H). Isoenzymes of LDH are important for the diagnosis of heart and liver related disorders i.e., serum LDH_1 is elevated in myocardial infarction while LDH_5 is increased in liver diseases.

559. C Creatine kinase (CK) or creatine phosphokinase (CPK) exists as 3 isoenzymes. Each isoenzyme is a dimmer composed of two subunits (M or B or both). Elevation of CPK2 (MB) in serum is an early reliable diagnostic indication of myocardial infarction.

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CHAPTER 7

MINERAL METABOLISM

1. When ATP forms AMP

(A) Inorganic pyrophosphate is produced
(B) Inorganic phosphorous is produced
(C) Phsophagen is produced
(D) No energy is produced

2. Standard free energy (ΔG°) of hydrolysis of ATP to ADP + Pi is

(A) –49.3 KJ/mol (B) –4.93 KJ/mol
(C) –30.5 KJ/mol (D) –20.9 KJ/mol

3. Standard free energy (ΔG°) of hydrolysis of ADP to AMP + Pi is

(A) –43.3 KJ/mol (B) –30.5 KJ/mol
(C) –27.6 KJ/mol (D) –15.9 KJ/mol

4. Standard free energy (ΔG°) of hydrolysis of phosphoenolpyruvate is

(A) –61.9 KJ/mol (B) –43.1 KJ/mol
(C) –14.2 KJ/mol (D) –9.2 KJ/mol

5. Standard free energy (ΔG°) of hydrolysis of creatine phosphate is

(A) –51.4 KJ/mol (B) –43.1 KJ/mol
(C) –30.5 KJ/mol (D) –15.9 KJ/mol

6. The oxidation-reduction system having the highest redox potential is

(A) Ubiquinone ox/red
(B) Fe^{3+} cytochrome a/Fe^{2+}
(C) Fe^{3+} cytochrome b/Fe^{2+}
(D) NAD^+/NADH

7. If ΔG°= –2.3RT log Keq, the free energy for the reaction will be

A + B ⇌ C
10moles 10moles 10moles

(A) –4.6 RT (B) –2.3 RT
(C) +2.3 RT (D) +4.6 RT

8. Redox potential (E_o volts) of NAD^+/NADH is

(A) –0.67 (B) –0.32
(C) –0.12 (D) +0.03

9. Redox potential (E_o volts) of ubiquinone, ox/red system is

(A) +0.03 (B) +0.08
(C) +0.10 (D) +0.29

10. Redox potential (E_o volts) of cytochrome C, Fe^{3+}/Fe^{2+} is

(A) –0.29 (B) –0.27
(C) –0.08 (D) +0.22

11. The prosthetic group of aerobic dehydrogenases is

(A) NAD (B) NADP
(C) FAD (D) Pantothenic acid

12. Alcohol dehydrogenase from liver contains

(A) Sodium (B) Copper
(C) Zinc (D) Magnesium

13. A molybdenum containing oxidase is

(A) Cytochrome oxidase
(B) Xanthine oxidase
(C) Glucose oxidase
(D) L-Amino acid oxidase

14. A copper containing oxidase is

(A) Cytochrome oxidase
(B) Flavin mononucleotide
(C) Flavin adenine dinucleotide
(D) Xanthine oxidase

15. The mitochondrial superoxide dismutase contains

(A) Mg^{++} (B) Mn^{++}
(C) Co^{++} (D) Zn^{++}

16. Cytosolic superoxide dismutase contains

(A) Cu^{2+} and Zn^{2+} (B) Mn^{2+}
(C) Mn^{2+} and Zn^{2+} (D) Cu^{2+} and Fe^{2+}

17. Cytochrome oxidase contains

(A) Cu^{2+} and Zn^{2+} (B) Cu^{2+} and Fe^{2+}
(C) Cu^{2+} and Mn^{2+} (D) Cu^{2+}

18. Characteristic absorption bands exhibited by ferrocytochrome:

(A) α band (B) β band
(C) α and β bands (D) α, β and γ bands

19. Monooxygenases are found in

(A) Cytosol (B) Nucleus
(C) Mitochondira (D) Microsomes

20. A component of the respiratory chain in mitochondria is

(A) Coenzyme Q
(B) Coenzyme A
(C) Acetyl coenzyme
(D) Coenzyme containing thiamin

21. The redox carriers are grouped into respiratory chain complex

(A) In the inner mitochondrial membrane
(B) In mitochondiral matrix
(C) On the outer mitochondrial membrane
(D) On the inner surface of outer mitochondrial membrane

22. The sequence of the redox carrier in respiratory chain is

(A) NAD—FMN—Q—cyt b—cyt c_1—cyt c—cyt $aa_3 \longrightarrow O_2$
(B) FMN—Q—NAD—cyt b—cyt aa_3—cyt c_1—cyt c $\longrightarrow O_2$
(C) NAD—FMN—Q—cyt c_1—cyt c—cyt b—cyt $aa_3 \longrightarrow O_2$
(D) NAD—FMN—Q—cyt b—cyt aa_3—cyt c—cyt $c_1 \longrightarrow O_2$

23. The correct sequence of cytochrome carriers in respiratory chain is

(A) Cyt b—cyt c—cyt c_1—cyt aa_3
(B) Cyt aa_3— cyt b—cyt c—cyt c_1
(C) Cyt b—cyt c_1—cyt c—cyt aa_3
(D) Cyt b—cyt aa_3—cyt c_1— cyt c

24. Reducing equivalents from pyruvate enter the mitochondrial respiratory chain at

(A) FMN (B) NAD
(C) Coenzyme Q (D) Cyt b

25. Reducing equivalents from succinate enter the mitochondrial respiratory chain at

(A) NAD (B) Coenzyme Q
(C) FAD (D) Cyt c

26. The respiratory chain complexes acting as proton pump are

(A) I, II and III (B) I, II and IV
(C) I, III and IV (D) I and II

27. If the reducing equivalents enter from FAD in the respiratory chain, the phosphate.oxygen ration (P:O) is

(A) 2 (B) 1
(C) 3 (D) 4

28. If the reducing equivalents enter from NAD in the respiratory chain, the phsphate/oxygen (P:O) is

(A) 1 (B) 2
(C) 3 (D) 4

29. One of the site of phsosphorylation in mitochondrial respiratory chain is

(A) Between FMN and coenzyme Q
(B) Between coenzyme Q and cyt b
(C) Between cytochrome b and cytochrome c_1
(D) Between cytochrome c_1 and cytochrome c

30. Rotenone inhibits the respiratory chain at

(A) FMN $\rightarrow$ coenzyme Q
(B) NAD $\rightarrow$ FMN
(C) Coenzyme Q $\rightarrow$ cyt b
(D) Cyt b $\rightarrow$ Cyt c_1

31. Activity of cytochrome oxidase is inhibited by

(A) Sulphite (B) Sulphate
(C) Arsenite (D) Cyanide

32. Transfer of reducing equivalents from succinate dehydrogenase to coenzyme Q is specifically inhibited by

(A) Carboxin (B) Oligomycin
(C) Piericidin A (D) Rotenone

33. Chemiosmotic theory for oxidative phosphorylation has been proposed by

(A) Chance and Williams
(B) Pauling and Corey
(C) S. Waugh
(D) P. Mitchell

34. The number of ATP produced in the oxidation of 1 molecule of NADPH in oxidative phosphorylation is

(A) Zero (B) 2
(C) 3 (D) 4

35. The coupling of oxidation and phosphorylation in intact mitochondria:

(A) Puromycin (B) Oligomycin
(C) Streptomycin (D) Gentamycin

36. An uncoupler of oxidative phosphorylation is

(A) Carboxin (B) Atractyloside
(C) Amobarbital (D) Dinitrocresol

37. The chemical inhibiting oxidative phosphorylation, Adependent on the transport of adenine nucleotides across the inner mitochondrial membrane is

(A) Oligomycin (B) Atractyloside
(C) Dinitrophenol (D) Pentachlorophenol

38. Porphyrins are synthesized in

(A) Cytosol
(B) Mitochondria
(C) Cytosol and mitochondria
(D) Rough endoplasmic reticulum

39. Heme is synthesized from

(A) Succinyl-CoA and glycine
(B) Active acetate and glycine
(C) Active succinate and alanine
(D) Active acetate and alanine

40. In the biosynthesis of the iron protoporphyrin, the product of the condensation between succinyl-CoA and glycine is

(A) α-Amino β-ketoadipic acid
(B) δ-Aminolevulinate
(C) Hydroxymethylbilane
(D) Uroporphyrinogen I

41. Porphyrin synthesis is inhibited in

(A) Mercury poisoning
(B) Lead poisoning
(C) Manganese poisoning
(D) Barium poisoning

42. During synthesis of porphyrins, synthesis of δ-amino levulinic acid occurs in

(A) Mitochondria
(B) Cytosol
(C) Both in mitochondria and cytosol
(D) Ribosomes

43. In the biosynthesis of heme, condensation between succinyl CoA and glycine requires

(A) NAD^+ (B) FAD
(C) $NADH + H^+$ (D) B_6-phosphate

44. In mammalian liver the rate controlling enzyme in porphyrin biosynthesis is

(A) ALA synthase
(B) ALA hydratase
(C) Uroporphyrinogen I synthase
(D) Uroporphyrinogen III cosynthase

45. The condensation of 2 molecules of δ-aminolevulinate dehydratase contains

(A) ALA synthase
(B) ALA hydratase
(C) Uroporphyrinogen synthase I
(D) Uroporphyrinogen synthase III

46. The enzyme δ-aminolevulinate dehydratase contains

(A) Zinc (B) Manganese
(C) Magnesium (D) Calcium

47. A cofactor required for the activity of the enzyme ALA dehydratase is

(A) Cu (B) Mn
(C) Mg (D) Fe

48. The number of molecules of porphobilinogen required for the formation of a tetrapyrrole i.e., a porphyrin is

(A) 1 (B) 2
(C) 3 (D) 4

49. Conversion of the linear tetrapyrrole hydroxymethylbilane to uroporphyrinogen III

(A) Occurs spontaneously
(B) Catalysed by uroporphyrinogen I synthase
(C) Catalysed by uroporphyrinogen III cosynthase
(D) Catalysed by combined action of uroporphyrinogen I synthase and uroporphyrinogen III cosynthase

50. Conversion of uroporphyrinogen III to coprophyrinogen III is catalysed by the enzyme.:

(A) Uroporphyrinogen decarboxylase
(B) Coproporphyrinogen oxidase
(C) Protoporphyrinogen oxidase
(D) Ferrochelatase

51. The synthesis of heme from protophyrin III is catalysed by the enzyme:

(A) ALA synthase (B) Ferroreductase
(C) Ferrooxidase (D) Ferrochelatase

52. Many xenobiotics

(A) Increase hepatic ALA synthase
(B) Decrease hepatic ALA sythase
(C) Increase hepatic ALA dehydrase
(D) Decrease hepatic ALA dehydrase

53. Acute intermittent porphyria (paraoxymal porphyria) is caused due to deficiency of

(A) Uroporphyrinogen I synthase
(B) ALA synthase
(C) Coproporphyrinogen oxidase
(D) Uroporphyrinogen decarboxylase

54. The major symptom of acute intermittent porphyria includes

(A) Abdominal pain
(B) Photosensitivity
(C) No neuropsychiatric signs
(D) Dermatitis

55. The characteristic urinary finding in acute intermittent porphyria is

(A) Increased quantity of uroporphyrin
(B) Increased quantity of coproporphyrin I
(C) Increased quantity of coproporphyrin III
(D) Massive quantities of porphobilinogen

56. The enzyme involved in congenial erythropoietic porphyria is

(A) Uroporphyrinogen I synthase
(B) Uroporphyrinogen III cosynthase
(C) Protoporphyrinogen oxidase
(D) Ferrochelatase

57. Main symptoms of congenital erythropoietic porphyria is

(A) Yellowish teeth (B) Photosensitivity
(C) Abdominal pain (D) Brownish urine

58. The probable cause of porphyria cutanea tarda is deficiency of

(A) Uroporphyrinogen oxidase
(B) Coproporphyrinogen oxidase
(C) Protoporphyrinogen oxidase
(D) Uroporphyrinogen I synthase

59. The characteristic urinary finding in porphyria cutanea tarda is

(A) Increased quantity of porphobilinogen
(B) Increased quantity of red cell protoporphyrin
(C) Increased quantity of uroporphyrin
(D) Increased quantity of δ-ALA

60. Hereditary coproporphyria is caused due to deficiency of

(A) Protoporphyrinogen oxidase
(B) ALA synthase
(C) ALA dehydratase
(D) Coproporphyrinogen oxidase

61. The enzyme involved in variegate porphyria is

(A) Protoporphyrinogen oxidase
(B) Coproporphyrinogen oxidase
(C) Uroporphyrinogen decarboxylase
(D) ALA decarboxylase

62. Protoporphyria (erythrohepatic) is characterized by the deficiency of

(A) ALA synthase
(B) ALA hydratase
(C) Protophyrinogen oxidae
(D) Ferrochelatase

63. The amount of coproporphyrins excreted per day in feces is about

(A) 10–50 µgs (B) 100–150 µgs
(C) 200–250 µgs (D) 300–1000 µgs

64. The immunoglobulins are differentiated and also named on the basis of

(A) Electrophoretic mobility
(B) Heat stability
(C) Molecular weight
(D) Sedimentaiton coefficient like 7 S, 19 S etc.

65. The immunoglobulins are classified on the basis of

(A) Light chains
(B) Heavy chains
(C) Carbohydrate content
(D) Electrophoretic mobility

66. All immunoglobulins contain

(A) 4 L chains
(B) 4 H chains
(C) 3 L chains
(D) 2 L chains and 2 H chains

67. An immunoglobulin molecule always contains

(A) 1 κ and 3 λ type of chains
(B) 2 κ and 2 λ type of chains
(C) 3 κ and 1λ type of chains
(D) 2 κ and 2 λ chains

68 . The number of types of H chains identified in human is

(A) 2 (B) 3
(C) 4 (D) 5

69. The number of hypervariable region in L chain is

(A) 1 (B) 2
(C) 3 (D) 4

70. The number of hypervariable region in H chain is

(A) 1 (B) 2
(C) 3 (D) 4

71. Type γ H chain is present in

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

72. Type α H chain is present in

(A) Ig E (B) Ig A
(C) Ig M (D) Ig D

73. Type µ H chain is present in

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

74. Type δ H chain is present in

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

75. Type ε H chain is present in

(A) Ig A (B) Ig M
(C) Ig D (D) Ig E

76. A 'J' chain is present in

(A) Ig D (B) Ig M
(C) Ig G (D) Ig E

77. A secretory protein T chain (T protein) is present in

(A) Ig A (B) Ig M
(C) Ig D (D) Ig E

78. A pentamer immunoglobulin is

(A) Ig G (B) Ig A
(C) Ig M (D) Ig E

79. The portion of the immunoglobulin molecule that binds the specific antigen is formed by

(A) Variable regions of H and L chains
(B) Constant region of H chain
(C) Constant region of L chain
(D) Hinge region

80. The class specific function of the different immunoglobulin molecules is constituted by

(A) Variable region of L chain
(B) Constant region of H chain
(C) Variable region of H chain
(D) Constant region particularly C_H2 and C_H3 of H chain

81. Hinge region, the region of Ig molecule which is flexible and more exposed to enzymes is the

(A) Region between first and second constant regions of H chain (domains C_H1 and C_H2)
(B) Region between second and third constant regions of H chain (C_H2 and C_H3)
(C) Variable regions of H chain
(D) Variable regions of L chain

82. The smallest immunoglobulin is

(A) Ig G (B) Ig E
(C) Ig D (D) Ig A

83. The number of sub classes of Ig G is

(A) 2 (B) 3
(C) 4 (D) 8

84. Most abundant Ig G subclass in the serum is

(A) Ig G_1 (B) Ig G_2
(C) Ig G_3 (D) Ig G_4

85. The immunoglobulin which can cross the placenta is

(A) Ig A (B) Ig M
(C) Ig G (D) Ig D

86. The immunoglobulin possessing lowest concentration of carbohydrate is

(A) Ig A (B) Ig E
(C) Ig M (D) Ig G

87. The normal serum level of Ig G is

(A) 1200 mg% (B) 500 mg%
(C) 300 mg% (D) 200 mg%

88. The half life of Ig G is

(A) 2–8 days (B) 1–4 days
(C) 19–24 days (D) 6 days

89. Most heat labile immunoglobulin is

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

90. The immunoglobulin possessing highest concentration of carbohydrate is

(A) Ig G (B) Ig M
(C) Ig A (D) Ig D

91. The normal serum level of Ig D is

(A) 1 mg% (B) 2 mg%
(C) 3 mg% (D) 5 mg%

92. The half life of Ig D is

(A) 1 day (B) 2–8 days
(C) 10–15 days (D) 20–24 days

93. The carbohydrate content of Ig M is about

(A) 2.8% (B) 6.4%
(C) 8.0% (D) 10.2%

94. The immunoglobulin having highest sedimentation coefficient is

(A) Ig G (B) Ig A
(C) Ig M (D) Ig D

95. The immunoglobulin having highest molecular weight is

(A) Ig G (B) Ig M
(C) Ig E (D) Ig A

96. The half life of Ig M is

(A) 2 days (B) 4 days
(C) 5 days (D) 8 days

97. The normal serum level of Ig M is

(A) 50 mg% (B) 120 mg%
(C) 200 mg% (D) 300 mg%

98. The immunoglobulin associated with reginic antibody is

(A) Ig E (B) Ig D
(C) Ig M (D) Ig A

99. The immunoglobulin having least concentration in serum is

(A) Ig A (B) Ig M
(C) Ig D (D) Ig E

100. The half life of Ig E protein is

(A) 1–6 days (B) 2–8 days
(C) 10 days (D) 20 days

101. The immunoglobulin which provides highest antiviral activity is

(A) Ig D (B) Ig E
(C) Ig A (D) Ig G

102. The half life of Ig A is

(A) 6 days (B) 2–4 days
(C) 5–10 days (D) 12–20 days

103. The normal serum level of Ig A is

(A) 100 mg% (B) 200 mg%
(C) 300 mg% (D) 400 mg%

104. Calcium is excreted by

(A) Kidney
(B) Kidney and intestine
(C) Kidney and liver
(D) Kidney and pancreas

105. A decrease in the ionized fraction of serum calcium causes

(A) Tetany (B) Rickets
(C) Osteomalacia (D) Osteoporosis

106. A rise in blood calcium may indicate

(A) Paget's disease (B) Rickets
(C) Osteomalacia (D) Hypervitaminosis D

107. The normal serum level of phosphorus in human adult is

(A) 1–2 mg (B) 2–3 mg
(C) 3–4.5 mg (D) 5–7 mg

108. An increase in carbohydrate metabolism is accompanied by temporary decrease in serum:

(A) Calcium (B) Phosphate
(C) Iron (D) Sodium

109. In rickets of the common low-phosphate variety, serum phosphate values may go as low as

(A) 1–2 mg/100 ml (B) 2–3 mg/100 ml
(C) 3–4 mg/100 ml (D) 4–5 mg/100 ml

110. The normal serum level of phosphorous in children varies from

(A) 1–2 mg/100 ml (B) 2–3 mg/100 ml
(C) 3–4 mg/100 ml (D) 4–7 mg/100 ml

111. An inherited or acquired renal tubular defect in the reabsorption of phosphate (Vit D resistant ricket) is characterized with

(A) Normal serum Phosphate
(B) High serum phosphate
(C) A low blood phosphorous with elevated alkaline Phosphate
(D) A high blood phosphorous with decreased alkaline phosphatase

112. The total magnesium content in gms of human body is about

(A) 5 (B) 10
(C) 15 (D) 21

113. Iron is a component of

(A) Hemoglobin (B) Ceruloplasmin
(C) Transferase (D) Transaminase

114. Daily requirement of iron for normal adult male is about

(A) 5 mg (B) 10 mg
(C) 15 mg (D) 20 mg

115. The normal content of protein bound iron (PBI) in the plasma of males is

(A) 120–140 μg/100 ml
(B) 200–300 μg/100 ml
(C) 120–140 μg/100 ml
(D) 200–300 μg/100 ml

116. In iron deficiency anemia

(A) The plasma bound iron is low
(B) The plasma bound iron is high
(C) Total iron binding capacity is low
(D) Both the plasma bound iron and total iron binding capacity are low

117. The total iron content of the human body is

(A) 400–500 mg (B) 1–2 g
(C) 2–3 g (D) 4–5 g

118. In hepatic diseases

(A) Both the bound iron and total iron binding capacity of the plasma may be low
(B) Both the bound iron and total iron binding capacity of the plasma may be high
(C) Only bound iron may be high
(D) Only the total iron binding capacity may be high

119. The recommended daily requirement of iron for women of 18–55 yrs age is

(A) 5 mg (B) 8 mg
(C) 10 mg (D) 15 mg

120. The percent of total iron in body in hemoglobin is

(A) 10–20 (B) 20–30
(C) 30–40 (D) 60–70

121. A hypochromic microcytic anemia with increased iron stores in the bone marrow may be

(A) Iron responsive
(B) Pyridoxine responsive
(C) Vitamin B_{12} responsive
(D) Folate responsive

122. A good source of iron is

(A) Spinach (B) Milk
(C) Tomato (D) Potato

123. The best source of iron is

(A) Organ meats (B) Milk
(C) Tomato (D) Potato

124. An increased serum iron and decreased iron binding capacity is found in

(A) Fe deficiency anemia
(B) Sideroblastic anemia
(C) Folate deficiency anemia
(D) Sickle cell anemia

125. The absorption of iron is increased 2–10 times of normal in

(A) Iron deficiency anemia
(B) Pregnancy
(C) Spherocytosis
(D) Sickle cell anemia

126. Iron is mainly absorbed from

(A) Stomach and duodenum
(B) Ileum
(C) Caecum
(D) Colon

127. The iron containing nonporphyrin is

(A) Hemosiderin (B) Catalase
(C) Cytochrome C (D) Peroxidase

128. Molecular iron is

(A) Stored primarily in the spleen
(B) Exreted in the urine as Fe^{2+}
(C) Stored in the body in combination with ferritin
(D) Absorbed in the ferric form

129. In hemochromatosis, the liver is infiltrated with

(A) Iron (B) Copper
(C) Molybdenum (D) Fats

130. An acquired siderosis-Bantu siderosis is due to

(A) Foods cooked in iron pots
(B) Diet high in phosphorous
(C) Diet high in calcium
(D) High fat diet

131. The amount of copper in the human body is

(A) 50–80 mg (B) 100–150 mg
(C) 400–500 mg (D) 500–1000 mg

132. The amount of copper in muscles is about

(A) 10 mg (B) 30 mg
(C) 64 mg (D) 100 mg

133. The amount of copper in bones is about

(A) 5 mg (B) 10 mg
(C) 15 mg (D) 23 mg

134. The normal serum of concentration of copper in mg/100 ml varies between

(A) 0–5 (B) 50–100
(C) 100–200 (D) 200–300

135. The normal serum concentration of ceruloplasmin in mg/100 ml varies between

(A) 5–10 (B) 10–20
(C) 25–43 (D) 50–100

136. Recommended daily dietary requirement of copper for adults is

(A) 0.5–1 mg (B) 1.5–3.0 mg
(C) 3.5–4.5 mg (D) 4.5–5.5 mg

137. The richest source of copper is

(A) Liver
(B) Milk
(C) Legumes
(D) Green leafy vegetables

138. The cytosolic superoxide dismutase enzyme contains

(A) Cu^{2+} (B) Cu^{2+} and Zn^{2+}
(C) Zn^{2+} (D) Mn^{2+}

139. The deficiency of copper decreases the activity of the enzyme:

(A) Lysine oxidase (B) Lysine hydroxylase
(C) Tyrosine oxidase (D) Proline hydroxylase

140. Wilson's disease is a condition of toxicosis of

(A) Iron (B) Copper
(C) Chromium (D) Molybdenum

141. In Wilson's disease

(A) Copper fails to be excreted in the bile
(B) Copper level in plasma is decreased
(C) Ceruloplasmin level is increased
(D) Intestinal absorption of copper is decreased

142. Menke's disease is due to an abnormality in the metabolism of

(A) Iron (B) Manganese
(C) Magnesium (D) Copper

143. Menke's disease (Kinky or steel hair disease) is a X-linked disease characterized by

(A) High levels of plasma copper
(B) High levels of ceruloplasmin
(C) Low levels of plasma copper and of ceuloplasmin
(D) High level of hepatic copper

144. The trace element catalyzing hemoglobin synthesis is

(A) Manganese (B) Magnesium
(C) Copper (D) Selenium

145. The total body content of manganese is about

(A) 2 mg (B) 4 mg
(C) 8 mg (D) 10 mg

146. In blood the values of manganese in μg / 100 ml varies between

(A) 0–4 (B) 2–4
(C) 3–5 (D) 4–20

147. The adequate daily dietary requirement of manganese is

(A) 1–2 mg (B) 2–5 mg
(C) 5–10 mg (D) 10–20 mg

148. Mitochondrial superoxide dismutase contains

(A) Zinc (B) Copper
(C) Magnesium (D) Manganese

149. Mitochondrial pyruvate carboxylase contains

(A) Zinc (B) Zinc
(C) Manganese (D) Magnesium

150. The adequate daily dietary requirement of molybdenum for normal human adult is

(A) 10–20 μg (B) 25–50 μg
(C) 50–70 μg (D) 75–200 μg

151. In human beings molybdenum is mainly absorbed from

(A) Liver (B) Kidney
(C) Intestine (D) Pancreas

152. In human beings molybdenum is mainly excreted in

(A) Feces (B) Sweat
(C) Urine (D) Tears

153. Molybdenum is a constituent of

(A) Hydroxylases (B) Oxidases
(C) Transaminases (D) Transferases

154. Safe and adequate daily dietary intake of chromium in adults in mg is

(A) 0.01–0.02 (B) 0.02–0.03
(C) 0.03–0.04 (D) 0.05–0.2

155. Richest source of chromium is

(A) Brewer's yease
(B) Milk and milk products
(C) Yellow vegetables
(D) Green vegetables

156. Metallic constituent of "Glucose tolerance factor" is

(A) Sulphur (B) Cobalt
(C) Chromium (D) Selenium

157. Intestinal absorption of chromium is shared with

(A) Mn (B) Mg
(C) Ca (D) Zn

158. Serum level of chromium in healthy adult is about

(A) 2-5 μg/100 ml (B) 6-20 μg/100 ml
(C) 30-60 μg/100 ml (D) 50-100 μg/100 ml

159. Chromium is potentiator of

(A) Insulin (B) Glucagon
(C) Thyroxine (D) Parathromone

160. Recommended daily dietary allowance of selenium for adult human in μg is

(A) 20 (B) 40
(C) 50 (D) 70

161. Total body content of selenium is about

(A) 1–2 mg (B) 2–4 mg
(C) 4–10 mg (D) 50–100 mg

162. Normal serum level of selenium is

(A) 5 μg /100 ml (B) 8 μg /100 ml
(C) 10 μg /100 ml (D) 13 μg /100 ml

163. Selenium is a constituent of the enzyme:

(A) Glutathione peroxidase
(B) Homogentisate oxidase
(C) Tyrosine hydroxylase
(D) Phenylalanin hydroxylase

164. A nonspecific intracellular antioxidant is

(A) Chromium (B) Magnesium
(C) Selenium (D) Nickel

165. Cobalt forms an integral part of the vitamin:

(A) B_1 (B) B_6
(C) B_{12} (D) Folate

166. Cobalt may act as cofactor for the enzyme:

(A) Glycl-glycine dipeptidase
(B) Elastase
(C) Polynucleotidases
(D) Phosphatase

167. Excess intake of cobalt for longer periods leads to

(A) Polycythemia
(B) Megaloblastic anemia
(C) Pernicious anemia
(D) Microcytic anemia

168. The total sulphur content of the body is

(A) 25–50 gm (B) 50–75 gm
(C) 100–125 gm (D) 150–200 gm

169. Sulphur is made available to the body by the amino acids:

(A) Cystine and methionine
(B) Taurine and alanine
(C) Proline and hydroxyproline
(D) Arginine and lysine

170. Sulphur containing coenzyme is

(A) NAD
(B) FAD
(C) Pyridoxal phosphate
(D) Biotin

171. Iodine is stored in

(A) Thyroid gland as thyroglobulin
(B) Liver
(C) Intestine
(D) Skin

172. Iodine is the constituent of

(A) T_3 and T_4 (B) PTH
(C) Insulin (D) Adrenaline

173. Goitrogenic substance present in cabbage is

(A) 5-vinyl-2 thio oxalzolidone
(B) Pyridine-3-carboxylic acid
(C) 3-Hydroxy-4, 5-dihydroxymethyl1–2-methyl pyridine
(D) δ-ALA dehydratase

174. For an adult male daily requirement of iodine is

(A) 25–50 μg (B) 50–100 μg
(C) 100–150 μg (D) 200–250 μg

175. Recommended daily intake of fluoride for a normal adult is

(A) 1.5–4.0 mg (B) 0–1 mg
(C) 5–10 mg (D) 10–20 mg

176. The percentage of fluoride present in normal bone is

(A) 0.01–0.03 (B) 0.04–0.08
(C) 0.10–0.12 (D) 0.15–0.2

177. The percentage of fluoride present in dental enamel is

(A) 0.01–0.02 (B) 0.05–0.10
(C) 0.15–0.20 (D) 0.20–0.40

178. Fluorosis occurs due to

(A) Drinking water containing less than 0.2 ppm of fluorine
(B) Drinking water containing high calcium
(C) Drinking water containing greater than 1.2 ppm of fluroine
(D) Drinking water containing heavy metals

179. Dental caries occur due to

(A) Drinking water containing less than 0.2 ppm of fluorine
(B) Drinking water containing greater than 1.2 ppm of fluorine
(C) Drinking water containing high calcium
(D) Drinking water containing heavy metals

180. Total zinc content of human body is about

(A) 800 mg (B) 1200 mg
(C) 2000 mg (D) 3200 mg

181. Metal required for polymerization of insulin is

(A) Copper (B) Chromium
(C) Cobalt (D) Zinc

182. Metalloenzyme-retinene for polymerization of insulin is

(A) Copper (B) Zinc
(C) Cobalt (D) Manganese

183. An important zinc containing enzyme is

(A) Carboxypeptidase A
(B) Isocitrate dehydrogenase
(C) Cholinesterate
(D) Lipoprotein lipase

184. Acrodermatitis enteropathica is due to defective absorption of

(A) Manganese (B) Molybdenum
(C) Iodine (D) Zinc

185. Hypogonadism develops due to deficiency of

(A) Sulphur (B) Cobalt
(C) Zinc (D) Manganese

186. Psychotic symptoms and parkinsonism like symptoms develop due to inhalation poisoning of

(A) Manganese (B) Phosphorous
(C) Magnesium (D) Zinc

187. One gram of carbohydrate on complete oxidation in the body yields about

(A) 1 Kcal (B) 4 Kcal
(C) 6 Kcal (D) 9 Kcal

188. One gram of fat on complete oxidation in the body yields about

(A) 4 Kcal (B) 6 Kcal
(C) 9 Kcal (D) 12 Kcal

189. One gram of protein on complete oxidation in the body yields about

(A) 2 Kcal (B) 4 Kcal
(C) 8 Kcal (D) 12 Kcal

190. R.Q. of mixed diet is about

(A) 0.70 (B) 0.80
(C) 0.85 (D) 1.0

191. R.Q. of proteins is about

(A) 0.70 (B) 0.75
(C) 0.80 (D) 0.85

192. R.Q. of carbohydrates is about

(A) 0.75 (B) 0.80
(C) 0.85 (D) 1.0

193. R.Q. of fats is about

(A) 0.75 (B) 0.80
(C) 0.85 (D) 1.0

194. Proteins have the SDA:

(A) 5% (B) 10%
(C) 20% (D) 30%

195. Humans most easily tolerate a lack of the nutrient:

(A) Protein (B) Lipid
(C) Iodine (D) Carbohydrate

196. The basal metabolic rate (B.M.R.) is measurement of

(A) Energy expenditure during sleep
(B) Energy expenditure after 100 m walk
(C) Energy expenditure after a meal
(D) Energy expenditure under certain basal (Standard) conditions

197. B.M.R. is raised in

(A) Polycythemia (B) Starvation
(C) Lipid nephrosis (D) Hypothyroidism

198. B.M.R. is lowered in

(A) Hypothyroidism (B) Leukemia
(C) Cardiac failure (D) Hyperthyroidism

199. B.M.R. is subnormal in

(A) Addison's disease
(B) Adrenal tumour
(C) Cushing's syndrome
(D) Fever

200. A healthy 70 kg man eats a well balanced diet containing adequate calories and 62.5 g of high quality protein per day. Measured in grams of nitrogen, his daily nitrogen balance would be

(A) +10 g (B) +6.25 g
(C) 0 g (D) –6.25 g

201. The percentage of nitrogen retained in the body after absorption of diet represents

(A) Digestibility coefficient of proteins
(B) Biological value of proteins
(C) Protein efficiency ratio
(D) Net protein utilisation

202. In a person increase in weight in gms per gm of protein consumption represents

(A) Protein efficiency ratio
(B) Digestibility value of proteins
(C) Biological value of proteins
(D) Net protein utilisation

203. The percentage of food nitrogen that is retained in the body represents

(A) Digestibility coefficient
(B) Biological value of proteins
(C) Protein efficiency ratio
(D) Net protein utilisation

204. The chemical score of different proteins is calculated in terms of

(A) Egg proteins (B) Milk proteins
(C) Fish proteins (D) Wheat proteins

205. Biological value of egg protein is

(A) 94 (B) 60
(C) 51 (D) 40

206. Biological value of protein of cow's milk is

(A) 95 (B) 60
(C) 71 (D) 67

207. Biological value of soyabean protein is

(A) 86 (B) 71
(C) 64 (D) 54

208. Plasma bicarbonate is decreased in

(A) Respiratory alkalosis
(B) Respiratory acidosis
(C) Metabolic alkalosis
(D) Metabolic acidosis

209. Plasma bicarbonate is increased in

(A) Respiratory alkalosis
(B) Metabolic alkalosis
(C) Respiratory acidosis
(D) Metabolic acidosis

210. Total CO_2 is increased in

(A) Respiratory acidosis
(B) Metabolic alkalosis
(C) Both respiratory acidosis and metabolic alkalosis
(D) Respiratory alkalosis

211. Respiratory acidosis is caused by

(A) Increase in carbonic acid relative to bicarbonate
(B) Decrease in bicarbonate fraction
(C) Increase in bicarbonate fraction
(E) Decrease in the carbonic acid fraction

212. Respiratory alkalosis is caused by

(A) An increase in carbonic acid fraction
(B) A decrease in bicarbonic fraction
(C) A decrease in the carbonic acid fraction
(D) An increase in bicarbonate fraction

213. Meningitis and encephalitis cause

(A) Metabolic alkalosis
(B) Respiratory alkalosis
(C) Metabolic acidosis
(D) Respiratory acidosis

214. Metabolic acidosis is caused in

(A) Uncontrolled diabetes with ketosis
(B) Pneumonia
(C) Intestinal Obstruction
(D) Hepatic coma

215. Metabolic acidosis is caused in

(A) Pneumonia
(B) Prolonged starvation
(C) Intestinal obstruction
(D) Bulbar polio

216. Respiratory acidosis occurs in

(A) Any disease which impairs respiration like emphysema
(B) Renal disease
(C) Poisoning by an acid
(D) Pyloric stenosis

217. Metabolic alkalosis occurs

(A) As consequence of high intestinal obstruction
(B) In central nervous system disease
(C) In diarrhoea
(D) In colitis

218. Respiratory alkalosis occurs in

(A) Hysterical hyperventilation
(B) Depression of respiratory centre
(C) Renal diseases
(D) Loss of intestinal fluids

219. Morphine poisoning causes

(A) Metabolic acidosis
(B) Respiratory acidosis
(C) Metabolic alkalosis
(D) Respiratory alkalosis

220. Salicylate poisoning in early stages causes

(A) Metabolic acidosis
(B) Respiratory acidosis
(C) Metabolic alkalosis
(D) Respiratory alkalosis

221. The compound having the lowest redox potential amongst the following is

(A) Hydrogen (B) NAD
(C) Cytochrome b (D) Cytochrome a

222. All the oxidases contain a metal which is

(A) Copper (B) FAD
(C) Manganese (D) None of these

223. Isocitrate dehydrogenases is

(A) Aerobic dehydrogenase
(B) Anaerobic dehydrogenase
(C) Hydroperoxidase
(D) Oxygenase

224. Iron-pophyrin is present as prosthetic group in

(A) Cytochromes (B) Catalases
(C) Peroxidase (D) None of these

225. Microsomal hydroxylase system contains a

(A) Di-oxygenase (B) Mono-oxygenase
(C) Both (A) and (B) (D) None of thse

226. Superoxide radicals can be detoxified by

(A) Cytochrome c (B) Cytochrome b
(C) Cytochrome a (D) None of these

227. A copper containing cytochrome is

(A) Cytochrome a (B) Cytochrome P-450
(C) Cytochrome a_3 (D) None of these

228. Rate of tissue respiration is raised when the intracellular concentration of

(A) ADP increases (B) ATP increases
(C) ADP decreases (D) None of these

229. Which of the following component of respiratory chain is not attached to the inner mitochondrial membrane?

(A) Coenzyme Q (B) Cytochrome c
(C) Both (A) and (B) (D) None of these

230. In some reactions, energy is captured in the form of

(A) GTP (B) UTP
(C) CTP (D) None of these

231. Substrate-linked phosphorylation occurs in

(A) Glycolytic pathway (B) Citric acid cycle
(C) Both (A) and (B) (D) None of these

232. Hydrogen peroxide may be detoxified in the absence of an oxygen acceptor by

(A) Peroxidase (B) Catalase
(C) Both (A) and (B) (D) None of these

233. Superoxide radicals can be detoxified by

(A) Cytochrome c
(B) Superoxide dismutase
(C) Both (A) and (B)
(D) None of these

234. The porphyrin present in haem is

(A) Uroporphyrin (B) Protoporphyrin I
(C) Coproporphyrin (D) Protoporphyrin II

235. An amino acid required for porphyrin synthesis is

(A) Proline (B) Glycine
(C) Serine (D) Histidine

236. Which of the following coenzyme is required for porphyrin synthesis?

(A) Coenzyme A
(B) Pyridoxal phosphate
(C) Both (A) and (B)
(D) None of these

237. The regulatory enzyme for haem synthesis is

(A) ALA synthetase
(B) haem synthetase
(C) Both (A) and (B)
(D) None of these

238. Regulation of haem synthesis occurs by

(A) Covalent modification
(B) Repression - derepression
(C) Induction
(D) Allosteric regulation

239. Sigmoidal oxygen dissociation curve is a property of

(A) Haemoglobin
(B) Carboxyhaemoglobin
(C) Myoglobin
(D) Methaemoglobin

240. Cyanmethaemoglobin can be formed from

(A) Oxy Hb (B) Met Hb
(C) Carboxy Hb (D) All of these

241. In thalassemia, an amino acid is substituted in

(A) Alpha chain
(B) Beta chain
(C) Alpha and beta chains
(D) Any chain

242. Haem synthetase is congenitally deficient in

(A) Congenital erythropoietic porphyria
(B) Protoporphyria
(C) Hereditary coproporphyria
(D) Variegate porphyria

243. During breakdown of haem, the methenyl bridge between the following two pyrrole rings is broken:

(A) I and II (B) II and III
(C) III and IV (D) IV and I

244. Pre- hepatic jaundice occurs because of

(A) Increased haemolysis
(B) Liver damage
(C) Biliary obstruction
(D) None of these

245. kernicterus can occur in

(A) Haemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) All of these

246. Bile pigments are not present in urine in

(A) Haemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) Rotor's syndrome

247. Serum alkaline phosphatase is greatly increased in

(A) Haemolytic jaundice
(B) Hepatic jaundice
(C) Obstructive jaundice
(D) None of these

248. The active transport system for hepatic uptake of bilirubin is congenitally defective in

(A) Gilbert's disease
(B) Crigler-Najjar syndrome
(C) Rotor's syndrome
(D) Dubin-Johnson syndrome

249. Bilirubin UDP-glucuronyl transferase is absent from liver in

(A) Crigler-Najjar syndrome, type I
(B) Gilbert's disease
(C) Crigler-Najjar syndrome, type II
(D) Rotor's syndrome

250. Unconjugated bilirubin in serum is soluble in

(A) Water (B) Alkalis
(C) Acids (D) Methanal

251. Excretion of conjugated bilirubin from liver cells into biliary canaliculi is defective in

(A) Gilbert's disease
(B) Crigler-Najjar syndrome
(C) Lucey-Driscoll syndrome
(D) Rotor's syndrome

252. Breakdown of 1gm haemoglobin produces

(A) 20 mg of bilirubin (B) 35 mg of bilirubin
(C) 50 mg of bilirubin (D) 70 mg of bilirubin

253. Variable regions are present in

(A) Immunoglobulins
(B) α-Chains of T cell receptors
(C) β-Chains of T cell receptors
(D) All of these

254. The total amount of calcium in an average adult man is about

(A) 100 gm (B) 500 gm
(C) 1 kg (D) 10 kg

255. The following proportion of the total body calcium is present in bones and teeth:

(A) 75% (B) 90%
(C) 95% (D) 99%

256. The normal range of plasma calcium is

(A) 3-5 mg/dl (B) 5-10 mg/dl
(C) 9-11 mg/dl (D) 11-15 mg/dl

257. Which of the normal range of ionized calcium in plasma is

(A) 2-4 mg/dl (B) 2-4 mEq/L
(C) 4-5 mg/dl (D) 4-5 mEq/L

258. Tetany can occur in

(A) Hypocalcaemia
(B) Hypercalcaemia
(C) Alkalosis
(D) Hypocalcaemia and alkalosis

259. Intestinal absorption of calcium occurs by

(A) Active takeup
(B) Simple diffusion
(C) Facilitated diffusion
(D) Endocytosis

260. Intestinal absorption of calcium is hampered by

(A) Phosphate (B) Phytate
(C) Proteins (D) Lactose

261. Calcitriol facilitates calcium absorption by increasing the synthesis of the following in intestinal mucosa:

(A) Calcium Binding Protein
(B) Alkaline Phosphatase
(C) Calcium-dependent ATPase
(D) All of these

262. A high plasma calcium level decreases intestinal absorption of calcium by

(A) Stimulating the secretion of parathormone
(B) Inhibiting the secretion of parathormone
(C) Decreasing the synthesis of cholecalciferol
(D) Inhibiting the secretion of thyrocalcitonin

263. The daily calcium requirement of an adult man is about

(A) 400 mg (B) 600 mg
(C) 800 mg (D) 1,000 mg

264. The daily calcium requirement in pregnancy and lactation is about

(A) 600 mg (B) 800 mg
(C) 1,200 mg (D) 1,500 mg

265. Hypercalcaemia can occur in all the following except

(A) Hyperparathyroidism
(B) Hypervitaminosis D
(C) Milk alkali syndrome
(D) Nephrotic syndrome

266. Hypocalcaemia can occur in all the following except

(A) Rickets
(B) Osteomalacia
(C) Hyperparathyroidism
(D) Intestinal malabsorption

267. The major calcium salt in bones is

(A) Calcium carbonate
(B) Calcium chloride
(C) Calcium hydroxide
(D) Calcium phosphate

268. The correct statement about serum inorganic phosphorous concentration is

(A) It is higher in men than in women
(B) It is higher in women than in men
(C) It is higher in adults than in children
(D) It is higher in children than in adults

269. The product of serum calcium concentration (mg/dl) and serum inorganic phosphorous concentration (mg/dl) in adults is about

(A) 30 (B) 40
(C) 50 (D) 60

270. The product of serum calcium concentration (mg/dl) and serum inorganic phosphorous concentration (mg/dl) in children is about

(A) 30 (B) 40
(C) 50 (D) 60

271. The product of serum calcium concentration (mg/dl) and serum inorganic phosphorous concentration (mg/dl) is decreased in

(A) Rickets
(B) Hypoparathyroidism
(C) Hyperparathyroidism
(D) Renal failure

272. Serum inorganic phosphorous rises in all the following conditions except

(A) Hypoparathyroidism
(B) Hypervitaminosis D
(C) Chronic renal failure
(D) After a carbohydrate-rich meal

273. Serum inorganic phosphorous decreases in all the following conditions except

(A) Hyperparathyroidism
(B) Intestinal malabsorption
(C) Osteomalacia
(D) Chronic renal failure

274. Serum magnesium level ranges between

(A) 2–3 mg/dl (B) 3–5 mg/dl
(C) 6–8 mg/dl (D) 9–11 mg/dl

275. Magnesium ions are required in the reactions involving

(A) NAD (B) FAD
(C) ATP (D) CoA

276. Normal range of serum sodium is

(A) 30–70 mEq/L (B) 70–110 mEq/L
(C) 117–135 mEq/L (D) 136–145 mEq/L

277. Sodium is involved in the active uptake of

(A) D-Glucose (B) D-Galactose
(C) L-Amino acids (D) All of these

278. Aldosterone increases reabsorption of sodium in

(A) Proximal convoluted tubules
(B) Ascending limb of loop of Henle
(C) Descending limb of loop of Henle
(D) Distal convoluted tubules

279. Restriction of sodium intake is commonly advised in

(A) Addison's disease (B) Diarrhoea
(C) Hypertension (D) None of these

280. Serum sodium level rises in all of the following except

(A) Renal failure
(B) Prolonged steroid therapy
(C) Aldosteronism
(D) Dehydration

281. Hyponatraemia occurs in the following condition:

(A) Addison's disease (B) Chronic renal failure
(C) Severe diarrhoea (D) All of these

282. Serum potassium level decreases in

(A) Familial periodic paralysis
(B) Addison's disease
(C) Renal failure
(D) All of these

283. Concentration of the following is higher in intracellular fluid than in extracellular fluid:

(A) Sodium (B) Potassium
(C) Chloride (D) Bicarbonate

284. Normal range of serum potassium is

(A) 2.1-3.4 mEq/L (B) 3.5-5.3 mEq/L
(C) 5.4–7.4 mEq/L (D) 7.5–9.5 mEq/L

285. Normal range of serum chloride is

(A) 24–27 mEq/L (B) 70–80 mEq/L
(C) 100–106 mEq/L (D) 120–140 mEq/L

286. An extracellular fluid having a higher concentration of chloride than serum is

(A) Bile (B) Sweat
(C) CSF (D) Pancreatic juice

287 Total amount of iron in an adult man is about

(A) 1–2 gm (B) 2–3 gm
(C) 3–4 gm (D) 6–7 gm

288. Haemoglobin contains about

(A) 30% of the total body iron
(B) 50% of the total body iron
(C) 75% of the total body iron
(D) 90% of the total body iron

289. About 5% of the total body, iron is present in

(A) Transferrin (B) Myoglobin
(C) Cytochromes (D) Haemosiderin

290. Each haemoglobin molecule contains

(A) One iron atom (B) Two iron atoms
(C) Four iron atoms (D) Six iron atoms

291. Each myoglobin molecule contains

(A) One iron atom (B) Two iron atoms
(C) Four iron atoms (D) Six iron atoms

292. Apoferritin molecule is made up of

(A) Four subunits (B) Eight subunits
(C) Ten subunits (D) Twenty-four subunits

293. Ferritin is present in

(A) Intestinal mucosa (B) Liver
(C) Spleen (D) All of these

294. Iron is stored in the form of

(A) Ferritin and transferrin
(B) Transferrin and haemosiderin
(C) Haemoglobin and myoglobin
(D) Ferritin and haemosiderin

295. Iron is transported in blood in the form of

(A) Ferritin (B) Haemosiderin
(C) Transferrin (D) Haemoglobin

296. Molecular weight of transferrin is about

(A) 40,000 (B) 60,000
(C) 80,000 (D) 1,00,000

297. Normal plasma iron level is

(A) 50100 μg/dl (B) 100150 μg/dl
(C) 50175 μg/dl (D) 250400 μg/dl

298. Iron is present in all the following except

(A) Peroxidase (B) Xanthine oxidase
(C) Aconitase (D) Fumarase

299. Total daily iron loss of an adult man is about

(A) 0.1 mg (B) 1 mg
(C) 5 mg (D) 10 mg

300. Iron absorption is hampered by

(A) Ascorbic acid (B) Succinic acid
(C) Phytic acid (D) Amino acid

301. Iron absorption is hampered by

(A) In achlorhydria
(B) When ferritin content of intestinal mucosa is low
(C) When saturation of plasma transferring is low
(D) When erythropoietic activity is increased

302. Daily iron requirement of an adult man is about

(A) 1 mg (B) 5 mg
(C) 10 mg (D) 18 mg

303. Daily iron requirement of a woman of reproductive age is about

(A) 1 mg (B) 2 mg
(C) 10 mg (D) 20 mg

304. All the following are good sources of iron except

(A) Milk (B) Meat
(C) Liver (D) Kidney

305. Relatively more iron is absorbed from

(A) Green leafy vegetables
(B) Fruits
(C) Whole grain cereals
(D) Organ meats

306. Iron absorption from a mixed diet is about

(A) 1–5 % (B) 5–10 %
(C) 20–25 % (D) 25–50 %

307. Iron deficiency causes

(A) Normocytic anaemia
(B) Microcytic anaemia
(C) Megaloblastic anaemia
(D) Pernicious anaemia

308. Prolonged and severe iron deficiency can cause astrophy of epithelium of

(A) Oral cavity (B) Oesophagus
(C) Stomach (D) All of these

309. All of the following statements about bronzed diabetes are true except

(A) It is caused by excessive intake of copper
(B) Skin becomes pigmented
(C) There is damage to β cells of Islets of Langerhans
(D) Liver is damaged

310. The total amount of iodine in the body of an average adult is

(A) 10–15 mg (B) 20–25 mg
(C) 45–50 mg (D) 75–100 mg

311. Iodine content of thyroid gland in an adult is about

(A) 1–3 mg (B) 4–8 mg
(C) 10–15 mg (D) 25–30 mg

312. Daily iodine requirement of an adult is about

(A) 50 μg (B) 100 μg
(C) 150 μg (D) 1 mg

313. Consumption of iodised salt is recommended in

(A) Patients with hyperthyroidism
(B) Patients with hypothyroidism
(C) Pregnant women
(D) Goitre belt areas

314. All the following statements about endemic goiter are true except

(A) It occurs in areas where soil and water have low iodine content
(B) It leads to enlargement of thyroid gland
(C) It results ultimately in hyperthyroidism
(D) It can be prevented by consumption of iodised salt

315. The total amount of copper in the body of an average adult is

(A) 1 gm (B) 500 mg
(C) 100 mg (D) 10 mg

316. The normal range of plasma copper is

(A) 25–50 μg/dl (B) 50–100 μg/dl
(C) 100–200 μg/dl (D) 200–400 μg/dl

317. Copper deficiency can cause

(A) Polycythaemia (B) Leukocytopenia
(C) Thrombocytopenia (D) Microcytic anaemia

318. Daily requirement of copper in adults is about

(A) 0.5 mg (B) 1 mg
(C) 2.5 mg (D) 5 mg

319. All the following statements about ceruloplasmin are correct except

(A) It is a copper-containing protein
(B) It possesses oxidase activity
(C) It is synthesised in intestinal mucosa
(D) Its plasma level is decreased inWilson's disease

320. All the following statements about Wilson's disease are correct except

(A) It is a genetic disease
(B) The defect involves copper-dependent P-type ATPase
(C) Copper is deposited in liver, basal ganglia and around cornea
(D) Plasma copper level is increased in it

321. Which of the following statements about Menke's disease are true.

(A) It is an inherited disorder of copper metabolism
(B) It occurs only in males
(C) Plasma copper is increased in it
(D) Hair becomes steely and kinky in it

322. The total amount of zinc in an average adult is

(A) 0.25–0.5 gm (B) 0.5–1.0 gm
(C) 1.5–2.0 gm (D) 2.5–5.0 gm

323. Plasma zinc level is

(A) 10–50 μg/dl (B) 50–150 μg/dl
(C) 150–250 μg/dl (D) 250–500 μg/dl

324. Zinc is a cofactor for

(A) Acid phosphatase
(B) Alkaline phosphatase
(C) Amylase
(D) Lipase

325. Zinc is involved in storage and release of

(A) Histamine (B) Acetylcholine
(C) Epinephrine (D) Insulin

326. Intestinal absorption of zinc is retarded by

(A) Calcium (B) Cadmium
(C) Phytate (D) All of these

327. The daily zinc requirement of an average adult is

(A) 5 mg (B) 10 mg
(C) 15 mg (D) 25 mg

328. Zinc deficiency occurs commonly in

(A) Acrodermatitis enteropathica
(B) Wilson's disease
(C) Xeroderma pigmentosum
(D) Menke's disease

329. Hypogonadism can occur in deficiency of

(A) Copper (B) Chromium
(C) Zinc (D) Manganese

330. Healing of wounds may be impaired in deficiency of

(A) Selenium (B) Copper
(C) Zinc (D) Cobalt

331. Hypochromic microcytic anaemia can occur in

(A) Zinc (B) Copper
(C) Manganese (D) None of these

332. The daily requirement for manganese in adults is about

(A) 1–2 mg (B) 2–5 mg
(C) 2–5 µg (D) 5–20 µg

333. Molybdenum is a cofactor for

(A) Xanthine oxidase (B) Aldehyde oxidase
(C) Sulphite oxidase (D) All of these

334. A trace element having antioxidant function is

(A) Selenium (B) Tocopherol
(C) Chromium (D) Molybdenum

335. Selenium is a constituent of

(A) Glutathione reductase
(B) Glutathione peroxidase
(C) Catalase
(D) Superoxide dismutase

336. Selenium decreases the requirement of

(A) Copper (B) Zinc
(C) Vitamin D (D) Vitamin E

337. Upper safe limit of fluorine in water is

(A) 0.4 ppm (B) 0.8 ppm
(C) 1.2 ppm (D) 2 ppm

338. The daily fluoride intake should not exceed

(A) 0.5 mg (B) 1 mg
(C) 2 mg (D) 3 mg

339. In adults, water constitutes about

(A) 50% of body weight
(B) 55% of body weight
(C) 60% of body weight
(D) 75% of body weight

340. 1 kcal is roughly equal to

(A) 4.2 J (B) 42 J
(C) 4.2 KJ (D) 42 KJ

341. Calorific value of proteins as determined in a bomb calorimeter is

(A) 4 kcal/gm (B) 4.8 kcal/gm
(C) 5.4 kcal/gm (D) 5.8 kcal/gm

342. Calorific value of proteins in a living person is less than that in a bomb calorimeter because

(A) Digestion and absorption of proteins is less than 100%
(B) Respiratory quotient of proteins is less than 1
(C) Specific dynamic action of proteins is high
(D) Proteins are not completely oxidized in living persons

343. Calorific value of alcohol is

(A) 4 kcal/gm (B) 5.4 kcal/gm
(C) 7 kcal/gm (D) 9 kcal/gm

344. Energy expenditure of a person can be measured by

(A) Bomb calorimetry
(B) Direct calorimetry
(C) Indirect calorimetry
(D) Direct or indirect calorimetry

345. Respiratory quotient of carbohydrates is about

(A) 0.5 (B) 0.7
(C) 0.8 (D) 1.0

346. Respiratory quotient of fats is about

(A) 0.5 (B) 0.7
(C) 0.8 (D) 1.0

347. Respiratory quotient of proteins is about

(A) 0.5 (B) 0.7
(C) 0.8 (D) 1.0

348. Respiratory quotient of an average mixed diet is about

(A) 0.65 (B) 0.7
(C) 0.75 (D) 0.85

349. At a respiratory quotient of 0.85, every litre of oxygen consumed represents an energy expenditure of

(A) 5.825 kcal (B) 4.825 kcal
(C) 3.825 kcal (D) 2.825 kcal

350. BMR of healthy adult men is about

(A) 30 kcal/hour/square metre
(B) 35 kcal/hour/square metre
(C) 40 kcal/hour/square metre
(D) 45 kcal/hour/square metre

351. BMR of healthy adult women is about

(A) 32 kcal/hour/square metre
(B) 36 kcal/hour/square metre
(C) 40 kcal/hour/square metre
(D) 44 kcal/hour/square metre

352. BMR is higher in

(A) Adults than in children
(B) Men than in women
(C) Vegetarians than in non-vegetarians
(D) Warmer climate than in colder climate

353. BMR is decreased in

(A) Pregnancy (B) Starvation
(C) Anaemia (D) Fever

354. BMR is increased in

(A) Starvation (B) Hypothyroidism
(C) Addison's disease (D) Pregnancy

355. BMR is decreased in all of the following except

(A) Fever (B) Addison's disease
(C) Starvation (D) Hypothyroidism

356. BMR is increased in all of the following except

(A) Hyperthyroidism (B) Anaemia
(C) Addison's disease (D) Pregnancy

357. Specific dynamic action of carbohydrates is about

(A) 5% (B) 13%
(C) 20% (D) 30%

358. Specific dynamic action of proteins is about

(A) 5% (B) 13%
(C) 20% (D) 30%

359. All following are essential trace elements except

(A) Iron (B) Iodine
(C) Zinc (D) Cadmium

360. Maximum quantity of sodium is excreted through

(A) Urine (B) Faeces
(C) Sweat (D) None of these

361. All followings are rich sources of magnesium, except

(A) Milk (B) Eggs
(C) Meat (D) Cabbage

362. All followings are poor sources of iron except

(A) Milk (B) Potatoes
(C) Wheat flour (D) Liver

363. The Iron deficient children, absorption of Iron from GIT is

(A) Unaltered
(B) Double than in normal child
(C) Manifold than in normal child
(D) Lesser than in normal child

364. Main source of fluoride for human beings is

(A) Milk (B) Water
(C) Vegetables (D) Eggs

365. Quantity of copper present in the body of an adult is

(A) 0–50 mg (B) 50–100 mg
(C) 100–150 mg (D) 150–250 mg

366. A level of 310–340 mg per 1000 ml of blood is normal for the

(A) Copper (B) Iron
(C) Potassium (D) Sodium

367. Daily requirement of phosphorous for an infant is

(A) 240–400 mg (B) 1.2 gms
(C) 800 mg (D) 800–1200 mg

368. Maximum quantity of Zinc is present in the body in

(A) Prostate (B) Choroid
(C) Skin (D) Bones

369. Average concentration of chloride ions in cerebrospinal fluid per 100 ml is

(A) 40 mg (B) 440 mg
(C) 160 mg (D) 365 mg

370. Total iron content of the normal adult is

(A) 1-2 gm (B) 3-4 gm
(C) 4-5 gm (D) 7-10 gm

371. Absorption of phosphorous from diet is favoured by

(A) Moderate amount of fat
(B) Acidic environment
(C) High calcium content
(D) High phytic acid

372. Daily intake of potassium for a normal person should be

(A) 1 gm (B) 2 gm
(C) 3 gm (D) 4 gm

373. Absorption of calcium decreases if there is high concentration in the diet of

(A) Copper (B) Sodium
(C) Magnesium (D) Cadmium

374. Of the following highest concentration of calcium is seen in

(A) Blood (B) CSF
(C) Muscle (D) Nerve

375. Cobalt is essential component of

(A) Vitamin B_1 (B) Vitamin B_6
(C) Vitamin B_{12} (D) All of these

376. Iodine is required in human body for

(A) Formation of thyroxine
(B) Formation of Glutathione
(C) Formation of potassium iodide
(D) Adrenalin

377. A hypochromic necrocytic anaemia with increase Fe stores in the bone marrow may be

(A) Folic acid responsive
(B) Vitamin B_{12} responsive
(C) Pyridoxine responsive
(D) Vitamin C responsive

378. A deficiency of copper effects the formation of normal collagen by reducing the activity of which of the following enzyme?

(A) Prolyl hydroxylase
(B) Lysyl oxidase
(C) Lysyl hydroxylase
(D) Glucosyl transferase

379. Molecular iron (Fe) is

(A) Stored primarily in spleen
(B) Absorbed in the intestine
(C) Absorbed in the ferric, Fe^{+++} form
(D) Stored in the body in combination with ferritin

380. All the following statements regarding calcium are correct except

(A) It diffuses as a divalent cation
(B) It freely diffuses across the endoplasmic reticulum of muscle cells
(C) It can exist in the blood as ionic form and also protein bound
(D) It is found in high concentration in bones

381. Iron is absorbed from

(A) Stomach
(B) Duodenum and jejunum
(C) Ileum
(D) Noen of the above

382. The normal route of calcium excretion is

(A) Kidney
(B) Kidney and Liver
(C) Kidney and Intestine
(D) Kidney, Intestine and Pancreas

383. Hypocalcaemia affects

(A) Skeletal muslces
(B) Smooth muscles
(C) Cardiac muscles
(D) Skeletal muscles + smooth muscles + cardiac muscles

384. Transferrin is a type of

(A) Albumin (B) α-globulin
(C) β_1 globulin (D) γ-globulin

385. In case of wilson's disease, the features include all of the following except

(A) Progressive hepatic cirrhosis
(B) Keyser Fleisher ring
(C) Aminoaciduria
(D) Urinary excretion of Cu is decreased

386. In Vitamin D poisoning (hyper-vitaminosis)

(A) Both serum and urinary "Ca"
(B) The serum Ca is low and urinary calcium high
(C) The serum "Ca" is increased and urinary "Ca" is normal
(D) Both serum and urinary "Ca" are low

387. The % of 'K' in Extracellular fluid is about

(A) 1% (B) 2 to 3%
(C) 10% (D) 15%

388. The Fe containing pigments is

(A) Haematoidin (B) Bilirubin
(C) Hemasiderin (D) Urobilinogen

389. All of the following are true of Wilson's disease except

(A) Low total plasma Cu
(B) Elevated urinary copper
(C) Arthritis
(D) Aminoaciduria

390. An increased serum 'Iron' and decreased 'Fe' binding capacity are found in

(A) Fe-deficiency anaemia
(B) Sideroblastic anaemia
(C) Thalassaemia
(D) Anaemia of chromic disorders

391. Iron therapy is ineffective in which of the following conditions:

(A) Chronic blood loss
(B) Inadequate Fe intake
(C) Hypochromic anaemia of pregnancy
(D) Thalassaemia minor

392. In hoemochromatosis, the liver is infiltrated with

(A) Copper (B) Iron
(C) Manganese (D) Chromium

393. Which of the following is true? Hypochromic anaemia is not due to iron deficiency except

(A) Serum 'Fe' is high
(B) Normal/low transferrin
(C) Stainable iron in bone marrow
(D) Iron therapy is affective

394. Cytosolic superoxide dismutase contains

(A) Zn only (B) Cu only
(C) Zn and Cu (D) Mn

395. A rise in blood 'Ca' may indicate

(A) Paget's disease (B) Vitamin D deficiency
(C) Cushing's disease (D) Hypervitaminosis D

396. The essential trace element which catalyzes the formation of Hb in the body is

(A) Mn (B) Se
(C) Mg (D) Cu

397. Zinc is a constituent of the enzyme:

(A) Succinate dehydrogenase
(B) Carbonic anhydrase
(C) Mitochondrial superoxide dismutase
(D) Aldolase

398. The active transport of 'Ca' is regulated by _____ which is synthesized in kidnyes.

(A) Cholecalciferol
(B) Ergosterol
(C) 25-OH cholecalciferol
(D) 1, 25-di OH-Cholecalciferol

399. Ceruloplasmin shows the activity

(A) As ferroxidase (B) As reductase
(C) As ligase (D) As transferase

400. The principal cation of extra cellular fluid:

(A) K^+ (B) Na^+
(C) H^+ (D) Ca^{2+}

401. What is the principal cation of intracellular fluid?

(A) K^+ (B) Na^+
(C) Ca^{2+} (D) Mg^{2+}

402. What is the normal level of K^+ in the serum ?

(A) 137–148 mEq/L (B) 120–160 mEq/L
(C) 3.9–5.0 mEq/L (D) 0.3–0.59 mEq/L

403. The general functions of minerals are

(A) The structural components of body tissues
(B) In the regulation of body fluids
(C) In acid-base balance
(D) All of these

404. What are the functions of potassium?

(A) In muscle contraction
(B) Cell membrane function
(C) Enzyme action
(D) All of these

405. The daily requirement of calcium is

(A) 200 mg (B) 400 mg
(C) 800 mg (D) 600 mg

406. The normal serum inorganic phosphorous level is

(A) 1.5–2.5 mg/100 ml
(B) 2.5–4.5 mg/100 ml
(C) 4.5–6.5 mg/100 ml
(D) 0.5–1.5 mg/100 ml

407. When phosphorous level is lowered ?

(A) In hyper thyroidism (B) Cirrosis of liver
(C) Leukemia (D) Hypothyroidism

408. Ferritin is

(A) Coenzyme
(B) One of the component of photophosphorylation
(C) It is the stored form of iron
(D) Non-protein moiety

409. What is ceruloplasmin?

(A) Plasma protein (B) Stored form of copper
(C) Both A and B (D) None of these

410. The following are the functions of copper:

(A) Constituent of cytochromes
(B) Catalase
(C) Tyrosinase
(D) All of these

411. Zn is present as prosthetic group in this enzyme:

(A) Carbonic anhydrase
(B) Carboxy peptidase
(C) Lactate dehydrogenase
(D) All of these

412. Fluorosis is caused due to

(A) Excessive intake of fluorine
(B) Low intake of fluorine
(C) Discoloration of the teeth due to low intake
(D) All of these

413. What is the state of iron in transferrin?

(A) Ferrous form (B) Ferric form
(C) Both A and B (D) None of these

414. Haemoglobin formation needs both

(A) Iron and Zinc (B) Iron and Calcium
(C) Iron and Copper (D) Iron and Magnesium

ANSWERS

1. A	2. C	3. C	4. A	5. B	6. B
7. C	8. B	9. C	10. D	11. C	12. C
13. B	14. A	15. B	16. A	17. B	18. D
19. D	20. A	21. A	22. A	23. C	24. B
25. C	26. C	27. A	28. C	29. C	30. A
31. D	32. A	33. D	34. A	35. B	36. D
37. B	38. C	39. A	40. A	41. B	42. A
43. D	44. A	45. B	46. A	47. A	48. D
49. D	50. A	51. D	52. A	53. A	54. A
55. D	56. B	57. B	58. A	59. C	60. D
61. A	62. D	63. D	64. D	65. B	66. D
67. D	68. D	69. C	70. D	71. A	72. B
73. C	74. D	75. D	76. B	77. A	78. C
79. A	80. D	81. A	82. A	83. C	84. A
85. C	86. D	87. A	88. C	89. D	90. D
91. C	92. B	93. D	94. C	95. B	96. C
97. B	98. A	99. D	100. A	101. C	102. A
103. B	104. B	105. A	106. D	107. C	108. B
109. A	110. D	111. C	112. D	113. A	114. B
115. A	116. A	117. D	118. A	119. D	120. D
121. B	122. A	123. A	124. B	125. A	126. A
127. A	128. C	129. A	130. A	131. B	132. C
133. D	134. C	135. C	136. C	137. A	138. B
139. A	140. B	141. A	142. D	143. C	144. C
145. D	146. D	147. B	148. D	149. C	150. D
151. C	152. C	153. B	154. D	155. A	156. C
157. D	158. B	159. A	160. D	161. C	162. D
163. A	164. C	165. C	166. A	167. A	168. D
169. A	170. D	171. A	172. A	173. A	174. A
175. B	176. A	177. A	178. C	179. A	180. C
181. D	182. B	183. A	184. D	185. C	186. A
187. B	188. C	189. B	190. C	191. C	192. D
193. A	194. D	195. D	196. D	197. A	198. A
199. A	200. C	201. B	202. A	203. D	204. A
205. A	206. B	207. C	208. D	209. B	210. C
211. A	212. C	213. B	214. A	215. B	216. A
217. A	218. A	219. B	220. D	221. A	222. A
223. B	224. D	225. B	226. A	227. C	228. A
229. C	230. A	231. C	232. B	233. C	234. D
235. A	236. C	237. A	238. B	239. A	240. B
241. D	242. B	243. A	244. A	245. A	246. A
247. C	248. A	249. A	250. D	251. D	252. B

253. D	254. C	255. D	256. C	257. C	258. D
259. A	260. B	261. D	262. B	263. C	264. C
265. D	266. C	267. D	268. D	269. A	270. C
271. A	272. D	273. D	274. A	275. C	276. D
277. D	278. D	279. C	280. A	281. D	282. A
283. B	284. B	285. C	286. C	287. C	288. C
289. B	290. C	291. A	292. D	293. D	294. D
295. C	296. C	297. C	298. D	299. B	300. C
301. A	302. C	303. D	304. A	305. D	306. B
307. B	308. D	309. A	310. C	311. C	312. C
313. D	314. C	315. C	316. C	317. D	318. C
319. C	320. D	321. C	322. C	323. B	324. B
325. D	326. D	327. C	328. D	329. C	330. C
331. B	332. B	333. D	334. A	335. B	336. D
337. C	338. D	339. C	340. C	341. C	342. D
343. C	344. D	345. D	346. B	347. C	348. D
349. B	350. C	351. B	352. B	353. B	354. D
355. A	356. C	357. A	358. D	359. D	360. A
361. C	362. D	363. B	364. B	365. C	366. D
367. A	368. C	369. B	370. C	371. B	372. D
373. C	374. C	375. C	376. A	377. C	378. B
379. D	380. B	381. B	382. C	383. D	384. B
385. D	386. A	387. A	388. C	389. C	390. B
391. D	392. B	393. D	394. C	395. D	396. D
397. B	398. D	399. A	400. B	401. A	402. C
403. D	404. D	405. C	406. B	407. A	408. C
409. C	410. D	411. D	412. A	413. B	414. C

CHAPTER 8

HORMONE METABOLISM

1. Hormones

(A) Act as coenzyme
(B) Act as enzyme
(C) Influence synthesis of enzymes
(D) Belong to B-complex group

2. Hormone that binds to intracellular receptor is

(A) Adrenocorticotropic hormone
(B) Thyroxine
(C) Follicle stimulating hormone
(D) Glucagon

3. Hormone that bind to cell surface receptor and require the second messenger camp is

(A) Antidiuretic hormone
(B) Cholecystokinin
(C) Calcitriol
(D) Gastrin

4. A hormone secreted from anterior pituitary is

(A) Growth hormone (B) Vasopressin
(C) Oxytocin (D) Epinephrine

5. A hormone secreted from posterior pituitary is

(A) Vasopressin
(B) Thyrotropic hormone
(C) Prolactin
(D) Adrenocorticotropic hormone

6. The number of amino acids in human growth hormone is

(A) 91 (B) 151
(C) 191 (D) 291

7. Growth hormone causes hyperglycemia. It is a result of

(A) Decreased peripheral utilization of glucose
(B) Decreased hepatic production via gluconeogenesis
(C) Increased glycolysis in muscle
(D) Decrersed lipolysis

8. Acromegaly results due to excessive release of

(A) Thyroxine (B) Growth hormone
(C) Insulin (D) Glucagon

9. Growth hormone is released by

(A) Somatostatin
(B) Growth hormone releasing hormone
(C) Prolactin release inhibiting hormone
(D) Luteinizing releasing hormone

10. The number of amino acids in prolactin is

(A) 134 (B) 146
(C) 172 (D) 199

11. Adrenocorticotropic hormone (ACTH) is a single polypeptide containing

(A) 25 amino acid (B) 39 amino acid
(C) 49 amino acid (D) 52 amino acid

12. Biological activity of ACTH requires

(A) 10-N-terminal amino acid
(B) 24-N-terminal amino acid
(C) 24-C-terminal amino acid
(D) 15-C-terminal amino acid

13. ACTH stimulates the secretion of

(A) Glucocorticoids (B) Epinephrine
(C) Thyroxine (D) Luteinizing hormone

14. Excessive secretion of ACTH causes

(A) Cushing's syndrome
(B) Addison's disease
(C) Myxoedema
(D) Thyrotoxicosis

15. In Cushing's syndrome-a tumour associated disease of adrenal cortex, there is

(A) Decreased epinephrine production
(B) Excessive cortisol production
(C) Excessive epinephrine production
(D) Decreased cortsoil production

16. ACTH induces rise in

(A) Cyclic AMP (B) Cyclic GMP
(C) Calcium (D) Magnesium

17. The circulating concentration of ACTH in plasma is

(A) 0.05 mμ/100 ml
(B) 0.1–2.0 mμ/100 ml
(C) 2.5–3.5 mμ/100 ml
(D) 3.0–5.0 mμ/100 ml

18. Hyperglycemic effect of glucocorticoids is due to

(A) Inactivation of protein phosphatase
(B) Inactivation of fructose 1,6-biphosphatase
(C) Stimulation of synthesis of pyruvate carboxylase
(D) Stimulation of synthesis of eltroxykinase

19. The predominant glucocorticoid is

(A) Cortisol
(B) Aldosterone
(C) Dehydroephiandrosterone
(D) Androstenedione

20. A specific cortisol binding protein, transcortin is a

(A) Albumin (B) α_1-Globulin
(C) α_2-Globulin (D) β-Globulin

21. Cortisol is synthesized in

(A) Zona fasiculata (B) Zona glomerulosa
(C) Zona reticularis (D) Chromaffin cells

22. All mammalian steroid hormones are formed from

(A) Purine (B) Pyrimidine
(C) Cholesterol (D) Pyrrole

23. A very efficient inhibitor of steroid biosynthesis is

(A) Aminoglutethimide
(B) Aminoimidazole
(C) Aminoimidazolesuccinyl carboxamine
(D) Aminopterin

24. In adrenal gland the cholesterol is stored

(A) Mostly in the free form
(B) Mostly in esterified form
(C) Large amount of free form and less amount of esterified form
(D) Equal amounts of free and esterified form

25. Aldosterone synthesis occurs in

(A) Zona reticularis (B) Zona fasciculata
(C) Zona glomerulosa (D) Chromaffian cells

26. In the biosynthesis of cortiol, the sequence of enzymes involved is

(A) Hydroxylase–dehydrogenase + isomerase – hydroxylase
(B) Dehydrogenase–hydroxylase–isomerase
(C) Hydroxylase–lyase–dehydrogenase isomerase
(D) Isomerase–lyase–hydroxylase–dehydrogenase

27. The defect in adrenal cortex responsible for lack of glucocorticoids and mineralcorticoids is

(A) Androstenedione deficiency
(B) 17α-OH progesterone deficiency
(C) C-21 hydroxylase deficiency
(D) Testosterone deficiency

28. 3-β-Hydroxysteroid dehydrogenase and $\Delta^{5,4}$ isomerase catalyse the conversion of the weak androgen DHEA to

(A) Androstenedione (B) Testosterone
(C) Progesterone (D) Estrone

29. In the resting state plasma concentration of cortisol is

(A) 0.4–2.0 μg/100 ml
(B) 2.0–4.0 μg/100 ml
(C) 5.0–15.0 μg/100 ml
(D) 18.0–25.0 μg/100 ml

30. The most important effect of aldosterone is to

(A) Increase the rate of tubular reabsorption of sodium
(B) Decrease the rate of tubular reabsorption of potassium
(C) Decrease the reabsorption of chloride
(D) Decrease the renal reabsorption of sodium

31. One of the potent stimulators of aldosterone secretion is

(A) Increased sodium concentration
(B) Decreased potassium concentration
(C) Increased potassium concentration
(D) Increased ECF volume

32. In the rennin-angiotensin system the primary hormone is

(A) Angiotensinogen (B) Angiotensin I
(C) Angiotensin II (D) Angiotensin III

33. Aldosterone release is stimulated by

(A) α_2-Globulin (B) Renin
(C) Angiotensin II (D) Growth hormone

34. In the synthesis of Angiotensin I, rennin acts on Angiotensinogen and cleaves the

(A) Leucine – leucine at 10 and 11 position
(B) Valine – tyrosine at 3 and 4 position
(C) Isoleucine – histidine at 5 and 6 position
(D) Proline – histidine at 7 and 8 position

35. Catecholamine hormones are synthesized in the

(A) Chromaffin cells of adrenal medulla
(B) Zona glomerulosa of adrenal cortex
(C) Zona fasciculate of adrenal cortex
(D) Zona reticularis of adrenal cortex

36. Catecholamine hormones are

(A) 3, 4-Dihydroxy derivatives of phenylethylamine
(B) p-Hydroxy derivatives of phenylacetate
(C) p-Hydroxy derivatives of phenylpyruvate
(D) p-Hydroxy derivatives of phenyllactate

37. The sequential steps in the conversion of tyrosine to epinephrine are

(A) Ring hydroxylation-decarboxylation-side chain hydroxylation-N-methylation
(B) Side chain hydroxylation-decarboxylation-ring hydroxylation N-methylation
(C) Decarboxylation-ring hydroxylation-side chain hydroxylation-N-methylation
(D) N-methylation-decarboxylation-ring and side chain hydroxylation

38. The hormone required for uterine muscle contraction for child birth is

(A) Progesterone (B) Estrogen
(C) Oxytocin (D) Vasopressin

39. The number of amino acids in the hormone oxytocin is

(A) 7 (B) 9
(C) 14 (D) 18

40. Vasopressin and oxytocin circulate unbound to proteins and have very short plasma half lives, on the order of

(A) 1–2 minutes (B) 2–4 minutes
(C) 5–8 minutes (D) 10–12 minutes

41. Melanogenesis is stimulated by

(A) MSH (B) FSH
(C) LH (D) HCG

42. The number of amino acids in antidiuretic hormone is

(A) 9 (B) 18
(C) 27 (D) 36

43. ADH

(A) Reabsorbs water from renal tubules
(B) Excretes water from renal tubules
(C) Excretes hypotonic urine
(D) Causes low specific gravity of urine

44. Increased reabsorption of water from the kidney is the major consequence of the secretion of the hormone?

(A) Cortisol (B) Insulin
(C) Vasopressin (D) Aldosterone

45. An increase in the osmolality of extracellular compartment will

(A) Inhibit ADH secretion
(B) Stimulate ADH secretion
(C) Cause no change in ADH secretion
(D) Stimulate the volume and osmoreceptor and inhibit ADH secretion

46. For Catecholamine biosynthesis the rate limiting enzyme is

(A) DOPA decarboxylase
(B) DOPAMINE β-hydroxylase
(C) Tyrosine hydroxylase
(D) Phenylalanine hydroxylase

47. A hormone which cannot cross the blood brain barrier is

(A) Epinephrine (B) Aldosterone
(C) ACTH (D) TSH

48. The plasma level of epinephrine is less than

(A) 0.1 ng/ml (B) 0.2 ng/ml
(C) 0.4 ng/ml (D) 0.8 ng/ml

49. Epinephrine is rapidly metabolized by

(A) Monoamine oxidase
(B) Deaminase
(C) Transminase
(D) Decarboxylase

50. Pheochromocytomas are tumours of

(A) Adrenal cortex (B) Adrenal medulla
(C) Pancreas (D) Bone

51. A characteristic of pheochromocytoma is elevated urinary excretion of

(A) Dopamine
(B) Tyrosine
(C) Vinylmandelic acid
(D) Phenylalanine

52. In the synthetic pathway of epinephrine, disulfiram (antabuse) inhibits the enzyme:

(A) Tyrosine hydroxylase
(B) Dopamine β-hydroxylase
(C) DOPA decarboxylase
(D) N-methyl transferase

53. The biosynthesis of both Catecholamine and serotonin require

(A) Tyrosine hydroxylase
(B) N-methyl transferase
(C) Aromatic amino acid decarboxylase
(D) Tryptophan pyrrolase

54. Epinephrine stimulates glycogenolysis in

(A) Liver (B) Muscle
(C) Liver and muscle (D) Kidney

55. A cup of strong coffee would be expected to

(A) Interfere with the synthesis of prostaglandins
(B) Decrease the effect of glucagon
(C) Enhance the effect of epinephrine
(D) Provide the vitamin nicotinic acid

56. Epinephrine is derived from norepinephrine by

(A) Decarboxylation (B) Hydroxylation
(C) Oxidation (D) N-methylation

57. 5 HIAA test is negative if patient is taking

(A) Aspirin (B) Colchicine
(C) Phenothiazone (D) Methotrexate

58. Presence of significant amount of 5-HIAA in urine indicates

(A) Carcinoid in liver
(B) Carcinoid in appendix
(C) Metastasis of carcinoma of liver
(D) Hepatoma

59. The normal serum level of triiodothyronine (T_3) is

(A) 0.2–0.5 ng/ml (B) 0.7–2.0 ng/ml
(C) 2.0–4.0 ng/ml (D) 5.0–8.0 ng/ml

60. The normal serum level of thyroxine (T_4) is

(A) 2.0–4.0 μg/100 ml
(B) 5.5–13.5 μg/100 ml
(C) 14.0–20.3 μg/100 ml
(D) 20.0–25.0 μg/100 ml

61. Excess secretion of thyroid hormones causes

(A) Hyperthyroidism (B) Myxoedema
(C) Cretinism (D) Cushing syndrome

62. Insufficient free T_3 and T_4 results in

(A) Grave's disease (B) Mysoedema
(C) Cushing syndrome (D) Gigantism

63. In primary hypothyroidism the useful estimation is of

(A) T_3 (B) T_4
(C) TBG (D) Autoantibodies

64. When iodine supplies are sufficient the T_3 and T_4 ratio in thyroglobulin is

(A) 1 : 2 (B) 1 : 4
(C) 1 : 7 (D) 1 : 10

65. A substance which competes with iodide uptake mechanism by thyroid gland is

(A) Thiocynate (B) Iodoacetate
(C) Fluoride (D) Fluoroacetate

66. Thyroperoxidase enzyme contains

(A) Heme (B) Copper
(C) Zinc (D) Magnesium

67. Thyroproxidase requires hydrogen peroxide as oxidizing agent. The H_2O_2 is produced by

(A) $FADH_2$ dependent enzyme
(B) NADH dependent enzyme
(C) NADP dependent enzyme
(D) NADPH dependent enzyme

68. Thyroid stimulating hormone is a dimer. The α-subunits of TSH, LH, FSH are identical. Thus the biological specificity must therefore be β subunit in which the number of amino acids is

(A) 78 (B) 112
(C) 130 (D) 199

69. TSH stimulates the synthesis delete

(A) Thyroxine (B) Adrenocorticoids
(C) Epinephrine (D) Insulin

70. Thyroid hormones are synthesized by the iodination of the amino acid:

(A) Glycine (B) Phenylalanine
(C) Alanine (D) Tyrosine

71. The tyrosine residues per molecule of thyroglobulin is

(A) 85 (B) 95
(C) 115 (D) 135

72. The percentage of inactive precursors (monoidotyrosine and diiodotyrosine) in thyroglobulin is

(A) 30 (B) 40
(C) 50 (D) 70

73. The number of amino acids in parathormone is

(A) 65 (B) 84
(C) 115 (D) 122

74. The sequence of amino acid in which the biological value of parathormone is

(A) 1–15 (B) 1–34
(C) 30–50 (D) 50–84

75. PTH

(A) Reduces the renal clearance or excretion of calcium
(B) Increases renal phosphate clearance
(C) Increases the renal clearance of calcium
(D) Decreases the renal phosphate clearance

76. The number of amino acids in the peptide hormone calcitonin is

(A) 16 (B) 24
(C) 32 (D) 40

77. Calcitonin causes

(A) Calcinuria and phosphaturia
(B) Decrease in urinary calcium
(C) Decrease in urinary phosphorous
(D) Increase in blood calcium level

78. The characteristic of hyperparathyroidism is

(A) Low serum calcium
(B) High serum phosphorous
(C) Low serum calcium and high serum phosphorous
(D) High serum calcium and low serum phosphate

79. Parathyroid hormone

(A) Is released when serum Ca^{++} is too high
(B) Inactivates vitamin D
(C) Is secreted when Ca^{++} is too low
(D) Depends on vitamin K for adequate activity

80. δ-Cells of islet of langerhans of pancreas produce

(A) Pancreatic polypeptide
(B) Pancreatic lipase
(C) Somatostatin
(D) Steapsin

81. β-cells of islet of langerhans of the pancreas secrete

(A) Insulin
(B) Glucagon
(C) Somatostatin
(D) Pancreatic polypeptide

82. Target tissue of insulin is

(A) Red blood cells
(B) Renal tubular cells
(C) GI tract epithelial cells
(D) Liver

83. Insulin is a dimmer. The number of amino acids in the A and B chain respectively is

(A) 19 and 28 (B) 21 and 30
(C) 25 and 35 (D) 29 and 38

84. In A chain of the insulin molecule the N-terminal amino acid is

(A) Glycine (B) Valine
(C) Serine (D) Phenylalanine

85. In the A chain of insulin molecule the C-terminal amino acid is

(A) Asparagine (B) Threonine
(C) Valine (D) Tyrosine

86. In the B chain of insulin molecule, the N-terminal amino acid is

(A) Proline (B) Threonine
(C) Phenylalanine (D) Lysine

87. In the B chain of insulin molecule, the C-terminal amino acid:

(A) Threonine (B) Tyrosine
(C) Glutamate (D) Valine

88. In the insulin molecule, the number of interchain disulphide brides is

(A) 1 (B) 2
(C) 3 (D) 4

89. In the insulin molecule, the number of intrachain disulphide bridges is

(A) 1 (B) 2
(C) 3 (D) 4

90. Insulin exists in polymeric forms, for polymerization it requires

(A) Calcium (B) Magnesium
(C) Manganese (D) Zinc

91. The number of amino acids in pre-pro insulin is

(A) 51 (B) 86
(C) 109 (D) 132

92. Proinsulin has

(A) 74 amino acids (B) 86 amino acids
(C) 105 amino acids (D) 109 amino acids

93. Daily secretion of insulin in a normal adult man is about

(A) 10 units (B) 20 units
(C) 30 units (D) 50 units

94. The insulin content of pancreas is about

(A) 50–70 units (B) 100–150 units
(C) 150–180 units (D) 200–250 units

95. The half life of insulin is

(A) < 3–5 minutes (B) < 8–10 minutes
(C) < 15 minutes (D) < 15 minutes

96. Insulin stimulates

(A) Hepatic glycogenolysis
(B) Hepatic glycogenesis
(C) Lipolysis
(D) Gluconeogenesis

97. Action of insulin on lipid metabolism is

(A) It increases lipolysis and increases triglyceride synthesis
(B) It decreases lipolysis and increases triglyceride synthesis
(C) It decreases lipolysis and decreases triglyceride synthesis
(D) It increases synthesis of triglyceride and increased ketogenesis

98. Insulin increases the activity of

(A) Pyruvate kinase
(B) Phosphorylase
(C) Triacylglycerol kinase
(D) Fructose 2, 6-bisphosphatase

99. Insulin decreases the activity of

(A) cAMP dependent protein kinase
(B) HMG CoA-reductas
(C) Phosphodiesterase
(D) Acetyl CoA-carboxylase

100. The human insulin gene located on the short arm of chromosome:

(A) 11 (B) 17
(C) 18 (D) 20

101. Normal serum insulin level varies between

(A) 4–25 μU/ml (B) 25–50 μU/ml
(C) 70–90 μU/ml (D) 100–120 μU /ml

102. Following is a normal overnight fast and a cup of black coffee, a diabetic woman feels slightly nausious and decides to skip breakfast. However she does take her shot of insulin. This may result in

(A) Heightened glycogenolysis
(B) Hypoglycemia
(C) Increased lipolysis
(D) Glycosuria

103. Deficiency of insulin results in

(A) Rapid uptake of sugar
(B) Low blood glucose level
(C) Decrease urine output
(D) Presence of glucose in urine

104. The primary stimulus for insulin secretion is increased.

(A) Blood level of epinephrine
(B) Blood level of glucagon
(C) Blood level of glucose
(D) Water intake

105. The α-cells of pancreas islets produce

(A) Insulin
(B) Glucagon
(C) Somatostatin
(D) Pancreatic polypeptide

106. The number of amino acids in single chain polypeptide glucagons is

(A) 21 (B) 29
(C) 31 (D) 39

107. The half life of glucagons is

(A) ~5 (B) ~7
(C) ~10 (D) ~12

108. Glucagon enhances

(A) Hepatic glycogenolysis
(B) Muscle glycogenolysis
(C) Hepatic glycogenesis
(D) Lipogenesis

109. Normal serum glucagons level in fasting state varies between

(A) 0—10 pg/ml (B) 20–100 pg/ml
(C) 200–300 pg/ml (D) 400–500 pg/ml

110. Glucagon

(A) Increases protein synthesis
(B) Inhibits lipolysis in adipocytes
(C) Increases gluconeogenesis in liver
(D) Stimulates muscle glycogenolysis

111. Normal serum free testosterone in adult men varies between

(A) 1–5 ng/dl (B) 6–9 ng/dl
(C) 10–30 ng/dl (D) 50–100 ng/dl

112. Normal serum free testosterone in adult women varies between

(A) 0.0–0.2 ng/dl (B) 0.3–2 ng/dl
(C) 10–30 ng/dl (D) 50–100 ng/dl

113. The prepubertal total serum testosterone is

(A) <100 ng/100 ml (B) < 200 ng/100 ml
(C) <300 ng/100 ml (D) < 400 ng/100 ml

114. The total serum testosterone in adult men is

(A) 50–100 ng/100 ml
(B) 150–250 ng/100 ml
(C) 300–1000 ng/100 ml
(D) 1000–3000 ng/100 ml

115. The total serum testosterone in adult women is

(A) 0–5 ng/100 ml
(B) 10–15 ng/100 ml
(C) 20–80 ng/100 ml
(D) 100–200 ng/100 ml

116. The serum estradiol level in men is

(A) 0–5 pg/ml (B) 5–10 pg/ml
(C) 24–68 pg/ml (D) 40–60 pg/ml

117. The serum estradiol level in women during 1–10 days of menstrual cycle is

(A) 0–10 pg/ml (B) 12–20 pg/ml
(C) 24–68 pg/ml (D) 80–100 pg/ml

118. The serum estradiol level in women during 11–20 days of menstrual cycle is

(A) 5–30 pg/ml (B) 50–300 pg/ml
(C) 500–900 pg/ml (D) 1000 pg/ml

119. The serum estradiol level in women during 21–30 days of menstrual cycle is

(A) 10-20 pg/ml (B) 22-66 pg/ml
(C) 73-149 pg/ml (D) 1000 pg/ml

120. The serum progesterone level in follicular phase is about

(A) 0.2–1.5 ng/100 ml
(B) 2.0–2.5 ng/100 ml
(C) 3.5–4.5 ng/100 ml
(D) 5.0–6.5 ng/100 ml

121. Serum progesterone level during pregnancy is

(A) < 12 ng/ml (B) > 12 ng/ml
(C) < 20 ng/ml (D) >24 ng/ml

122. Serum progesterone level during luteal phase is

(A) 0.2–203 ng/ml (B) 3.0–5.0 ng/ml
(C) 6.0–30 ng/ml (D) 750 ng/ml

123. Androgens are produced by

(A) Cells of sertoli
(B) Leydig cells
(C) Rete testis
(D) Efferent ductules

124. The leyding cell activity is controlled by

(A) Intestitial cell stimulating hormone
(B) Adernocortex stimulating hormone
(C) Thyroid stimulating hormone
(D) Melanocyte stimulating harmone

125. Stein-leventhal syndrome is due to overproduction of

(A) Estrogens (B) Androgens
(C) Gastogens (D) Ethinyl estradiol

126. The production of progesterone by corpus luteum cell is stimulated by

(A) LH (B) TSH
(C) ACTH (D) MSH

127. In the biosynthesis of testosterone the rate limiting step is conversion of

(A) Cholesterol to pregnenolone
(B) Pregnenolone to progesterone
(C) Progesterone to 17 α-hydroxy progesterone
(D) 17 α-Hydroxy progesterone to androstenedione

128. The enzyme catalyzing conversion of androstenedione to testosterone is a

(A) Oxygenase (B) Dehydrogenase
(C) Isomerase (D) Decarboxylase

129. Conversion of testosterone to estradiol requires the enzyme:

(A) Aromatase (B) Dehydrogenase
(C) Lyase (D) Isomerase

130. The precursor of testosterone is

(A) Aldosterone (B) Methyl testosterone
(C) Estrone (D) Pregnenolone

131. Urinary 17 ketosteroids

(A) Are not found in women
(B) Reflect the total production of androgenic substances
(C) Indicate the total production of sex hormone
(D) Are highly active androgens

132. The hormone measured in urine to test pregnancy is

(A) Anterior pituitary luteinizing hormone
(B) Androgen
(C) Progesterone
(D) Choroinic gonadotropin

133. Total number of amino acids in human chorionic gonadotropin is

(A) 53 (B) 92
(C) 145 (D) 237

134. A hormone produced by corpus luteum and placenta, concerned with relaxation of pelvis tissue is

(A) HCG
(B) Chorionic somatommotropin
(C) Relaxin
(D) Progestins

135. Synthetic progesterone used in oral contraceptive is

(A) Norethindrone (B) Pregnenolone
(C) Androstenodione (D) Stilbestrol

136. Young women are protected against myocardial infaracation because of the activity of

(A) Estrogen (B) Progesterone
(C) Growth hormone (D) Oxytocin

137. Hormone receptors possess all the following properties except

(A) All of them are proteins
(B) They possess a recognition domain
(C) They bind hormones with a high degree of specificity
(D) Number of receptors in a target cell is constant

138. The only correct statement about hormone receptors is

(A) Receptors for protein hormones are present in cytosol
(B) Receptors for steroid hormones are membrane bound
(C) Hormone-receptor binding is irreversible
(D) Receptors can undergo down regulation and up regulatoin

139. Down regulation is

(A) Increased destruction of a hormone
(B) Feed back inhibition of hormone secretion
(C) Decreased concentration of a hormone in blood
(D) Decrease in number of receptors for a hormone

140. All the following statements about hormones are true except

(A) All of them require specific carriers in plasma
(B) All of them require specific receptors in target cells
(C) Some of them are subject to feedback regulation
(D) Some of them increase the transcription of certain genes

141. All the following statements about steroid hormones are true except

(A) They are hydrophobic
(B) They require carriers to transport them in circulation
(C) Their receptors are intracellular
(D) They require cyclic AMP as second messenger

142. Cyclic AMP acts as the second messenger for

(A) ADH (B) Glucagon
(C) Calcitonin (D) All of these

143. Cyclic AMP acts as the second messenger for all of the following except

(A) Oxytocin (B) TSH
(C) ACTH (D) FSH

144. Cyclic GMP acts as the second messenger for

(A) Nerve growth factor
(B) Atrial natriuretic factor
(C) Epinephrine
(D) Norepinephrine

145. Some hormones produce their intracellular effects by activating

(A) Phospholipae A_1 (B) Phospholipase B
(C) Phospholipase C (D) All of these

146. Inositol triphosphate is the second messenger for

(A) Gastrin (B) Cholecystokinin
(C) Oxytocin (D) All of these

147. G-proteins act as

(A) Hormone carriers
(B) Hormone receptors
(C) Second messengers
(D) Signal transducers

148. Signal transducer for glucagons is a

(A) Cyclic nucleotide
(B) Phosphoinositide
(C) Stimulatory G-protein
(D) Inhibitory G-protein

149. G-proteins are

(A) Monomers (B) Dimers
(C) Trimers (D) Tetramers

150. G-proteins have a nucleotide binding site for

(A) ADP/ATP (B) GDP/GTP
(C) CDP/CTP (D) UDP/UTP

151. The nucleotide binding site of G-proteins is present on their

(A) α-Subunit (B) β-Subunit α- and β-
(C) γ-Subunit (D) δ-Subunit

152. Adenylate cyclase is activated by

(A) GDP-bearing α-Subunit of G-protein
(B) GTP-bearing α-Subunit of G-protein
(C) GDP-bearing γ-Subunit of G-protein
(D) GTP-bearing γ-Subunit of G-protein

153. Tyrosine kinase activity is present in

(A) α-Adrenergic receptors
(B) β-Adrenergic receptors
(C) Cholinergic receptors
(D) Insulin receptors

154. Insulin receptor is a

(A) Monomer (B) Dimer
(C) Trimer (D) Tetramer

155. Tyrosine kinase activity is present in

(A) Acetylcholine receptor
(B) PDGF receptor
(C) ADH receptor
(D) All of these

156. Protein kinase C is activated by

(A) Cyclic AMP (B) Cyclic GMP
(C) Diacyl glycerol (D) Inositol triphosphate

157. Melatonin is synthesised in

(A) Hypothalamus
(B) Posterior pituitary gland
(C) Pineal gland
(D) Melanocytes

158. Melatonin is synthesised from

(A) Phenylalanine (B) Tyrosine
(C) Tryptophan (D) None of these

159. Melanocyte stimulating hormone is secreted by

(A) Pineal gland
(B) Anterior lobe of pituitary gland
(C) Posterior lobe of pituitary gland
(D) Intermediate lobe of pituitary gland

160. MSH causes

(A) Dispersal of melanin granules in melanocytes
(B) Increase in melanin concentration in melanocytes
(C) Decerease in melanin concentration in melanocytes
(D) Increase in number of melanocytes

161. Secretion of MSH is regulated by

(A) Feedback mechanism
(B) Melatonin
(C) Hypothalamic hormones
(D) ACTH

162. A hormone synthesised in the hypothalamus is

(A) Melatonin
(B) Melanocyte stimulating hormone
(C) Vasopressin
(D) Prolactin

163. Posterior pituitary gland secretes

(A) Catecholamines
(B) Oxytocin
(C) Follicle stimulating hormone
(D) Serotonin

164. A nonapeptide among the following is

(A) Antidiuretic hormone
(B) Insulin
(C) ACTH
(D) Thyrotropin releasing hormone

165. Diabetes insipidus is caused by deficient secretion of

(A) Insulin (B) Glucagon
(C) Vasopressin (D) Oxytocin

166. Peripheral vasoconstriction is caused by high concentrations of

(A) Antidiuretic hormone
(B) Melatonin
(C) Glucagon
(D) Oxytocin

167. Somatotropin is secreted by

(A) Hypothalamus (B) Anterior pituitary
(C) Posterior pituitary (D) Thyroid gland

168. Secretion of Insulin-like Growth Factor-I is promoted by

(A) Insulin (B) Glucagon
(C) Growth hormone (D) Somatomedin C

169. Growth hormone increases

(A) Protein synthesis (B) Lipogenesis
(C) Glycogenolysis (D) All of these

170. Secretion of growth hormone is inhibited by

(A) Somatomedin C (B) Somatostatin
(C) Feedback inhibition (D) All of these

171. Secretion of somatotrophin is promoted by

(A) Somatomedin C
(B) Somatostatin
(C) Growth hormone releasing hormone
(D) Hypoglycaemia

172. Human growth hormone has

(A) One polypeptide chain and one intra-chain disulphide bond
(B) One polypeptide chain and two intra-chain disulphide bond
(C) Two polypeptide chains joined by one disulphide bond
(D) Two polypeptide chains joined by two disulphide bond

173. Number of amino acid residues in human growth hormone is

(A) 51 (B) 84
(C) 191 (D) 198

174. Number of amino acid residues in prolactin is

(A) 51 (B) 84
(C) 191 (D) 198

175. Secretion of prolactin is regulated by

(A) Feedback inhibition
(B) Prolactin releasing hormone
(C) Prolactin release inhibiting hormone
(D) All of these

176. Precursor of ACTH is

(A) Cholesterol (B) Pregnenolone
(C) Corticotropin (D) Pro-opiomelanocortin

177. All of the following can be formed from pro-opiomelanocortin except

(A) α-and β-MSH (B) β-and γ-Lipotropins
(C) α-and β-Endorphins (D) FSH

178. All the following statements about pro-opiomelanocortin are true except

(A) It is made up of 285 amino acids
(B) It is synthesised in pars intermedia and anterior lobe of pituitary gland
(C) It is the precursor of ACTH and melatonin
(D) It is the precursor of corticotropin like intermediate lobe peptide and endorphins

179. All the following statements about ACTH are true except

(A) It is a tropic hormone
(B) Its target cells are located in adrenal cortex
(C) Its receptors are located in the cell membrane
(D) Its second messenger is inositol triphosphate

180. Regulation of ACTH secretion occurs through

(A) Corticotropin releasing hormone (CRH) and corticotropin release inhibiting hormone (CRIH) of hypothalamus
(B) Feedback inhibition by cortisol
(C) CRH and feedback inhibition by cortisol
(D) CRIH and feedback inhibition by cortisol

181. ACTH is a polypeptide made up of

(A) 39 amino acids (B) 41 amino acids
(C) 51 amino acids (D) 84 amino acids

182. CRH is a polypeptide made up of

(A) 39 amino acids (B) 41 amino acids
(C) 51 amino acids (D) 84 amino acids

183. Hormonal activity of ACTH is completely lost on removal of

(A) 5 C-terminal amino acids
(B) 10 C-terminal amino acids
(C) 15 C-terminal amino acids
(D) None of these

184. All the following statements about TSH are true except

(A) It is a glycoprotein
(B) It is made up of α- and β-subunits
(C) Receptor recognition involves both the subunits
(D) Its subunit is identical with those of FSH and LH

185. All the following statements about TSH are true except

(A) It is a tropic hormone
(B) It acts on para-follicular cells of thyroid glands
(C) Its receptors are membrane-bound
(D) Its second messenger is cyclic AMP

186. All the following statements about thyrotropin releasing hormone are true except

(A) It is secreted by hypothalamus
(B) It is a pentapeptide
(C) It increases the secretion of TSH
(D) Its secretion is inhibited by high level of T_3 and T_4 in blood

187. In males, luteinising hormone acts on

(A) Leydig cells (B) Sertoli cells
(C) Prostate gland (D) All of these

188. All the following statements about FSH are true except

(A) It is a tropic hormone secreted by anterior pituitary
(B) Its secretion is increased by gonadotropin releasing hormone
(C) It acts on Sertoli cells
(D) It increases the synthesis of testosterone

189. In males, secretion of luteinising hormone is inhibited by

(A) Gonadotropin releasing hormone
(B) FSH
(C) High blood level of testosterone
(D) Inhibin

190. Secretion of luteinising hormone is increased by

(A) GnRH (B) FSH
(C) Testosterone (D) None of these

191. In structure and function, HCG resembles

(A) FSH (B) LH
(C) GnRH (D) Progesterone

192. Acromegaly results from overproduction of

(A) ACTH during childhood
(B) TSH during adult life
(C) Growth hormone during childhood
(D) Growth hormone during adult life

193. Acromegaly results in all the following except

(A) Overgrowth of the bones of face, hands and feet
(B) Increased stature
(C) Enlargements of viscera
(D) Impaired glucose tolerance

194. Overproduction of growth hormone during childhood causes

(A) Acromegaly (B) Gigantism
(C) Cushing's disease (D) Simmond's disease

195. Decreased secretion of growth hormone during childhood causes

(A) Simmond's disease (B) Cushing's disease
(C) Dwarfism (D) Cretinism

196. Stature is increased in

(A) Gigantism (B) Acromegaly
(C) Simmond's disease (D) Cushing's disease

197. An amino acid used for the synthesis of thyroid hormone is

(A) Tyrosine (B) Tryptophan
(C) Histidine (D) Proline

198. An enzyme required for the synthesis of thyroid hormones is

(A) Iodinase (B) Deiodinase
(C) Thyroperoxidase (D) Thyroxine synthetase

199. Thyroperoxidase iodinates

(A) Free tyrosine in thyroid gland
(B) Tyrosine residues of thyroglobulin
(C) Tyrosine residues of thyroxine binding globulin
(D) Tyrosine residues of thyroxine binding prealbumin

200. In thyroxine, tyrosine residues are iodinated at positions:

(A) 1 and 3 (B) 2 and 4
(C) 3 and 5 (D) 4 and 6

201. Thyroid gland takes up circulating iodine

(A) By simple diffusion
(B) By facilitated diffusion
(C) By active uptake
(D) In exchange for chloride

202. Thyroid hormones are present in blood

(A) In free form
(B) In association with thyroxine binding globulin (TBG)
(C) In association with thyroxine binding pre-albumin (TBPA)
(D) Mainly in association with TBG, partly in free form and sometimes in association with TBPA also

203. When thyroxine binding globulin and thyroxine binding pre-albumin are saturated with thyroxine, the excess hormone is transported by

(A) Albumin (B) Gamma globulins
(C) Transcortin (D) None of these

204. Receptors for thyroid hormones are present

(A) On the cell membrane
(B) Across the cell membrane
(C) Inside the cells
(D) In association with G-proteins

205. Binding of thyroxine to its receptors

(A) Activates Adenylate cyclase
(B) Activates guanylate cyclase
(C) Activates a stimulatory G-protein
(D) Increases transcription

206. The most powerful thyroid hormone is

(A) Reverse T_3 (B) DIT
(C) T_3 (D) T_4

207. The most abundant thyroid hormone in blood is

(A) Free T_3 (B) T_3 bound to TBG
(C) Free T_4 (D) T_4 bound to TBG

208. Secretion of thyroid hormones is regulated by

(A) Hypothalamus
(B) Anterior pituitary
(C) Feedback regulation
(D) All of these

209. Clinical features of hyperthyroidism include

(A) Goitre, heat intolerance, weight loss and tachycardia
(B) Goitre, tremors, tachycardia and cold intolerance
(C) Exophthalmos, goiter, tachycardia and loss of appetite
(D) Exophthalmos, goiter, tremors and obesity

210. All the following may occur in hyperthyroidism except

(A) Goitre (B) Increased appetite
(C) Loss of weight (D) Low BMR

211. All the following may occur in myxoedema except

(A) Cold intolerance (B) Low BMR
(C) Tachycardia (D) Dry and coarse skin

212. Mental retardation can occur in

(A) Cretinism
(B) Juvenile myxoedema
(C) Myxoedema
(D) Juvenile thyrotoxicosis

213. Parathyroid hormone (PTH) is synthesised in

(A) Chief cells of parathyroid glands
(B) Oxyphil cells of parathyroid glands
(C) Para follicular cells of thyroid glands
(D) Follicular cells of thyroid gland

214. The number of amino acid residues in PTH:

(A) 51 (B) 84
(C) 90 (D) 115

215. Amino acid residues which are essential for the biological activity of PTH are

(A) N-terminal 34 amino acids
(B) N-terminal 50 amino acids
(C) C-terminal 34 amino acids
(D) C-terminal 50 amino acids

216. Half-life of PTH is

(A) A few seconds (B) A few minutes
(C) A few hours (D) A few days

217. The second messenger for PTH is

(A) Cyclic AMP (B) Cyclic GMP
(C) Diacylglycerol (D) Inositol triphosphate

218. PTH causes all of the following except

(A) Increased intestinal absorption of calcium
(B) Increased intestinal absorption of phosphate
(C) Increased tubular reabsorption of calcium
(D) Increased tubular reabsorption of phosphate

219. Secretion of PTH is regulated by

(A) Hypothalamus
(B) Anterior pituitary
(C) Feedback effect of plasma PTH
(D) Feedback effect of plasma calcium

220. A high concentration of PTH in blood causes

(A) Increase in plasma calcium and inorganic phosphorous
(B) Decrease in plasma calcium and inorganic phosphorous
(C) Increase in plasma calcium and decrease in plasma inorganic phosphorous
(D) Decrease in plasma calcium and increase in plasma inorganic phosphorous

221. Tetany can occur

(A) In primary hyperparathyroidism
(B) In secondary hyperparathyroidism
(C) In idiopathic hypoparathyroidism
(D) After accidental removal of parathyroid glands

222. Crystallisation of insulin occurs in the presence of

(A) Chromium (B) Copper
(C) Zinc (D) Calcium

223. Daily secretion of insulin is about δ–

(A) 10–20 mg (B) 40–50 mg
(C) 10–20 units (D) 40–50 units

224. Insulin receptors are decreased in number in

(A) Obesity (B) Starvation
(C) Hyperinsulinism (D) Kwashiorkor

225. Insulin binding sites are present on the

(A) α-subunits of insulin receptor
(B) β-subunits of insulin receptor
(C) γ-subunits of insulin receptor
(D) α-and β–subunits of insulin receptor

226. α-Subunits of insulin receptor are present

(A) Outside the cell membrane
(B) In the cell membrane
(C) Across the cell membrane
(D) In the cytosol

227. β-Subunits of insulin receptor are present

(A) Outside the cell membrane
(B) In the cell membrane
(C) Across the cell membrane
(D) In the cytosol

228. In the insulin receptor, tyrosine kinase domain is present in

(A) α-Subunits (B) β-Subunits
(C) γ-Subunits (D) δ-Subunits

229. Binding of insulin to its receptor activates

(A) Adenylate cyclase (B) Guanylate cyclase
(C) Phospholipase C (D) Tyrosine kinase

230. Insulin receptor is made up of

(A) One α-and one β-subunit
(B) Two α-and two β-subunit
(C) Two, α two β-and two γ-subunit
(D) One α, one β-one γ-and one δ-subunit

231. Insulin is required for the active uptake of glucose by most of the cells except

(A) Muscle cells (B) Renal tubular cells
(C) Adipocytes (D) Liver cells

232. Insulin decreases

(A) Glycogenesis
(B) Glyolysis
(C) Gluconeogenesis
(D) Tubular reabsorption of glucose

233. Insulin increases

(A) Glycogenesis (B) Gluconeogenesis
(C) Lipolysis (D) Blood glucose

234. Insulin increases

(A) Protein synthesis (B) Fatty acid synthesis
(C) Glycogen synthesis (D) All of these

235. Insulin decreases the synthesis of

(A) Hexokinase (B) Glucokinase
(C) PEP carboxykinase (D) Glycogen synthetase

236. Diabetes mellitus can occur due to all of the following except

(A) Deficient insulin secretion
(B) Tumour of β–cells
(C) Decrease in number of insulin receptors
(D) Formation of insulin antibodies

237. Hypoglycaemic coma can occur

(A) In untreated diabetes mellitus
(B) In starvation
(C) After overdose of oral hypoglycaemic drugs
(D) After overdose of insulin

238. Second messenger for glucagons is

(A) Cyclic AMP (B) Diacylglycerol
(C) Cyclic GMP (D) Inositol triphosphate

239. Number of amino acid residues in glucagons is

(A) 29 (B) 34
(C) 51 (D) 84

240. Glucagon secretion increases

(A) After a carbohydrate-rich meal
(B) After a fat-rich meal
(C) When blood glucose is high
(D) When blood glucose is low

241. The maineffecting of glucagons is to increase

(A) Glycolysis in muscles
(B) Glycogenolysis in muscles
(C) Glycogenolysis in liver
(D) Glycogenesis in liver

242. Tyrosine is required for the synthesis of all of the following except

(A) Melatonin (B) Epinephrine
(C) Norepinephrine (D) Thyroxine

243. Dopamine is synthesised from

(A) Dihydroxyphenylalanine
(B) Epinephrine
(C) Norepinephrine
(D) Metanephrine

244. Blood brain barrier can be crossed by

(A) Epinephrine (B) Dopamine
(C) Dopa (D) All of these

245. Epinephrine is synthesised in

(A) Chromaffin cells of adrenal medulla
(B) Sympathetic ganglia
(C) Brain
(D) All of these

246. Immediate precursor of epinephrine is

(A) Metanephrine (B) Norepinephrine
(C) Dopa (D) Dopamine

247. The chief metabolite of catecholamines is

(A) Metanephrine
(B) Normetanephrine
(C) 3, 4-Dihydroxymandelic acid
(D) Vanillylmandelic acid

248. An enzyme involved in catabolism of catecholamines is

(A) Dopa decarboxylase
(B) Aromatic amino acid decarboxylase
(C) Monoamine oxidase
(D) Catechol oxidas

249. Norepinephrine binds mainly to

(A) α-Adrenergic receptors
(B) β-Adrenergic receptrors
(C) Muscarinic receptors
(D) Nicotinic receptors

250. Astimulatory G-protein transduces the signals from

(A) α_1-and β_1-adrenergic receptors
(B) α_2-and β_2-adrenergic receptors
(C) α_1-and α_2-adrenergic receptors
(D) β_1-and β_2-adrenergic receptors

251. Binding of catecholamines to α_2–adrenergic receptors

(A) Increases the intracellular concentration of cAMP
(B) Increases the intracellular concentration of cGMP
(C) Decreases the intracellular concentration of cAMP
(D) Decreases the intracellular concentration of cGMP

252. Phosphoinositide cascade is activated on binding of catecholamines to

(A) α_1-Adrenergic receptors
(B) α_2-Adrenergic receptors
(C) β_1-Adrenergic receptors
(D) β_2-Adrenergic receptors

253. Epinephrine decreases

(A) Glycogenesis (B) Glycogenolysis
(C) Gluconeogenesis (D) Lipolysis

254. Epinephrine increases the concentration of free fatty acids in plasma by increasing

(A) Extramitochondrial fatty acid synthesis
(B) Mitochondrial fatty acid chain elongation
(C) Microsomal fatty acid chain elongation
(D) Lipolysis in adipose tissue

255. Epinephrine increases all of the following except

(A) Glycogenolysis in muscles
(B) Lipolysis in adipose tissue
(C) Gluconeogenesis in muscles
(D) Glucagon secretion

256. Secretion of catecholamines is increased in

(A) Cushing's syndrome
(B) Addison's disease
(C) Phaeochromocytoma
(D) Simmond's disease

257. Zona glomerulosa of adrenal cortex synthesises

(A) Glucocorticoids
(B) Mineralocorticoids
(C) Androgens
(D) Estrogen and progesterone

258. Cortisol is a

(A) Glucocorticoid (B) Mineralocorticoid
(C) Androgen (D) Estrogen

259. The major mineralcorticoid is

(A) Hydrocortisone (B) Aldosterone
(C) Aldactone A (D) Androstenedione

260. Steroid hormones are synthesised in all of the following except

(A) Testes (B) Ovaries
(C) Adrenal medulla (D) Adrenal cortex

261. Steroid hormones are synthesised from

(A) Cholesterol
(B) 7-Dehydrocholesterol
(C) Calcitriol
(D) 7-Hydroxycholesterol

262. A common intermediate in the synthesis of all the steroid hormones is

(A) Pregnenolone
(B) 17-Hydroxypregnenolone
(C) Corticosterone
(D) Progesterone

263. A common intermediate in the synthesis of cortisol and aldosterone is

(A) Progesterone (B) Testosterone
(C) Estradiol (D) None of these

264. A common intermediate in the synthesis of estrogens is

(A) Cortisol
(B) Andostenedione
(C) Corticosterone
(D) 11-Deoxycorticosterone

265. Glucocorticoids are transported in blood

(A) In association with transcortin chiefly
(B) In association with albumin to some extent
(C) In free form partly
(D) All of these

266. All the following statements about transcortin are true except

(A) It is synthesised in liver
(B) It transports glucocorticoids
(C) It transports aldosterone
(D) It transports progesterone

267. The second messenger for glucocorticoids is

(A) Cyclic AMP
(B) Cyclic GMP
(C) Inositol triphosphate
(D) No second messenger is required

268. Glucocorticoids increase all of the following except

(A) Gluconeogenesis
(B) Lipolysis in extremities
(C) Synthesis of elcosanoida
(D) Hepatic glycogenesis

269. Glucocorticoids increase the synthesis of all of the following except

(A) Glucokinase
(B) Glucose-6-phosphatase
(C) Fructose-1, 6-biphosphatase
(D) Pyruvate carboxylase

270. Secretion of glucocorticoida is regulated by all the following except

(A) Hypothalamus
(B) Anterior pituitary
(C) Feedback control by blood glucose
(D) Feedback control by glucocorticoids

271. Excessive secretion of glucocorticoids raises blood glucose by

(A) Decreasing glycogenesis
(B) Increasing glycogenolysis
(C) Increasing gluconeogenesis
(D) Inhibiting HMP shunt

272. Mineralcorticoids regulate the metabolism of all of the following except

(A) Sodium (B) Potassium
(C) Calcium (D) Chloride

273. Mineralocorticoids increase the tubular reabsorption of

(A) Sodium and calcium
(B) Sodium and potassium
(C) Sodium and chloride
(D) Potassium and chloride

274. Mineralocorticoids increase the tubular secretion of

(A) Sodium (B) Potassium
(C) Chloride (D) Bicarbonate

275. Secretion of mineralcorticoids is increased by

(A) ACTH (B) Angiotensin
(C) Hypokalaemia (D) Hypernatraemia

276. In Addison's disease, there is excessive retention of

(A) Potassium (B) Sodium
(C) Chloride (D) Water

277. In adrenogenital syndrome due to total absence of 21-hydroxylase in adrenal cortex, there is

(A) Deficient secretion of glucocorticoids
(B) Deficient secretion of mineralcorticoids
(C) Excessive secretion of androgens
(D) All of these

278. Spironolactone is an antagonist of

(A) Cortisol (B) Hydrocortisone
(C) Aldosterone (D) Testosterone

279. Androgens are synthesised in

(A) Leydig cells in testes
(B) Sertoli cells in testes
(C) Seminiferous tubules
(D) Prostate gland

280. Testosterone is transported in blood by

(A) Transcortin
(B) Testosterone binding globulin
(C) Testosterone estrogen binding globulin
(D) Albumin

281. The metabolites of androgens are

(A) 17-Hydroxysteroids
(B) 17-Ketosteroids
(C) 11-Hydroxysteroids
(D) 11-Ketosteroids

282. An androgen which is more powerful than testosterone is

(A) Androstenedione (B) Dihydrotestosterone
(C) Androsterone (D) Epiandrosterone

283. Secretion of androgens is increased by

(A) LH (B) FSH
(C) ACTH (D) Growth hormone

284. During late pregnancy, the major source of progesterone is

(A) Adrenal cortex (B) Placenta
(C) Corpus luteum (D) Graafian follicles

285. Progesterone is transported in blood by

(A) Transcortin
(B) Sex hormone binding globulin
(C) Albumin
(D) Testosterone estrogen binding globulin

286. The major metabolite of progesterone is

(A) Pregnenolone (B) Pregnanediol
(C) Estradiol (D) Norethindrone

287. Secretion of progesterone

(A) Is more in first half of menstrual cycle than in second half
(B) Is more in second half of menstrual cycle than in first half
(C) Remains constant during menstrual cycle
(D) Decreases during pregnancy

288. Women become susceptible to osteoporosis after menopause due to decreased

(A) Secretion of Parathormone
(B) Conversion of vitamin D into calcitriol
(C) Secretion of estrogen
(D) Secretion of progesterone

289. A hormone used for detection of pregnancy is

(A) Estrogen
(B) Progesterone
(C) Oxytocin
(D) Chorionic gonadotropin

290. Placenta secretes all of the following except

(A) FSH
(B) Progesterone
(C) Estrogen
(D) Chorionic gonadotropin

291. Gastrin is a polypeptide made up of

(A) Five amino acids
(B) Twelve amino acids
(C) Seventeen amino acids
(D) Twenty amino acids

292. Biological activity of gastrin is present in the

(A) Four N-terminal amino acids
(B) Four C-terminal amino acids
(C) Five N-terminal amino acids
(D) Five C-terminal amino acids

293. All the following statements about β-endorphin are true except μ :

(A) It is a polypeptide
(B) Its precursor is pro-opio-melanocortin
(C) Its receptors are represent in brain
(D) Its action is blocked by morphine

294. All the following statements about epidermal growth factor are true except

(A) It is a protein
(B) It possess quaternary structure
(C) Its receptor is made up of a single polypeptide chain
(D) Its receptor possesses tyrosine kinase domain

295. Met-enkephalin is a

(A) Tripeptide (B) Pentapeptide
(C) Octapeptide (D) Decapeptide

296. Vasoconstrictor effect of ADH is mediated by

(A) cAMP (B) cGMP
(C) Protein kinase C (D) Angiotensin II

297. The rate limiting step in catecholamine synthesis is catalysed by

(A) Phenylalanine hydroxylase
(B) Tyrosine hydroxylase
(C) Dopa decarboxylase
(D) Phenylethanolamine N-methyl transferase

298. Dopa decarboxylase is inhibited by

(A) Epinephrine (B) Norepinephrine
(C) α–Methyldopa (D) None of these

299. Tyrosine hydroxylase is inhibited by

(A) Catecholamines (B) α–Methyldopa
(C) Phenylalanine (D) Vanillyl mandelic acid

300. Urinary excretion of vanillyl madelic acid is increased in

(A) Phaeochromocytoma
(B) Cushing's syndrome
(C) Carcinoid syndrome
(D) Aldosteronism

301. Iodide uptake by thyroid gland is decreased by

(A) Thicyanate (B) Thiouracil
(C) Thiourea (D) Methimazole

302. Binding of growth hormone to its receptor results in phosphorylation of

(A) JAK-2
(B) Growth hormone receptor
(C) STATs
(D) All of these

303. Binding of growth hormone to its receptor results in increased transcription of

(A) c-fos gene (B) c-myc gene
(C) p-53 gene (D) None of these

304. Activation of IRS-1, PI-3 kinase and GRB-2 is brought about by

(A) Glucagon (B) Insulin
(C) Prolactin (D) IGF-2

305. The protein IRS-1 is phosphorylated by

(A) Protein kinase A
(B) Protein kinase C
(C) Tyrosine kinase activity of insulin receptor
(D) Tyrosine kinase activity of IGF-1 receptor

306. Phosphorylated IRS-1 activates GRB-2 which is

(A) G-protein receptor binding protein-2
(B) Growth factor receptor binding protein-2
(C) Growth hormone receptor binding protein-2
(D) Glucocorticoid receptor binding protein-2

307. STAT proteins are

(A) Thermostat proteins of brain
(B) Glucostat proteins of hepatocyte cell membrane
(C) Short term activators of translation
(D) Signal transduction and activators of transcription

308. Activated phospholipase C acts on

(A) Phosphatidyl inositol-4, 5-biphosphate
(B) Inositol-1, 4, 5-triphosphate
(C) Protein kinase C
(D) PI-3 kinase

309. Phospholipase C is activated by

(A) G_s proteins (B) G_i proteins
(C) G_q proteins (D) G_{12} proteins

310. Proteoglycans are made up of proteins and

(A) Glucosamine (B) Mannosamine
(C) Sialic acid (D) Mucopolysaccharides

311 Sweat chlorides are increased in

(A) Cystic fibrosis (B) Pancreatic cancer
(C) Acute pancreatitis (D) None of these

312. All the following statements about cystic fibrosis are correct except

(A) It is inherited as an autosomal recessive disease
(B) It affects a number of exocrine glands
(C) It causes increased sweating
(D) Sweat chlorides are above 60 mEq/L in this disease

313. Radioactive iodine uptake by thyroid gland 24 hours of a test dose is

(A) 1.5–15% of the test done
(B) 15–20% of the test done
(C) 20–40% of the test done
(D) 50–70% of the test done

314. Radioactive iodine uptake by thyroid gland is increased in

(A) Endemic goitre (B) Hyperthyroidism
(C) Myxoedema (D) Creatinism

315. Normal range of total thyroxine in serum is

(A) 0.8–2.4 ng/dl (B) 0.8–2.4 μg/dl
(C) 5–12 ng/dl (D) 5–12 μg/dl

316. Normal range of total tri-iodothyronine in serum is

(A) 0.1–0.2 ng/dl (B) 0.1–0.2 μg/dl
(C) 0.8–2.4 ng/dl (D) 0.8–2.4 μg/dl

317. Administration of TSH increases serum T_3 and T_4 in

(A) Hyperthyroidism of pituitary origin
(B) Hyperthyroidism of thyroid origin
(C) Hypothyroidism of pituitary origin
(D) Hypothyroidism of thyroid origin

318. High level of T_3 and T_4 and low TSH in serum indicates

(A) Hyperthyroidism of pituitary origin
(B) Hypothyroidism of pituitary origin
(C) Hyperthyroidism of thyroid origin
(D) Hypothyroidism of thyroid origin

319. BMR is increased in

(A) Endemic goitre (B) Thyrotoxicosis
(C) Myxoedema (D) Cretinism

320. Which one of the following statements correctly describes eukaryotic DNA?

(A) If uses DNA polymerase with nuclease activities
(B) It is replicated bidirectionally at many points
(C) It contains no repetitive DNA
(D) It is nonlinear

321. Which one of the following causes frame shift mutation?

(A) Transition
(B) Transversion
(C) Deletion
(D) Substitution of purine to pyrimidine

322. The second messenger for many hormones is

(A) ATP (B) cyclic AMP
(C) cGMP (D) UTP

323. The most potent hormone concerned with the retention of sodium in the body is

(A) Cortisone (B) Aldosterone
(C) Corticosterone (D) Cortisol

324. Aspirin blocks the synthesis of

(A) Prostaglandins only
(B) Prostacyclins only
(C) Thromboxanes only
(D) All of these

325. Retention of sodium in the body leads to a retention of

(A) Potassium
(B) Water
(C) Potassium and water
(D) Neither potassium nor water

326. cAMP is so called because it is formed during

(A) TCA cycle
(B) Urea cycle
(C) Rhodopsin cycle
(D) It has a cyclic structure

327. Protein bound iodine is _____ bound to protein.

(A) Iodine (B) Thyroid hormones
(C) Thyroxine (D) Tri iodo thyronine

328. In hypophysectonized animals, fasting produces

(A) Severe hyperglycemia
(B) Hypoglycemia
(C) No change in blood sugar
(D) Mild hyper glycemia

329. Calcitomica is antagonist to

(A) Serotonin
(B) Thyroxine
(C) Tri iodo thyronine
(D) Para thyroid hormone

330. There is polyuria without glycosuria in this disorder

(A) Diabetes insipidus (B) Diabetes millitus
(C) Bronze diabetes (D) Juvenile diabetes

331. In hyperparathyroidism there is

(A) Hypocalcemia (B) Hypophophatemia
(C) Hypokalemia (D) Hyperkalemia

332. Insulin resistance is encountered in

(A) Addison's disease (B) Hypothyroidism
(C) Hypopituctarism (D) Acromegaly

333. Richest source of prostaglandins in a human male is

(A) Blood (B) Urine
(C) Semen (D) C.S.F.

334. One of the following is not used as a second messenger by hormones:

(A) mRNA
(B) cAMP
(C) Calcium ions
(D) Myoinisotol 1, 4, 5 triphosphate

335. This pancreatic hormone increases the blood-sugar level:

(A) Insulin
(B) Glucagon
(C) Pancreozymin
(D) Pancreatic polypeptide

336. Which one of the following statements is fully correct?

(A) Hormones are needed in the diet
(B) Hormones can be elaborated only by endocrine glands
(C) All the hormones enter the cells and perform their function
(D) Hormones are substance synthesized in the body in small quantities and control and regulate metabolic events

337. T_3 is

(A) Thyroxine
(B) Triodo thyronine
(C) Triodo tyrosine
(D) Reverse tri iodo thyronine

338. Whcih of the following hormone is a peptide of less than ten amino acids?

(A) Insulin (B) Growth hormone
(C) Oxytocin (D) Parathyroid hormone

339. Tyrosine of thyroglobulin is acted upon by _____ to give mono and diiodo tyrosines.

(A) Potassium Iodide
(B) Iodine
(C) Iodide I
(D) Higher valency state of iodine (I^+)

340. Whcih of the following hormone does not activate adenylate cyclase?

(A) Epinephrine
(B) Glucagon
(C) Parathyroid hormone
(D) Insulin

341. Pheochromacytoma is a tumor of

(A) adrenal medulla
(B) bone
(C) head of Pancreas
(D) pituitary

342. Which one of the following statements is incorrect?

(A) Insulin increases glucose phosphorylation
(B) Insulin increases glycolysis
(C) Insulin augments HMP shunt
(D) Insulin promotes gluconeogenesis

343. Which of one ring in the structure of the following is aromatic?

(A) Androgens (B) Estrogens
(C) Cholesterol (D) Bile acids

344. Which of one of the following is not GUT hormone?

(A) Motiline (B) Secretion
(C) Gastrin (D) Calcitonin

345. Which of the following hormones are synthesized as prehormones

(A) Vasopressin and oxytocin
(B) Growth hormone and insulin
(C) Insulin and parathyroid hormone
(D) Insulin and Glucagon

346. This hormone has disulphide group:

(A) Glucagon (B) Insulin
(C) T_4 (D) Epinephrine

347. The blood sugar raising action of the hormone of suprarenal cortex is due to

(A) Glyconeogenesis
(B) Glycogenolysis
(C) Glucagon like activity
(D) due to inhibition of glomerular filtration of glucose

348. Hyper insulinism can cause coma since

(A) The chief nutrient for the brain is glucose
(B) The chief nutrient for the heart is glucose
(C) The glucostatic role of the liver is damaged
(D) The kidneys are damaged

349. Which of the following property of prostaglandins has been utilized by chinicians in hospital for

(A) Inducing fever
(B) Causing inflammation
(C) Effecting smooth muscle contraction
(D) Disaggregation of spermatozoa

350. A major structural difference between estrogens and androgens is the fact that

(A) The androgens are usually C_{21} steroids
(B) The estrogens are usually digitonin - precipitable
(C) The androgens have an aromatic ring
(D) The estrogens have an aromatic ring

351. Alloxan can experimentally induce diabetes mellitus due to

(A) Stimulation of α cells of the islets of langerhans
(B) Necrosis of the β cells of the islets
(C) Potentiation of insulinase activity
(D) Epinephrine like action

352. Which of the following alleviates asthma?

(A) PGE_1 only (B) PGE_1 and PGE_2
(C) PGF_2 (D) PGA

353. Thyroxine is derived from

(A) Tyrosine (B) Tyranine
(C) Taurine (D) Tryptaine

354. Adrneal cortical response is poor in

(A) Kwashiorkor (B) Marasmus
(C) Fatty liver (D) Atherosclerosis

355. Protein bound iodine in blood is present to the extent of _____ / dL

(A) 3–8 mg (B) 4–8 mg
(C) 3–8 gm (D) 4–8 gm

356. Prostaglandins are

(A) C_2 unsaturated acids
(B) C_{27} saturated alcohols
(C) C_{20} saturated acids
(D) C_{27} saturated alcohols

357. Which of tne of the following scientists has not worked in the field of prostaglandins?

(A) Voneuler (B) Sultan Karim
(C) Andre robet (D) Kendal

358. The suffix number in the names of prostaglandins gives the number of

(A) OH groups (B) Double bonds
(C) Acid groups (D) Ketoacids

359. One of the important functions of prostacyclins is

(A) Inhibition of platelet aggregation
(B) Contraction of uterus
(C) Decrease of gastric secretion
(D) Relieving osthma

360. Vasopressin is also known as

(A) Antidiabetogenic hormone
(B) Antidiuretic hormone
(C) Somatotropic hormone
(D) Pitoxin

361. Which of the following is used for inducing labour?

(A) Prostaglandins (B) Prostacyclins
(C) Vasopressin (D) Thromboxanes

362. Which of the following does not have disulphide bond?

(A) Oxytocin (B) Vasopressin
(C) Insulin (D) Glucagon

363. Which is incorrect ? Epinephrin promotes the glycogenolysis in

(A) Muscle (B) Liver
(C) Heart (D) None of these

364. Which of one of the following is released by hypothalamus?

(A) Somatostatin
(B) Somatotropic hormone
(C) Somato medin C
(D) Luteinising hormone

365. Which one of the following is not liberated by the adenohypophysis?

(A) Growth hormone (B) TSH
(C) ACTH (D) Gonadotropin

366. Which of the following hormone is not under the control of ACTH?

(A) Aldosterone (B) Cortisol
(C) Corticosterone (D) Deoxycorticosterone

367. Which of the following organ prefers fructose to glucose

(A) Liver (B) Testes
(C) Pancreas (D) Heart

368. Total synthesis of creatine can be done by

(A) Liver (B) Kidneys
(C) Pancreas (D) Heart

369. Thyrotropin releasing hormone is a

(A) Dipeptide (B) Tripeptide
(C) Octapeptide (D) Decapeptide

370. Hypthalamo _____ gonadal oxis, fill up the blank with the suitable word.

(A) Adrenal (B) Thyroid
(C) Hypophyseal (D) Pancreatic

371. The sequence of amino acids in human growth hormone and the synthesis were done by

(A) Sanger (B) Krebs
(C) Chah Holi (D) Molisch

372. Proopiomelanocortin is the precussor of

(A) ACTH (B) β-tropin
(C) Endorphins (D) All of these

373. Adrenalin is synthesized from

(A) Adenine (B) Adenosine
(C) Tyrosine (D) Tryptophan

374. Corticotropin releasing hormone controls the direct release of

(A) Pro-opiomelanocortin
(B) α MSH
(C) β MSH
(D) Endorphins

375. The immediate parent of α, β and γ endorphins is

(A) Pro-opiomelanocortin
(B) β-lipotropin
(C) ATCH
(D) Lipoprotein

376. Prolactin release inhibiting hormone is believed to be

(A) Serotonin (B) Norepinephrine
(C) Dopanine (D) Acetyl choline

377. Whcih one of the following is not a symptom of *cushing's disease*?

(A) Hyperglycemia (B) Hypernatremia
(C) Hirsutism (D) Hyperkalemia

378. Insulin increases the permeability of glucose across the plasma membrane of muscle cells by

(A) Acting on adenylate cycle
(B) By loosening the integrity of the membrane
(C) Through Ca^{2+} ions
(D) By membrane cruting the hexose carries of intracellular organelles and making them fuse with the plasma membrane

379. Somatostatin is produced by

(A) Hypothalamus
(B) Pancreas
(C) Hypothalamus and pancreas
(D) Hypothalamus and Adrenals

380. Insulin like growth hormones are produced by

(A) Hypophysis (B) Liver
(C) Pancreas (D) Thyroid

381. In pheochromocytoma, urine will have

(A) FILGU (B) VMA
(C) 5 HIAA (D) Lysine and Arginine

382. Aldosteronism will present the chemical pathology of

(A) Addison's (B) Cushing's
(C) Grave's (D) Hartnup's

383. One of the following does not bind T_3 and T_4:

(A) Albumin (B) TBG
(C) TBPA (D) Haptoglobin

384. Epinephrine causes in muscle:

(A) Gluconeogenesis (B) Glycogenesis
(C) Glycolysis (D) Glycogenolysis

385. Reverse T_3 is

(A) A synthetic compound given counter the effects of T_3
(B) Formed from T_4 but has no hormone function
(C) Formed by isomerisation of T_3
(D) Formed from T_4 and has hormone function

386. This pancreatic hormone promotes hypogenesis:

(A) Insulin (B) Glucagon
(C) Stomato station (D) Pancreozymine

387. It is unique that the following single antidiabetogenic hormone effectively counter acts the several diabetogenic hormones:

(A) Glucagon (B) Glucocorticoids
(C) Insulin (D) Growth hormone

388. Which of the following statements is correct?

(A) Thyroxine inhibits utilization of glucose
(B) Insulin increases utilization of glucose
(C) Glucagon promotes muscle glycogenolysis
(D) Insulin inhibits lipogenesis from carbohydrates

389. Steroid hormones are synthesized from

(A) Adenine (B) Protein
(C) Vitamin (D) Cholesterol

390. Hormones act only on specific organs or tissues. These are called

(A) Active sites (B) Reaction centre
(C) Target organ/Tissue (D) Physiological site

391. _____ hormone is a single chain polypeptide having 32 amino acids with molecular weight of 3,600.

(A) Testosteron (B) Thyroxine
(C) Calcitonine (D) Vasopressin

392. Which of the following is noted in cushing's syndrome, a tumor associated disease of the adrenal cortex?

(A) Decreased production of epinephrine
(B) Excessive production of epinephrine
(C) Excessive production of vasopressin
(D) Excessive production of cortisol

393. A cup of strong coffee would be expected to

(A) Interfere with synthesis of prostaglandins
(B) Decrease the effects of Glucagon
(C) Enhance the effects of epinephrine
(D) Provide the vitamin nicotinic acid

394. Increased reabsorption of water from the kidney is the major consequence of which of the following hormones?

(A) Cortisol (B) Insulin
(C) Vasopressin (D) Aldosterone

395. Lack of Glucocorticoids and mineral corticoids might be consequence of which of the following defects in the adrenal cortex?

(A) Androstenadione deficiency
(B) Estrone deficiency
(C) 17 α-OH progesterone deficiency
(D) C- α-Hydroxylase deficiency

396. ADP ribosylation is the mode of action of

(A) Cholera toxin
(B) Acetyl choline
(C) Muscerinic receptors
(D) Cyclic AMP

397. Which one of the following hormones is derived most completely from tyrosine?

(A) Glucagon (B) Thyroxine
(C) Insulin (D) Prostaglandins

398. Insulin regulates fatty acid synthesis by

(A) Dephosphorylating of acetyl CoA carboxylase
(B) Activating phosphorylase
(C) Inhibiting malonyl CoA formation
(D) Controlling carnitine-Acyl CoA transferase activity

399. Hormonal stimulation of the formation of the second messenger inositol 1,4,5 triphosphate (IP_3) quickly leads to the release of which other intracellular messenger?

(A) cAMP (B) Prostaglandin
(C) Calcinon (D) Leukotriene

400. Hormone receptors that stimulate cAMP production

(A) are part of a complex of two proteins that transform the external signal into internal cAMP production
(B) are proteins distinct and separate from those that catalyze the production of cAMP
(C) cause release of the catalytic subunit upon binding of the hormone
(D) are not very specific and bind a number of different hormones

401. All the following hormones use cAMP as a second messenger except

(A) Estrogen (B) FSH
(C) Luteinizing (D) Glucagon

402. All the following hormones promote hyperglycemia except

(A) Epinephrine (B) Norepinephrine
(C) Insulin (D) Glucagon

403. Glucagon activates the enzyme *adenyl-cyclase* which causes the increase of blood sugar level. Hence this hormone is called

(A) Hypoglycemic factor
(B) Hyper glycemic factor
(C) Antidiauritic factor
(D) Thyrotropin-releasing factor

404. TSH hormone biochemically is a

(A) Protein (B) Fat
(C) Glycoprotein (D) Carbohydrate

405. The secondary sexual characters in females is effected by

(A) Estrogens (B) Gluco corticoids
(C) MIS (D) None of these

406. A hypochromic microcytic anaemia which increases Fe, store in the bone marrow may be

(A) Folic acid responsive
(B) Vitamin B_{12} responsive
(C) Pyridoxine responsive
(D) Vitamin C responsive

407. Gastric Secretion is regulated by the hormone:

(A) Glucagon (B) Gastrin
(C) Epinephrin (D) ACTH

408. An essential agent for converting glucose to glycogen in liver is

(A) Latic acid (B) GTP
(C) UTP (D) Pyruvic acid

409. Which of the following hormones is not involved in carbohydrate metabolism?

(A) ACTH (B) Glucagon
(C) Vasopressin (D) Growth hormone

410. In the process of transcription, the flow of genetic information is from

(A) DNA to DNA (B) DNA to protein
(C) RNA to protein (D) DNA to RNA

411. Anticodon region is an important part of the structure of

(A) r-RNA (B) t-RNA
(C) m-RNA (D) z-DNA

412. Thyroid function is determined by the use of isotopes:

(A) Na^{24} (B) K^{42}
(C) Ca^{45} (D) I^{131}

413. Pernicious anaemia is diagnosed by the radio active substance:

(A) Cl^{36} (B) P^{32}
(C) CO^{60} (D) Fe^{59}

ANSWERS

1. C	2. B	3. A	4. A	5. A	6. C
7. A	8. B	9. B	10. D	11. B	12. B
13. A	14. A	15. B	16. A	17. B	18. C
19. A	20. C	21. A	22. C	23. A	24. B
25. C	26. A	27. C	28. A	29. C	30. A
31. C	32. C	33. C	34. A	35. A	36. A
37. A	38. C	39. B	40. B	41. A	42. A
43. A	44. C	45. B	46. C	47. A	48. A
49. A	50. B	51. C	52. B	53. B	54. C
55. C	56. D	57. C	58. C	59. B	60. B
61. A	62. B	63. D	64. C	65. A	66. A
67. D	68. B	69. A	70. D	71. C	72. D
73. B	74. B	75. A	76. C	77. A	78. D
79. C	80. C	81. A	82. D	83. B	84. A
85. A	86. C	87. A	88. B	89. A	90. D
91. C	92. B	93. D	94. D	95. A	96. B
97. B	98. A	99. A	100. A	101. A	102. B
103. D	104. C	105. B	106. B	107. A	108. A
109. B	110. C	111. C	112. B	113. A	114. C
115. C	116. C	117. C	118. B	119. C	120. A
121. D	122. C	123. B	124. A	125. B	126. A
127. A	128. B	129. A	130. D	131. B	132. D
133. D	134.C	135. A	136. A	137. D	138. D
139. D	140. A	141. D	142. D	143. A	144. B
145. C	146. D	147. D	148. C	149. C	150. B
151. A	152. B	153. D	154. D	155. B	156. C
157. C	158. C	159. D	160. B	161. C	162. C
163. B	164. A	165. C	166. A	167. B	168. C
169. A	170. B	171. C	172. B	173. C	174. D
175. C	176. D	177. D	178. C	179. D	180. C
181. A	182. B	183. D	184. D	185. B	186. B
187. A	188. D	189. C	190. A	191. B	192. D
193. B	194. B	195. C	196. A	197. A	198. C
199. B	200. C	201. C	202. D	203. A	204. C
205. D	206. C	207. D	208. D	209. A	210. D
211. C	212. A	213. A	214. B	215. A	216. B
217. A	218. D	219. D	220. C	221. D	222. C
223. D	224. A	225. A	226. A	227. C	228. B
229. D	230. B	231. D	232. C	233. A	234. D
235. C	236. B	237. D	238. A	239. A	240. D
241. C	242. A	243. A	244. C	245. D	246. B

247. D	248. C	249. A	250. D	251. C	252. A
253. A	254. D	255. C	256. C	257. A	258. B
259. C	260. A	261. A	262. A	263. A	264. B
265. D	266. C	267. D	268. C	269. A	270. C
271. C	272. C	273. C	274. B	275. B	276. A
277. D	278. C	279. A	280. C	281. B	282. B
283. A	284. B	285. A	286. B	287. B	288. C
289. D	290. A	291. C	292. B	293. D	294. B
295. B	296. C	297. B	298. C	299. A	300. A
301. A	302. D	303. A	304. B	305. B	306. B
307. D	308. A	309. C	310. D	311. A	312. C
313. C	314. B	315. D	316. B	317. C	318. C
319. B	320. C	321. C	322. B	323. B	324. D
325. B	326. D	327. B	328. B	329. D	330. A
331. B	332. D	333. C	334. A	335. B	336. D
337. B	338. C	339. D	340. D	341. A	342. D
343. B	344. D	345. C	346. B	347. A	348. A
349. C	350. D	351. B	352. B	353. A	354. A
355. A	356. A	357. D	358. B	359. A	360. A
361. A	362. D	363. C	364. A	365. D	366. A
367. B	368. C	369. B	370. C	371. C	372. D
373. C	374. A	375. B	376. C	377. D	378. D
379. C	380. B	381. B	382. B	383. D	384. D
385. B	386. A	387. C	388. B	389. D	390. C
391. C	392. D	393. C	394. C	395. D	396. A
397. B	398. A	399. C	400. B	401. A	402. C
403. B	404. C	405. A	406. D	407. B	408. C
409. C	410. D	411. B	412. D	413. C	

CHAPTER 9

NUCLEIC ACIDS

1. A nucleoside consists of

(A) Nitrogenous base
(B) Purine or pyrimidine base + sugar
(C) Purine or pyrimidine base + phosphorous
(D) Purine + pyrimidine base + sugar + phosphorous

2. A nucleotide consists of

(A) A nitrogenous base like choline
(B) Purine + pyrimidine base + sugar + phosphorous
(C) Purine or pyrimidine base + sugar
(D) Purine or pyrimidine base + phosphorous

3. A purine nucleotide is

(A) AMP (B) UMP
(C) CMP (D) TMP

4. A pyrimidine nucleotide is

(A) GMP (B) AMP
(C) CMP (D) IMP

5. Adenine is

(A) 6-Amino purine
(B) 2-Amino-6-oxypurine
(C) 2-Oxy-4-aminopyrimidine
(D) 2, 4-Dioxypyrimidine

6. 2, 4-Dioxypyrimidine is

(A) Thymine (B) Cystosine
(C) Uracil (D) Guanine

7. The chemical name of guanine is

(A) 2,4-Dioxy-5-methylpyrimidine
(B) 2-Amino-6-oxypurine
(C) 2-Oxy-4-aminopyrimidine
(D) 2, 4-Dioxypyrimidine

8. Nucleotides and nucleic acids concentration are often also expressed in terms of

(A) ng (B) mg
(C) meq (D) OD at 260 nm

9. The pyrimidine nucleotide acting as the high energy intermediate is

(A) ATP (B) UTP
(C) UDPG (D) CMP

10. The carbon of the pentose in ester linkage with the phosphate in a nucleotide structure is

(A) C_1 (B) C_3
(C) C_4 (D) C_5

11. Uracil and ribose form

(A) Uridine (B) Cytidine
(C) Guanosine (D) Adenosine

12. The most abundant free nucleotide in mammalian cells is

(A) ATP (B) NAD
(C) GTP (D) FAD

13. The mean intracellular concentration of ATP in mammalian cell is about

(A) 1 mM (B) 2 mM
(C) 0.1 mM (D) 0.2 mM

14. The nucleic acid base found in mRNA but not in DNA is

(A) Adenine (B) Cytosine
(C) Guanine (D) Uracil

15. In RNA moleule 'Caps'

(A) Allow tRNA to be processed
(B) Are unique to eukaryotic mRNA
(C) Occur at the 3′ end of tRNA
(D) Allow correct translation of prokaryotic mRNA

16. In contrast to eukaryotic mRNA, prokaryotic mRNA

(A) Can be polycistronic
(B) Is synthesized with introns
(C) Can only be monocistronic
(D) Has a poly A tail

17. The size of small stable RNA ranges from

(A) 0–40 nucleotides
(B) 40–80 nucleotides
(C) 90–300 nucleotides
(D) More than 320 nucleotides

18. The number of small stable RNAs per cell ranges from

(A) 10–50,000
(B) 50,000–1,00,000
(C) 1,00,000–10,00,000
(D) More than 10 lakhs

19. Molecular weight of heterogenous nuclear RNA (hnRNA) is

(A) More than 10^7 (B) 10^5 to 10^6
(C) 10^4 to 10^5 (D) Less than 10^4

20. In RNA molecule guanine content does not necessarily equal its cytosine content nor does its adenine content necessarily equal its uracil content since it is a

(A) Single strand molecule
(B) Double stranded molecule
(C) Double stranded helical molecule
(D) Polymer of purine and pyrimidine ribonucleotides

21. The nitrogenous base present in the RNA molecule is

(A) Thymine (B) Uracil
(C) Xanthine (D) Hypoxanthine

22. RNA does not contain

(A) Uracil (B) Adenine
(C) Thymine (D) Ribose

23. The sugar moiety present in RNA is

(A) Ribulose (B) Arabinose
(C) Ribose (D) Deoxyribose

24. In RNA molecule

(A) Guanine content equals cytosine
(B) Adenine content equals uracil
(C) Adenine content equals guanine
(D) Guanine content does not necessarily equal its cytosine content.

25. Methylated purines and pyrimidines are characteristically present in

(A) mRNA (B) hnRNA
(C) tRNA (D) rRNA

26. Thymine is present in

(A) tRNA (B) Ribosomal RNA
(C) Mammalian mRNA (D) Prokaryotic mRNA

27. The approximate number of nucleotides in tRNA molecule is

(A) 25 (B) 50
(C) 75 (D) 100

28. In every cell, the number of tRNA molecules is at least

(A) 10 (B) 20
(C) 30 (D) 40

29. The structure of tRNA appears like a

(A) Helix (B) Hair pin
(C) Clover leaf (D) Coil

30. Although each specific tRNA differs from the others in its sequence of nucleotides, all tRNA molecules contain a base paired stem that terminates in the sequence CCA at

(A) 3′ Termini (B) 5′ Termini
(C) Anticodon arm (D) 3′5′-Termini

31. Transfer RNAs are classified on the basis of the number of base pairs in

(A) Acceptor arm (B) Anticodon arm
(C) D arm (D) Extra arm

32. In tRNA molecule D arm is named for the presence of the base:

(A) Uridine (B) Pseudouridine
(C) Dihydrouridine (D) Thymidine

33. The acceptor arm in the tRNA molecule has

(A) 5 Base pairs (B) 7 Base pairs
(C) 10 Base pairs (D) 20 Base pairs

34. In tRNA molecule, the anticodon arm possesses

(A) 5 Base pairs (B) 7 Base pairs
(C) 8 Base pairs (D) 10 Base pairs

35. The TψC arm in the tRNA molecule possesses the sequence

(A) T, pseudouridine and C
(B) T, uridine and C
(C) T, dihydrouridine and C
(D) T, adenine and C

36. Double helical structure model of the DNA was proposed by

(A) Pauling and Corey
(B) Peter Mitchell
(C) Watson and Crick
(D) King and Wooten

37. DNA does not contain

(A) Thymine (B) Adenine
(C) Uracil (D) Deoxyribose

38. The sugar moiety present in DNA is

(A) Deoxyribose (B) Ribose
(C) Lyxose (D) Ribulose

39. DNA rich in A-T pairs have

(A) 1 Hydrogen bond (B) 2 Hydrogen bonds
(C) 3 Hydrogen bonds (D) 4 Hydrogen bonds

40. In DNA molecule

(A) Guanine content does not equal cytosine content
(B) Adenine content does not equal thymine content
(C) Adenine content equals uracil content
(D) Guanine content equals cytosine content

41. DNA rich in G-C pairs have

(A) 1 Hydrogen bond (B) 2 Hydrogen bonds
(C) 3 Hydrogen bonds (D) 4 Hydrogen bonds

42. The fact that DNA bears the genetic information of an organism implies that

(A) Base composition should be identical from species to species
(B) DNA base composition should charge with age
(C) DNA from different tissues in the same organism should usually have the same base composition
(D) DNA base composition is altered with nutritional state of an organism

43. The width (helical diameter) of the double helix in B-form DNA in nm is

(A) 1 (B) 2
(C) 3 (D) 4

44. The number of base pair in a single turn of B-form DNA about the axis of the molecule is

(A) 4 (B) 8
(C) 10 (D) 12

45. The distance spanned by one turn of B-form DNA is

(A) 1.0 nm (B) 2.0 nm
(C) 3.0 nm (D) 3.4 nm

46. In a DNA molecule the thymine concentration is 30%, the guanosine concentration will be

(A) 10% (B) 20%
(C) 30% (D) 40%

47. IN a DNA molecule, the guanosine content is 40%, the adenine content will be

(A) 10% (B) 20%
(C) 30% (D) 40%

48. An increased melting temperature of duplex DNA results from a high content of

(A) Adenine + Guanine
(B) Thymine + Cytosine
(C) Cytosine + Guanine
(D) Cytosine + Adenine

49. A synthetic nucleotide analogue, 4-hydroxypyrazolopyrimidine is used in the treatment of

(A) Acute nephritis
(B) Gout
(C) Cystic fibrosis of lung
(D) Multiple myeloma

50. A synthetic nucleotide analogue, used in the chemotherapy of cancer and viral infections is

(A) Arabinosyl cytosine
(B) 4-Hydroxypyrazolopyrimidine
(C) 6-Mercaptopurine
(D) 6-Thioguanine

51. Histamine is formed from histidine by the enzyme histidine decarboxylase in the presence of

(A) NAD (B) FMN
(C) HS-CoA (D) B_6-PO_4

52. Infantile convulsions due to lesser formation of gamma amino butyric acid from glutamic acid is seen in the deficiency of

(A) Glutamate-dehydrogenase
(B) Pyridoxine
(C) Folic acid
(D) Thiamin

53. Which of the following amino acids produce a vasoconstrictor on decarboxylation?

(A) Histidine (B) Tyrosine
(C) Threonine (D) Arginine

54. The degradation of RNA by pancreatic ribonuclease produces

(A) Nucleoside 2-Phosphates
(B) Nucleoside 5′-phosphates
(C) Oligonucleosides
(D) Nucleoside 3′-phosphate and oligonucleotide

55. Intestinal nucleosidases act on nucleosides and produce

(A) Purine base only (B) Phosphate only
(C) Sugar only (D) Purine or pyrimidine bases and sugars

56. In purine biosynthesis carbon atoms at 4 and 5 position and N at 7 position are contributed by

(A) Glycine (B) Glutamine
(C) Alanine (D) Threonine

57. N^{10}-formyl and N^5N^{10}-methenyl tetrahydrofolate contributes purine carbon atoms at position

(A) 4 and 6 (B) 4 and 5
(C) 5 and 6 (D) 2 and 8

58. In purine nucleus nitrogen atom at 1 position is derived from

(A) Aspartate (B) Glutamate
(C) Glycine (D) Alanine

59. The key substance in the synthesis of purine, phosphoribosyl pyrophosphate is formed by

(A) α-D-ribose 5-phosphate
(B) 5-phospho β-D-ribosylamine
(C) D-ribose
(D) Deoxyribose

60. In purine biosynthesis ring closure in the molecule formyl glycinamide ribosyl-5-phosphate requires the cofactors:

(A) ADP (B) NAD
(C) FAD (D) ATP and Mg^{++}

61. Ring closure of formimidoimidazole carboxamide ribosyl-5-phosphate yields the first purine nucleotide:

(A) AMP (B) IMP
(C) XMP (D) GMP

62. The cofactors required for synthesis of adenylosuccinate are

(A) ATP, Mg^{++} (B) ADP
(C) GTP, Mg^{++} (D) GDP

63. Conversion of inosine monophosphate to xanthine monophosphate is catalysed by

(A) IMP dehydrogenase
(B) Formyl transferase
(C) Xanthine-guanine phosphoribosyl transferase
(D) Adenine phosphoribosyl transferase

64. Phosphorylation of adenosine to AMP is catalysed by

(A) Adenosine kinase
(B) Deoxycytidine kinase
(C) Adenylosuccinase
(D) Adenylosuccinate synthetase

65. The major determinant of the overall rate of denovo purine nucleotide biosynthesis is the concentration of

(A) 5-phosphoribosyl 1-pyrophosphate
(B) 5-phospho β-D-ribosylamine
(C) Glycinamide ribosyl-5-phosphate
(D) Formylglycinamide ribosyl-5-phosphate

66. An enzyme which acts as allosteric regulator and sensitive to both phosphate concentration and to the purine nucleotides is

(A) PRPP synthetase
(B) PRPP glutamyl midotransferase
(C) HGPR Tase
(D) Formyl transferase

67. PRPP glutamyl amidotransferase, the first enzyme uniquely committed to purine synthesis is feed back inhibited by

(A) AMP (B) IMP
(C) XMP (D) CMP

68. Conversion of formylglycinamide ribosyl-5-phosphate to formyl-glycinamide ribosyl-5-phosphate is inhibited by

(A) Azaserine (B) Diazonorleucine
(C) 6-Mercaptopurine (D) Mycophenolic acid

69. In the biosynthesis of purine nucleotides the AMP feed back regulates

(A) Adenylosuccinase
(B) Adenylosuccinate synthetase
(C) IMP dehydrogenase
(D) HGPR Tase

70. 6-Mercapto purine inhibits the conversion of

(A) IMP→XMP
(B) Ribose 5 phosphate → PRPP
(C) PRPP → 5-phospho → β -D-ribosylamine
(D) Glycinamide ribosyl 5-phosphate → formylglycinamide ribosyl-5-phosphate

71. Purine biosynthesis is inhibited by

(A) Aminopterin (B) Tetracyclin
(C) Methotrexate (D) Chloramphenicol

72. Pyrimidine and purine nucleoside biosynthesis share a common precursor:

(A) PRPP (B) Glycine
(C) Fumarate (D) Alanine

73. Pyrimidine biosynthesis begins with the formation from glutamine, ATP and CO_2, of

(A) Carbamoyl aspartate
(B) Orotate
(C) Carbamoyl phosphate
(D) Dihydroorotate

74. The two nitrogen of the pyrimidine ring are contributed by

(A) Ammonia and glycine
(B) Asparate and carbamoyl phosphate
(C) Glutamine and ammonia
(D) Aspartate and ammonia

75. A cofactor in the conversion of dihydroorotate to orotic acid, catalysed by the enzyme dihydroorotate dehydrogenase is

(A) FAD (B) FMN
(C) NAD (D) NADP

76. The first true pyrimidine ribonucleotide synthesized is

(A) UMP (B) UDP
(C) TMP (D) CTP

77. UDP and UTP are formed by phosphorylation from

(A) AMP (B) ADP
(C) ATP (D) GTP

78. Reduction of ribonucleotide diphosphates (NDPs) to their corresponding deoxy ribonucleotide diphosphates (dNDPs) involves

(A) FMN (B) FAD
(C) NAD (D) NADPH

79. Conversion of deoxyuridine monophosphate to thymidine monophosphate is catalysed by the enzyme:

(A) Ribonucleotide reductase
(B) Thymidylate synthetase
(C) CTP synthetase
(D) Orotidylic acid decarboxylase

80. d-UMP is converted to TMP by

(A) Methylation (B) Decarboxylation
(C) Reduction (D) Deamination

81. UTP is converted to CTP by

(A) Methylation (B) Isomerisation
(C) Amination (D) Reduction

82. Methotrexate blocks the synthesis of thymidine monophosphate by inhibiting the activity of the enzyme:

(A) Dihydrofolate reductase
(B) Orotate phosphoribosyl transferase
(C) Ribonucleotide reductase
(D) Dihydroorotase

83. A substrate for enzymes of pyrimidine nucleotide biosynthesis is

(A) Allopurinol (B) Tetracylin
(C) Chloramphenicol (D) Puromycin

84. An enzyme of pyrimidine nucleotide biosynthesis sensitive to allosteric regulation is

(A) Aspartate transcarbamoylase
(B) Dihydroorotase
(C) Dihydroorotate dehydrogenase
(D) Orotidylic acid decarboxylase

85 An enzyme of pyrimidine nucleotides biosynthesis regulated at the genetic level by apparently coordinate repression and derepression is

(A) Carbamoyl phosphate synthetase
(B) Dihydroorotate dehydrogenase
(C) Thymidine kinase
(D) Deoxycytidine kinase

86. The enzyme aspartate transcarbamoylase of pyrimidine biosynthesis is inhibited by

(A) ATP (B) ADP
(C) AMP (D) CTP

87. In humans end product of purine catabolism is

(A) Uric acid (B) Urea
(C) Allantoin (D) Xanthine

88. In humans purine are catabolised to uric acid due to lack of the enzyme:

(A) Urease (B) Uricase
(C) Xanthine oxidase (D) Guanase

89. In mammals other than higher primates uric acid is converted by

(A) Oxidation to allantoin
(B) Reduction to ammonia
(C) Hydrolysis to ammonia
(D) Hydrolysis to allantoin

90. The correct sequence of the reactions of catabolism of adenosine to uric acid is

(A) Adenosine→hypoxanthine→xanthine→uric acid
(B) Adenosine→xanthine→inosine→uric acid
(C) Adenosine→inosine→hypoxanthine→ xanthine uric acid
(D) Adenosine→xanthine→inosine→hypoxanthine uric acid

91. Gout is a metabolic disorder of catabolism of

(A) Pyrimidine (B) Purine
(C) Alanine (D) Phenylalanine

92. Gout is characterized by increased plasma levels of

(A) Urea (B) Uric acid
(C) Creatine (D) Creatinine

93. Lesch-Nyhan syndrome, the sex linked recessive disorder is due to the lack of the enzyme:

(A) Hypoxanthine-guanine phosphoribosyl transferse
(B) Xanthine oxidase
(C) Adenine phosphoribosyl transferase
(D) Adenosine deaminase

94. Lesch-Nyhan syndrome, the sex linked, recessive absence of HGPRTase, may lead to

(A) Compulsive self destructive behaviour with elevated levels of urate in serum
(B) Hypouricemia due to liver damage
(C) Failure to thrive and megaloblastic anemia
(D) Protein intolerance and hepatic encephalopathy

95. The major catabolic product of pyrimidines in human is

(A) β-Alanine (B) Urea
(C) Uric acid (D) Guanine

96. Orotic aciduria type I reflects the deficiency of enzymes:

(A) Orotate phosphoribosyl transferase and orotidylate decarboxylase
(B) Dihydroorotate dehydrogenase
(C) Dihydroorotase
(D) Carbamoyl phosphate synthetase

97. Orotic aciduria type II reflects the deficiency of the enzyme:

(A) Orotate phosphoribosyl transferase
(B) Orotidylate decarboxylase
(C) Dihydroorotase
(D) Dihydroorotate dehydrogenase

98. An autosomal recessive disorder, xanthinuria is due to deficiency of the enzymes:

(A) Adenosine deaminase
(B) Xanthine oxidase
(C) HGPRTase
(D) Transaminase

99. Enzymic deficiency in β-aminoisobutyric aciduria is

(A) Adenosine deaminase
(B) Xanthine oxidase
(C) Orotidylate decarboxylase
(D) Transaminase

100. Polysomes lack in

(A) DNA (B) mRNA
(C) rRNA (D) tRNA

101. Genetic information flows from

(A) DNA to DNA
(B) DNA to RNA
(C) RNA to cellular proteins
(D) DNA to cellular proteins

102. Genetic code is

(A) Collection of codon
(B) Collection of amino acids
(C) Collection of purine nucleotide
(D) Collection of pyrimidine nucleotide

103. Degeneracy of genetic code implies that

(A) Codons do not code for specific amino acid
(B) Multiple codons must decode the same amino acids
(C) No anticodon on tRNA molecule
(D) Specific codon decodes many amino acids

104. Genetic code is

(A) Overlapping (B) Non-overlapping
(C) Not universal (D) Ambiguous

105. mRNA is complementary to the nucleotide sequence of

(A) Coding strand (B) Ribosomal RNA
(C) tRNA (D) Template strand

106. In DNA replication the enzyme required in the first step is

(A) DNA directed polymerase
(B) Unwinding proteins
(C) DNA polymerase
(D) DNA ligase

107. The smallest unit of DNA capable of coding for the synthesis of a polypeptide is

(A) Operon (B) Repressor gene
(C) Cistron (D) Replicon

108. Termination of the synthesis of the RNA molecule is signaled by a sequence in the template strand of the DNA molecule, a signal that is recognized by a termination protein, the

(A) Rho (ρ) factor (B) σ factor
(C) δ factor (D) ε factor

109. After termination of the synthesis of RNA molecule, the core enzymes separate from the DNA template. The core enzymes then recognize a promoter at which the synthesis of a new RNA molecule commences, with the assistance of

(A) Rho (ρ) factor (B) δ factor
(C) β factor (D) σ factor

110. In the process of transcription in bacterial cells

(A) Initiation requires rho protein
(B) RNA polymerase incorporates methylated bases in correct sequence
(C) Both the sigma unit and core enzymes of RNA polymerase are required for accurate promotor site binding
(D) Primase is necessary for initiation

111. The correct statement concerning RNA and DNA polymerases is

(A) RNA polymerase use nucleoside diphosphates
(B) RNA polymerase require primers and add bases at 5′ end of the growing polynucleotide chain
(C) DNA polymerases can add nucleotides at both ends of the chain
(D) All RNA and DNA polymerases can add nucleotides only at the 3′ end of the growing polynucleotide chain

112. The eukaryotic nuclear chromosomal DNA

(A) Is a linear and unbranched molecule
(B) Is not associated with a specific membranous organelle
(C) Is not replicated semiconservatively
(D) Is about of the same size as each prokaryotic chromoses

113. The function of a repressor protein in an operon system is to prevent synthesis by binding to

(A) The ribosome
(B) A specific region of the operon preventing transcription of structural genes
(C) The RNA polymerase
(D) A specific region of the mRNA preventing translation to protein

114. All pribnow boxes are variants of the sequence:

(A) 5′–TATAAT –3′ (B) 5′–GAGCCA –3′
(C) 5′–UAACAA –3′ (D) 5′–TCCTAG –3′

115. 5′-Terminus of mRNA molecule is capped with

(A) Guanosine triphosphate
(B) 7-Methylguanosine triphophate
(C) Adenosine triphosphate
(D) Adenosine diphosphate

116. The first codon to be translated on mRNA is

(A) AUG (B) GGU
(C) GGA (D) AAA

117. AUG, the only identified codon for methionine is important as

(A) A releasing factor for peptide chains
(B) A chain terminating codon
(C) Recognition site on tRNA
(D) A chain initiating codon

118. In biosynthesis of proteins the chain terminating codons are

(A) UAA, UAG and UGA
(B) UGG, UGU and AGU
(C) AAU, AAG and GAU
(D) GCG, GCA and GCU

119. The formation of initiation complex during protein synthesis requires a factor:

(A) IF-III (B) EF-I
(C) EF-II (D) IF-I

120. The amino terminal of all polypeptide chain at the time of synthesis in E. coli is tagged to the amino acid residue:

(A) Methionine (B) Serine
(C) N-formyl methinine (D) N-formal serine

121. Initiation of protein synthesis begins with binding of

(A) 40 S ribosomal unit on mRNA
(B) 60 S ribosomal unit
(C) Charging of tRNA with specific amino acid
(D) Attachment of aminoacyl tRNA on mRNA

122. Initiation of protein synthesis requires

(A) ATP (B) AMP
(C) GDP (D) GTP

123. The enzyme amino acyl tRNA synthetase is involved in

(A) Dissociation of discharged tRNA from 80S ribosome
(B) Charging of tRNA with specific amino acids
(C) Termination of protein synthesis
(D) Nucleophilic attack on esterified carboxyl group of peptidyl tRNA

124. In the process of activation of amino acids for protein synthesis, the number of high energy phosphate bond equivalent utilised is

(A) 0 (B) 1
(C) 2 (D) 4

125 Translation results in a product known as

(A) Protein (B) tRNA
(C) mRNA (D) rRNA

126. In the process of elongation of chain binding of amino acyl tRNA to the A site requires

(A) A proper codon recognition
(B) GTP
(C) EF-II
(D) GDP

127. The newly entering amino acyl tRNA into A site requires

(A) EF-II (B) Ribosomal RNA
(C) mRNA (D) EF-I

128. The α-amino group of the new amino acyl tRNA in the A site carries out a nucleophilic attack on the esterified carboxyl group of the peptidyl tRNA occupying the P site. This reaction is catalysed by

(A) DNA polymerase
(B) RNA polymerase
(C) Peptidyl transferase
(D) DNA ligase

129. The nucleophilic attack on the esterified carboxyl group of the peptidyl-tRNA occupying the P site and the α-amino group of the new amino acyl tRNA, the number of ATP required by the amino acid on the charged tRNA is

(A) Zero (B) One
(C) Two (D) Four

130. Translocation of the newly formed peptidyl tRNA at the A site into the empty P site involves

(A) EF-II, GTP
(B) EF-I, GTP
(C) EF-I, GDP
(D) Peptidyl transferase, GTP

131. In eukaryotic cells

(A) Formylated tRNA is important for initiation of translation
(B) Cyclohexamide blocks elongation during translation
(C) Cytosolic ribosomes are smaller than those found in prokaryotes
(D) Erythromycin inhibits elongation during translation

132. The mushroom poison amanitin is an inhibitor of

(A) Protein synthesis (B) mRNA synthesis
(C) DNA synthesis (D) Adenosine synthesis

133. Tetracylin prevents synthesis of polypeptide by

(A) Blocking mRNA formation from DNA
(B) Releasing peptides from mRNA-tRNA complex
(C) Competing with mRNA for ribosomal binding sites
(D) Preventing binding of aminoacyl tRNA

134. In prokaryotes, chloramphenicol

(A) Causes premature release of the polypeptide chain
(B) Causes misreading of the mRNA
(C) Depolymerises DNA
(D) Inhibits peptidyl transferase activity

135 Streptomycin prevents synthesis of polypeptide by

(A) Inhibiting initiation process
(B) Releasing premature polypeptide
(C) Inhibiting peptidyl transferase activity
(D) Inhibiting translocation

136. Erythromycin acts on ribosomes and inhibit

(A) Formation of initiation complex
(B) Binding of aminoacyl tRNA
(C) Peptidyl transferase activity
(D) Translocation

137. The binding of prokaryotic DNA dependent RNA polymerase to promoter sites of genes is inhibited by the antibiotic:

(A) Puromycin (B) Rifamycin
(C) Terramycin (D) Streptomycin

138. The gene which is transcribed during repression is

(A) Structural (B) Regulator
(C) Promoter (D) Operator

139 The gene of lac operon which has constitutive expression is

(A) i (B) c
(C) z (D) p

140. The minimum effective size of an operator for lac repressor binding is

(A) 5 base pairs (B) 10 base pairs
(C) 15 base pairs (D) 17 base pairs

141 To commence structural gene transcription the region which should be free on lac operation is

(A) Promoter site (B) Operator locus
(C) Y gene (D) A gene

142. In the lac operon concept, a protein molecule is

(A) Operator (B) Inducer
(C) Promoter (D) Repressor

143. The catabolite repression is mediated by a catabolite gene activator protein (CAP) in conjunction with

(A) AMP (B) GMP
(C) cAMP (D) Cgmp

144. The enzyme DNA ligase

(A) Introduces superhelical twists
(B) Connects the end of two DNA chains
(C) Unwinds the double helix
(D) Synthesises RNA primers

145. Restriction endonucleases

(A) Cut RNA chains at specific locations
(B) Excise introns from hnRNA
(C) Remove Okazaki fragments
(D) Act as defensive enzymes to protect the host bacterial DNA from DNA of foreign organisms

146. The most likely lethal mutation is

(A) Substitution of adenine for cytosine
(B) Insertion of one nucleotide
(C) Deletion of three nucleotides
(D) Substitution of cytosine for guanine

147. In the following partial sequence of mRNA, a mutation of the template DNA results in a change in codon 91 to UAA. The type of mutation is

88	89	90	91	92	93	94
GUC	GAC	CAG	UAG	GGC	UAA	CCG

(A) Missene (B) Silent
(C) Nonsense (D) Frame shit

148. Restriction endonucleases recognize and cut a certain sequence of

(A) Single stranded DNA
(B) Double stranded DNA
(C) RNA
(D) Protein

149. Positive control of induction is best described as a control system in which an operon functions

(A) Unless it is switched off by a derepressed repressor protein
(B) Only after a repressor protein is inactivated by an inducer
(C) Only after an inducer protein, which can be inactivated by a corepressor, switches it on
(D) Only after an inducer protein, which is activated by an inducer, switch it on

150. Interferon

(A) Is virus specific
(B) Is a bacterial product
(C) Is a synthetic antiviral agent
(D) Requires expression of cellular genes

151. Repressor binds to DNA sequence and regulate the transcription. This sequence is called

(A) Attenuator (B) Terminator
(C) Anti terminator (D) Operator

152. Okazaki fragment is related to

(A) DNA synthesis (B) Protein synthesis
(C) mRNA formation (D) tRNA formation

153. The region of DNA known as TATA BOX is the site for binding of

(A) DNA polymerase
(B) DNA topoisomerase
(C) DNA dependent RNA polymerase
(D) Polynucleotide phosphorylase

154. Reverse transcriptase is capable of synthesising

(A) RNA → DNA (B) DNA → RNA
(C) RNA → RNA (D) DNA → DNA

155. A tetrovirus is

(A) Polio virus (B) HIV
(C) Herpes virus (D) Tobacco mosaic virus

156. Peptidyl transferase activity is located in

(A) Elongation factor
(B) A charged tRNA molecule
(C) Ribosomal protein
(D) A soluble cytosolic protein

157. Ultraviolet light can damage a DNA strand causing

(A) Two adjacent purine residue to form a covalently bounded dimer
(B) Two adjacent pyrimidine residues to form covalently bonded dimer
(C) Disruption of phosphodiesterase linkage
(D) Disruption of non-covalent linkage

158. Defective enzyme in Hurler's syndrome is

(A) α-L-diuronidase
(B) Iduronate sulphatase
(C) Arylsulphatase B
(D) C-acetyl transferase

159. Presence of arginine can be detected by

(A) Sakaguchi reaction
(B) Million-Nasse reaction
(C) Hopkins-Cole reaction
(D) Gas chromatography

160. A nitrogenous base that does not occur in mRNA is

(A) Cytosine (B) Thymine
(C) Uracil (D) All of these

161. In nucleotides, phosphate is attached to sugar by

(A) Salt bond (B) Hydrogen bond
(C) Ester bond (D) Glycosidic bond

162. Cyclic AMP can be formed from

(A) AMP (B) ADP
(C) ATP (D) All of these

163. A substituted pyrimidine base of pharmacological value is

(A) 5-Iododeoxyuridine
(B) Cytisine arabinoside
(C) 5-Fluorouracil
(D) All of these

164 The 'transforming factor' discovered by Avery, McLeod and McCarty was later found to be

(A) mRNA (B) tRNA
(C) DNA (D) None of these

165. In DNA, the complementary base of adenine is

(A) Guanine (B) Cytosine
(C) Uracil (D) Thymine

166. In DNA, three hydrogen bonds are formed between

(A) Adenine and guanine
(B) Adenine and thymine
(C) Guanine and cytosine
(D) Thymine and cytosine

167. Left handed double helix is present in

(A) Z-DNA (B) A-DNA
(C) B-DNA (D) None of these

168. Nuclear DNA is present in combination with

(A) Histones (B) Non-histones
(C) Both (A) and (B) (D) None of these

169. Number of guanine and cytosine residues is equal in

(A) mRNA (B) tRNA
(C) DNA (D) None of these

170. Alkalis cannot hydrolyse

(A) mRNA (B) tRNA
(C) rRNA (D) DNA

171. Codons are present in

(A) Template strand of DNA
(B) mRNA
(C) tRNA
(D) rRNA

172. Amino acid is attached to tRNA at

(A) 5′-End (B) 3′-End
(C) Anticodon (D) DHU loop

173. In prokaryotes, the ribosomal subunits are

(A) 30 S and 40 S (B) 40 S and 50 S
(C) 30 S and 50 S (D) 40 S and 60 S

174. Ribozymes are

(A) Enzymes present in ribosomes
(B) Enzymes which combine the ribosomal subunits
(C) Enzymes which dissociate
(D) Enzymes made up of RNA

175. The smallest RNA among the following is

(A) rRNA (B) hnRNA
(C) mRNA (D) tRNA

176. The number of adenine and thymine bases is equal in

(A) DNA (B) mRNA
(C) tRNA (D) rRNA

177. The number of hydrogen bonds between adenine and thymine in DNA is

(A) One (B) Two
(C) Three (D) Four

178. The complementary base of adenine in RNA is

(A) Thymine (B) Cystosine
(C) Guanine (D) Uracil

179. Extranuclear DNA is present in

(A) Ribosomes
(B) Endoplasmic reticulum
(C) Lysosomes
(D) Mitochondria

180. Mitochondrial DNA is present in

(A) Bacteria (B) Viruses
(C) Eukaryotes (D) All of these

181. Ribothymidine is present in

(A) DNA (B) tRNA
(C) rRNA (D) hnRNA

182. Ten base pairs are present in one turn of the helix in

(A) A-DNA (B) B-DNA
(C) C-DNA (D) Z-DNA

183. Transfer RNA transfers

(A) Information from DNA to ribosomes
(B) Information from mRNA to cytosol
(C) Amino acids from cytosol to ribosomes
(D) Proteins from ribosomes to cytosol

184. Ceramidase is deficient in

(A) Fabry's disease (B) Farber's disease
(C) Krabbe's disease (D) Tay-Sachs disease

185. Ceramide is present in all of the following except

(A) Plasmalogens (B) Cerebrosides
(C) Sulphatides (D) Sphingomyelin

186. Nucleotides required for the synthesis of nucleic acids can be obtained from

(A) Dietary nucleic acids and nucleotides
(B) De novo synthesis
(C) Salvage of pre-existing bases and nucleosides
(D) De novo synthesis and salvage

187. De novo synthesis of purine nucleotide occurs in

(A) Mitochondria (B) Cytosol
(C) Microsmes (D) Ribosomes

188. The nitrogen atoms for de novo synthesis of purine nucleotides are provided by

(A) Aspartate and glutamate
(B) Aspartate and glycine
(C) Aspartate, glutamine and glycine
(D) Aspartate, glutamate and glycine

189 For de novo synthesis of purine nucleotides, glycine provides

(A) One nitrogen atom
(B) One nitrogen and one carbon atom
(C) Two carbon atoms
(D) One nitrogen and two carbon atoms

190. For de novo synthesis of purine nucleotides, aspartate provides

(A) Nitrogen 1 (B) Nitrogen 3
(C) Nitrogen 7 (D) Nitrogen 9

191. In the purine nucleus, carbon 6 is contributed by

(A) Glycine (B) CO_2
(C) Aspartate (D) Glutamine

192. 5-Phosphoribosyl-1-pyrophosphate is required for the synthesis of

(A) Purine nucleotides (B) Pyrimidine nucleotides
(C) Both (A) and (B) (D) None of these

193. Inosine monophophate is an intermediate during the de novo synthesis of

(A) AMP and GMP (B) CMP and UMP
(C) CMP and TMP (D) All of these

194. Xanthosine monophosphate is an intermediate during de novo synthesis of

(A) TMP (B) CMP
(C) AMP (D) GMP

195. In the pathway of de novo synthesis of purine nucleotides, all the following are allosteric enzymes except

(A) PRPP glutamyl amido transferase
(B) Adenylosuccinate synthetase
(C) IMP dehydrogenase
(D) Adenylosuccinase

196. All of the following enzymes are unique to purine nucleotide synthesis except

(A) PRPP synthetase
(B) PRPP glutamyl amido transferase
(C) Adenylosuccinate synthetase
(D) IMP dehydrogenase

197. PRPP synthetase is allosterically inhibited by

(A) AMP (B) ADP
(C) GMP (D) All of these

198. An allosteric inhibitor of PRPP glutamyl amido transferase is

(A) AMP (B) ADP
(C) GMP (D) All of these

199. An allosteric inhibitor of adenylosuccinate synthetase is

(A) AMP (B) ADP
(C) GMP (D) GDP

200. An allosteric inhibitor of IMP dehydrogenase is

(A) AMP (B) ADP
(C) GMP (D) GDP

201. GMP is an allosteric inhibitor of all the following except

(A) PRPP synthetase
(B) PRPP glutamyl amido synthetase
(C) IMP dehydrogenase
(D) Adenylosuccinate synthetase

202. AMP is an allosteric inhibitor of

(A) PRPP synthetase
(B) Adenylosucciante synthetase
(C) Both (A) and (B)
(D) None of these

203. The first reaction unique to purine nucleotide synthesis is catalysed by

(A) PRPP synthetase
(B) PRPP glutamyl amido transferase
(C) Phosphoribosyl glycinamide synthetase
(D) Formyl transferase

204. Free purine bases which can be salvaged are

(A) Adenine and guanine
(B) Adenine and hypoxanthine
(C) Guanine and hypoxanthine
(D) Adenine, guanine and hypoxanthine

205. The enzyme required for salvage of free purine bases is

(A) Adenine phosphoribosyl transferase
(B) Hypoxanthine guanine phosphoribosyl transferase
(C) Both (A) and (B)
(D) None of these

206. Deoxycytidine kinase can salvage

(A) Adenosine
(B) Adenosine and deoxyadenosine
(C) Adenosine and guanosine
(D) Adenine and adenosine

207. Adenosine kinase can salvage

(A) Adenosine
(B) Adenosine and deoxyadenosine
(C) Adenosine and guanosine
(D) Adenine and adenosine

208. Salvage of purine bases is regulated by

(A) Adenosine phosphoribosyl transferase
(B) Hypoxanthine guanine phosphoribosyl transferase
(C) Availability of PRPP
(D) None of these

209. The available PRPP is used preferentially for

(A) De novo synthesis of purine nucleotides
(B) De novo synthesis of pyrimidine nucleotides
(C) Salvage of purine bases
(D) Salvage of pyrimidine bases

210. The end product of purine catabolism in man is

(A) Inosine (B) Hypoxanthine
(C) Xanthine (D) Uric acid

211. The enzyme common to catabolism of all the purines is

(A) Adenosine deaminase
(B) Purine nucleoside phosphorylase
(C) Guanase
(D) None of these

212. Uric acid is the end product of purine as well as protein catabolism in

(A) Man (B) Fish
(C) Birds (D) None of these

213. Daily uric acid excretion in adult men is

(A) 2–6 mg (B) 20–40 mg
(C) 150–250 mg (D) 40–600 mg

214. Dietary purines are catabolised in

(A) Liver (B) Kidneys
(C) Intesitnal mucosa (D) All of these

215. De novo synthesis of pyrimidine nucleotides occurs in

(A) Mitochondria (B) Cytosol
(C) Microsomes (D) Ribosomes

216. An enzyme common to de novo synthesis of pyrimidine nucleotides and urea is

(A) Urease
(B) Carbamoyl phosphate synthetase
(C) Aspartate transcarbamoylase
(D) Argininosuccinase

217. The nitrogen atoms of pyrimidine nucleus are provided by

(A) Glutamate
(B) Glutamate and aspartate
(C) Glutamine
(D) Glutamine and aspartate

218. The carbon atoms of pyrimidine nucleus are provided by

(A) Glycine and aspartate
(B) CO_2 and aspartate
(C) CO_2 and glutamate
(D) CO_2 and glutamine

219. Nitrogen at position 1 of pyrimidine nucleus comes from

(A) Glutamine (B) Glutamate
(C) Glycine (D) Aspartate

220. Nitrogen at position 3 of pyrimidine nucleus comes from

(A) Glutamine (B) Glutamate
(C) Glycine (D) Aspartate

221. The carbon atom at position 2 of pyrimidine nucleus is contributed by

(A) CO_2 (B) Glycine
(C) Aspartate (D) Glutamine

222. Aspartate contributes the following carbon atoms of the pyrimidine nucelus:

(A) C_2 and C_4 (B) C_5 and C_6
(C) C_2, C_4 and C_6 (D) C_4, C_5 and C_6

223. The first pyrimidine nucleotide to be formed in de novo synthesis pathway is

(A) UMP (B) CMP
(C) CTP (D) TMP

224. Conversion of uridine diphosphate into deoxyuridine diphosphate requires all the following except

(A) Ribonucleotide reductase
(B) Thioredoxin
(C) Tetrahydrobiopterin
(D) NADPH

225. Amethopterin and aminopterin decrease the synthesis of

(A) TMP (B) UMP
(C) CMP (D) All of these

226. For synthesis of CTP and UTP, the amino group comes from

(A) Amide group of Asparagine
(B) Amide group of glutamine
(C) α-Amino group of glutamine
(D) α-Amino group of glutamate

227. CTP synthetase forms CTP from

(A) CDP and inorganic phosphate
(B) CDP and ATP
(C) UTP and glutamine
(D) UTP and glutamate

228. For the synthesis of TMP from dump, a coenzyme is required which is

(A) N^{10}- Formyl tetrahydrofolate
(B) N^5- Methyl tetrahydrofolate
(C) N^5, N^{10}- Methylene tetrahydrofolate
(D) N^5- Formimino tetrahydrofolate

229. All the enzymes required for de novo synthesis of pyrimidine nucleotides are cytosolic except

(A) Carbamoyl phosphate synthetase
(B) Aspartate transcarbamoylase
(C) Dihydro-orotase
(D) Dihydro-orotate dehydrogenase

230. During de novo synthesis of pyrimidine nucleotides, the first ring compound to be formed is

(A) Carbamoyl aspartic acid
(B) Dihydro-orotic acid
(C) Orotic acid
(D) Orotidine monophosphate

231. Tetrahydrofolate is required as a coenzyme for the synthesis of

(A) UMP (B) CMP
(C) TMP (D) All of these

232. All of the following statements about thioredoxin reductase are true except:

(A) It requires NADH as a coenzyme
(B) Its substrates are ADP, GDP, CDP and UDP
(C) It is activated by ATP
(D) It is inhibited by dADP

233. De novo synthesis of pyrimidine nucleotides is regulated by

(A) Carbamoyl phosphate synthetase
(B) Aspartate transcarbamoylase
(C) Both (A) and (B)
(D) None of these

234. Cytosolic carbamoyl phosphate synthetase is inhibited by

(A) UTP (B) CTP
(C) PRPP (D) TMP

235. Cytosolic carbamoyl phosphate synthetase is activated by

(A) Glutamine (B) PRPP
(C) ATP (D) Aspartate

236. Aspartate transcarbamoylase is inhibited by

(A) CTP (B) PRPP
(C) ATP (D) TMP

237. The following cannot be salvaged in human beings:

(A) Cytidine (B) Deoxycytidine
(C) Cytosine (D) Thymidine

238. β -Aminoisobytyrate is formed from catabolism of

(A) Cytosine (B) Uracil
(C) Thymine (D) Xanthine

239. Free ammonia is liberated during the catabolism of

(A) Cytosine (B) Uracil
(C) Thymine (D) All of these

240. β -Alanine is formed from catabolism of

(A) Thymine
(B) Thymine and cytosine
(C) Thymine and uracil
(D) Cytosine and uracil

241. The following coenzyme is required for catabolism of pyrimidine bases:

(A) NADH (B) NADPH
(C) $FADH_2$ (D) None of these

242. Inheritance of primary gout is

(A) Autosomal recessive
(B) Autosomal dominant
(C) X-linked recessive
(D) X-linked dominant

243. The following abnormality in PRPP synthetase can cause primary gout:

(A) High V_{max}
(B) Low K_m
(C) Resistance to allosteric inihbition.
(D) All of these

244. All the following statements about primary gout are true except

(A) Its inheritance is X-linked recessive
(B) It can be due to increased activity of PRPP synthetase
(C) It can be due to increased activity of hypoxanthine guanine phosphoribosyl transferase
(D) De novo synthesis of purines is increased in it

245. All of the following statements about uric acid are true except

(A) It is a catabolite of purines
(B) It is excreted by the kidneys
(C) It is undissociated at pH above 5.8
(D) It is less soluble than sodium urate

246. In inherited deficiency of hypoxanthine guanine phosphoribosyl transferase

(A) De novo synthesis of purine nucleotides is decreased
(B) Salvage of purines is decreased
(C) Salvage of purines is increased
(D) Synthesis of uric acid is decreased

247. All of the following statements about uric acid are true except

(A) It can be formed from allantoin
(B) Formation of uric acid stones in kidneys can be decreased by alkalinisation of urine
(C) Uric acid begins to dissociate at pH above 5.8
(D) It is present in plasma mainly as monosodium urate

248. All of the following statements about primary gout are true except

(A) Uric acid stones may be formed in kidneys
(B) Arthritis of small joints occurs commonly
(C) Urinary excretion of uric acid is decreased
(D) It occurs predominantly in males

249. All of the following statements about allopurinol are true except

(A) It is a structural analogue of uric acid
(B) It can prevent uric acid stones in the kidneys
(C) It increases the urinary excretion of xanthine and hypoxanthine
(D) It is a competitive inhibitor of xanthine oxidase

250. Orotic aciduria can be controlled by

(A) Oral administration of orotic acid
(B) Decreasing the dietary intake of orotic acid
(C) Decreasing the dietary intake of pyrimidines
(D) Oral administration of uridine

251. All of the following occur in orotic aciduria except

(A) Increased synthesis of pyrimidine nucleotides
(B) Increased excretion of orotic acid in urine
(C) Decreased synthesis of cytidine triphosphate
(D) Retardation of growth

252. Inherited deficiency of adenosine deaminase causes

(A) Hyperuricaemia and gout
(B) Mental retardation
(C) Immunodeficiency
(D) Dwarfism

253. Complete absence of hypoxanthine guanine phospharibosyl transferase causes

(A) Primary gout (B) Immunodeficiency
(C) Uric acid stones (D) Lesh-Nyhan syndrome

254. Increased urinary excretion of orotic acid can occur in deficiency of

(A) Orotate phosphoribosyl transferase
(B) OMP decarboxylase
(C) Mitochondrial ornithine transcarbamoylase
(D) Any of the above

255. All of the following can occur in Lesch-Nyhan syndrome except

(A) Gouty arthritis
(B) Uric acid stones
(C) Retarted growth
(D) Self-mutiliating behaviour

256. Inherited deficiency of purine nucleoside phosphorylase causes

(A) Dwarfism (B) Mental retardation
(C) Immunodeficiency (D) Gout

257. Deoxyribonucleotides are formed by reduction of

(A) Ribonucleosides
(B) Ribonucleoside monophosphates
(C) Ribonucleoside diphosphates
(D) Ribonucleoside triphosphates

258. An alternate substrate for orotate phosphoribosyl transferase is

(A) Allopurinol (B) Xanthine
(C) Hypoxanthine (D) Adenine

259. Mammals other than higher primates do not suffer from gout because they

(A) Lack xanthine oxidase
(B) Lack adenosine deaminase
(C) Lack purine nucleoside phosphorylase
(D) Possess uricase

260. Hypouricaemia can occur in

(A) Xanthine oxidase deficiency
(B) Psoriasis
(C) Leukaemia
(D) None of these

261. Synthesis of DNA is also known as

(A) Duplication (B) Replication
(C) Transcription (D) Translation

262. Replication of DNA is

(A) Conservative (B) Semi-conservative
(C) Non-conservative (D) None of these

263. Direction of DNA synthesis is

(A) $5' \rightarrow 3'$ (B) $3' \rightarrow 5'$
(C) Both (A) and (B) (D) None of these

264. Formation of RNA primer:

(A) Precedes replication
(B) Follows replication
(C) Precedes transcription
(D) Follows transcription

265. Okazaki pieces are made up of

(A) RNA (B) DNA
(C) RNA and DNA (D) RNA and proteins

266. Okazaki pieces are formed during the synthesis of

(A) mRNA (B) tRNA
(C) rRNA (D) DNA

267. After formation of replication fork

(A) Both the new strands are synthesized discontinuously
(B) One strand is synthesized continuously and the other discontinuously
(C) Both the new strands are synthesized continuously
(D) RNA primer is required only for the synthesis of one new strand

268. An Okazaki fragment contains about

(A) 10 Nucleotides
(B) 100 Nucleotides
(C) 1,000 Nucleotides
(D) 10,000 Nucleotides

269. RNA primer is formed by the enzyme:

(A) Ribonuclease (B) Primase
(C) DNA polymerase I (D) DNA polymerase III

270. In RNA, the complementary base of adenine is

(A) Cytosine (B) Guanine
(C) Thymine (D) Uracil

271. During replication, the template DNA is unwound

(A) At one of the ends (B) At both the ends
(C) At multiple sites (D) Nowhere

272. During replication, unwinding of double helix is initiated by

(A) DNAA protein (B) DnaB protein
(C) DNAC protein (D) Rep protein

273. For unwinding of double helical DNA,

(A) Energy is provided by ATP
(B) Energy is provided by GTP
(C) Energy can be provided by either ATP or GTP
(D) No energy is required

274. Helicase and DNAB protein cause

(A) Rewinding of DNA and require ATP as a source of energy
(B) Rewinding of DNA but do not require any source of energy
(C) Unwinding of DNA and require ATP as a source of energy
(D) Unwinding of DNA but do not require any source of energy

275. The unwound strands of DNA are held apart by

(A) Single strand binding protein
(B) Double strand binding protein
(C) Rep protein
(D) DNAA protein

276. Deoxyribonucleotides are added to RNA primer by

(A) DNA polymerase I
(B) DNA polymerase II
(C) DNA polymerase III holoenzyme
(D) All of these

277. Ribonucleotides of RNA primer are replaced by deoxyribonucleotides by the enzyme:

(A) DNA polymerase I
(B) DNA polymerase II
(C) DNA polymerase III holoenzyme
(D) All of these

278. DNA fragments are sealed by

(A) DNA polymerase II
(B) DNA ligase
(C) DNA gyrase
(D) DNA topoisomerase II

279. Negative supercoils are introduced in DNA by

(A) Helicase
(B) DNA ligase
(C) DNA gyrase
(D) DNA polymerase III holoenzyme

280. Reverse transcriptase activity is present in the eukaryotic:

(A) DNA polymerase α
(B) DNA polymerase γ
(C) Telomerase
(D) DNA polymerase II

281. DNA polymerase III holoenzyme possesses

(A) Polymerase activity
(B) 3′→5′ Exonuclease activity
(C) 5′→3′ Exonuclease and polymerase activities
(D) 3′→5′ Exonuclease and polymerase activities

282. DNA polymerase I possesses

(A) Polymerase activity
(B) 3′→5′ Exonuclease activity
(C) 5′→3′ Exonuclease activity
(D) All of these

283. 3′→5′ Exonuclease activity of DNA polymerase I

(A) Removes ribonucleotides
(B) Adds deoxyribonucleotides
(C) Corrects errors in replication
(D) Hydrolyses DNA into mononucleotides

284. All of the following statements about RNA-dependent DNA polymerase are true except:

(A) It synthesizes DNA using RNA as a template
(B) It is also known as reverse transcriptase
(C) It synthesizes DNA in 5′→3′ direction
(D) It is present in all the viruses

285. Reverse transcriptase catalyses

(A) Synthesis of RNA
(B) Breakdown of RNA
(C) Synthesis of DNA
(D) Breakdown of DNA

286. DNA A protein can bind only to

(A) Positively supercoiled DNA
(B) Negatively supercoiled DNA
(C) Both (A) and (B)
(D) None of these

287. DNA topoisomerase I of *E. coli* catalyses

(A) Relaxation of negatively supercoiled DNA
(B) Relaxation of positively supercoiled DNA
(C) Conversion of negatively supercoiled DNA into positively supercoiled DNA
(D) Conversion of double helix into supercoiled DNA

288. In mammalian cell cycle, synthesis of DNA occurs during

(A) S phase (B) G_1 phase
(C) Mitotic Phase (D) G_2 phase

289. Melting temperature of DNA is the temperature at which

(A) Solid DNA becomes liquid
(B) Liquid DNA evaporates
(C) DNA changes from double helix into supercoiled DNA
(D) Native double helical DNA is denatured

290. Melting temperature of DNA is increased by its

(A) A and T content (B) G and C content
(C) Sugar content (D) Phosphate content

291. Buoynat density of DNA is increased by its

(A) A and T content (B) G and C content
(C) Sugar content (D) None of these

292. Relative proportions of G and C versus A and T in DNA can be determined by its

(A) Melting temperature
(B) Buoyant density
(C) Both (A) and (B)
(D) None of these

293. Some DNA is present in mitochondria of

(A) Prokaryotes (B) Eukaryotes
(C) Both (A) and (B) (D) None of these

294. Satellite DNA contains

(A) Highly repetitive sequences
(B) Moderately repetitive sequences
(C) Non-repetitive sequences
(D) DNA-RNA hybrids

295. Synthesis of RNA and a DNA template is known as

(A) Replication (B) Translation
(C) Transcription (D) Mutation

296. Direction of RNA synthesis is

(A) 5′ → 3′ (B) 3′ → 5′
(C) Both (A) and (B) (D) None of these

297. DNA-dependent RNA polymerase is a

(A) Monomer (B) Dimer
(C) Trimer (D) Tetramer

298. DNA-dependent RNA polymerase requires the following for its catalytic activity:

(A) Mg^{++} (B) Mn^{++}
(C) Both (A) and (B) (D) None of these

299. The initiation site for transcription is recognized by

(A) α–Subunit of DNA-dependent RNA polymerase
(B) β–Subunit of DNA-dependent RNA polymerase
(C) Sigma factor
(D) Rho factor

300. The termination site for transcription is recognized by

(A) α–Subunit of DNA-dependent RNA polymerase
(B) β–Subunit of DNA-dependent RNA polymerase
(C) Sigma factor
(D) Rho factor

301. Mammalian RNA polymerase I synthesises

(A) mRNA (B) rRNA
(C) tRNA (D) hnRNA

302. Mammalian RNA polymerase III synthesises

(A) rRNA (B) mRNA
(C) tRNA (D) hnRNA

303. In mammals, synthesis of mRNA is catalysed by

(A) RNA polymerase I (B) RNA polymerase II
(C) RNA polymerase III (D) RNA polymerase IV

304. Heterogeneous nuclear RNA is the precursor of

(A) mRNA (B) rRNA
(C) tRNA (D) None of these

305. Post-transcriptional modification of hnRNA involves all of the following except

(A) Addition of 7-methylguanosine triphosphate cap
(B) Addition of polyadenylate tail
(C) Insertion of nucleotides
(D) Deletion of introns

306. Newly synthesized tRNA undergoes post-transcriptional modifications which include all the following except

(A) Reduction in size
(B) Methylation of some bases
(C) Formation of pseudouridine
(D) Addition of C-C-A terminus at 5′ end

307. Post-transcriptional modification does not occur in

(A) Eukaryotic tRNA (B) Prokaryotic tRNA
(C) Eukaryotic hnRNA (D) Prokaryotic mRNA

308. A consensus sequence on DNA, called TATA box, is the site for attachment of

(A) RNA-dependent DNA polymerase
(B) DNA-dependent RNA polymerase
(C) DNA-dependent DNA polymerase
(D) DNA topoisomerase II

309. Polyadenylate tail is not present in mRNA synthesising

(A) Globin (B) Histone
(C) Apoferritin (D) Growth hormone

310. Introns are present in DNA of

(A) Viruses (B) Bacteria
(C) Man (D) All of these

311. A mammalian DNA polymerase among the following is

(A) DNA polymerase α
(B) DNA polymerase I
(C) DNA polymerase II
(D) DNA polymerase IV

312. Mammalian DNA polymerase γ is located in

(A) Nucleus (B) Nucleolus
(C) Mitochondria (D) Cytosol

313. Replication of nuclear DNA in mammals is catalysed by

(A) DNA polymerase α
(B) DNA polymerase β
(C) DNA polymerase γ
(D) DNA polymerase III

314. Primase activity is present in

(A) DNA polymerase II
(B) DNA polymerase α
(C) DNA polymerase β
(D) DNA polymerase δ

315. The mammalian DNA polymerase involved in error correction is

(A) DNA polymerase α
(B) DNA polymerase β
(C) DNA polymerase γ
(D) DNA polymerase δ

316. Novobicin inhibits the synthesis of

(A) DNA (B) mRNA
(C) tRNA (D) rRNA

317. Ciprofloxacin inhibits the synthesis of

(A) DNA (B) mRNA
(C) tRNA (D) rRNA

318. Ciprofloxacin inhibits

(A) DNA topisomerase II
(B) DNA polymerase I
(C) DNA polymerase III
(D) DNA gyrase

319. Rifampicin inhibits

(A) Unwinding of DNA
(B) Initiation of replication
(C) Initiation of translation
(D) Initiation of transcription

320. Actinomycin D binds to

(A) Double stranded DNA
(B) Single stranded DNA
(C) Single stranded RNA
(D) DNA-RNA hybrid

321. DNA contains some palindromic sequences which

(A) Mark the site for the formation of replication forks
(B) Direct DNA polymerase to turn back to replicate the other strand
(C) Are recognized by restriction enzymes
(D) Are found only in bacterial DNA

322. Introns in genes

(A) Encode the amino acids which are removed during post-translational modification
(B) Encode signal sequences which are removed before secretion of the proteins
(C) Are the non-coding sequences which are not translated
(D) Are the sequences that intervene between two genes

323. All of the following statements about post-transcriptional processing of tRNA are true except

(A) Introns of some tRNA precursors are removed
(B) CCA is added at 3′ end
(C) 7-Methylguanosine triphosphate cap is added at 5′ end
(D) Some bases are methylated

324. α-Amanitin inhibits

(A) DNA polymerase II of prokaryotes
(B) DNA polymerase α of eukaryotes
(C) RNA polymerase II of eukaryotes
(D) RNA-dependent DNA polymerase

325. Ciprofloxacin inhibits the synthesis of

(A) DNA in prokaryotes
(B) DNA in prokaryotes and eukaryotes
(C) RNA in prokaryotes
(D) RNA in prokaryotes and eukaryotes

326. All of the following statements about bacterial promoters are true except

(A) They are smaller than eukaryotic promoters
(B) They have two consensus sequences upstream from the transcription star site
(C) TATA box is the site for attachment of RNA polymerase
(D) TATA box has a high melting temperature

327. All of the following statements about eukaryotic promoters are true except

(A) They may be located upstream or down stream from the structural gene
(B) They have two consensus sequences
(C) One consensus sequence binds RNA polymerase
(D) Mutations in promoter region can decrease the efficiency of transcription of the structural gene

328. In sanger's method of DNA sequence determination, DNA synthesis is stopped by using

(A) 1′, 2′- Dideoxyribonucleoside triphosphates
(B) 2′, 3′- Dideoxyribonucleoside triphosphates
(C) 2′, 4′- Dideoxyribonucleoside triphosphates
(D) 2′, 5′ - Dideoxyribonucleoside triphosphates

329. tRNA genes have

(A) Upstream promoters
(B) Downstream promoters
(C) Intragenic promoters
(D) No promoters

330. All of the following statements about tRNA are true except

(A) It is synthesized as a large precursor
(B) It is processed in the nucelolus
(C) It has no codons or anticodons
(D) Genes for rRNA are present in single copies

331. Anticodons are present on

(A) Coding strand of DNA
(B) mRNA
(C) tRNA
(D) rRNA

332. Codons are present on

(A) Non-coding strand of DNA
(B) hnRNA
(C) tRNA
(D) None of these

333. Nonsense codons are present on

(A) mRNA (B) tRNA
(C) rRNA (D) None of these

334. Genetic code is said to be degenerate because

(A) It can undergo mutations
(B) A large proportion of DNA is non-coding
(C) One codon can code for more than one amino acids
(D) More than one codons can code for the same amino acids

335. All the following statements about genetic code are correct except

(A) It is degenerate (B) It is unambigous
(C) It is nearly universal (D) It is overlapping

336. All of the following statements about nonsense codons are true except

(A) They do not code for amino acids
(B) They act as chain termination signals
(C) They are identical in nuclear and mitochondrial DNA
(D) They have no complementary anticodons

337. A polycistronic mRNA can be seen in

(A) Prokaryotes (B) Eukaryotes
(C) Mitochondria (D) All of these

338. Non-coding sequence are present in the genes of

(A) Bacteria (B) Viruses
(C) Eukaryotes (D) All of these

339. Non-coding sequences in a gene are known as

(A) Cistrons (B) Nonsense codons
(C) Introns (D) Exons

340. Splice sites are present in

(A) Prokaryotic mRNA (B) Eukaryotic mRNA
(C) Eukaryotic hnRNA (D) All of these

341. The common features of introns include all the following except

(A) The base sequence begins with GU
(B) The base sequence ends with AG
(C) The terminal AG sequence is preceded by a purine rich tract of ten nucleotides
(D) An adenosine residue in branch site participates in splicing

342. A splice some contains all the following except

(A) hnRNA (B) snRNAs
(C) Some proteins (D) Ribosome

343. Self-splicing can occur in

(A) Some precursors of rRNA
(B) Some precursors of tRNA
(C) hnRNA
(D) None of these

344. Pribnow box is present in

(A) Prokaryotic promoters
(B) Eukaryotic promoters
(C) Both (A) and (B)
(D) None of these

345. Hogness box is present in

(A) Prokaryotic promoters

(B) Eukaryotic promoters
(C) Both (A) and (B)
(D) None of these

346. CAAT box is present in

(A) Prokaryotic promoters 10 bp upstream of transcription start site
(B) Prokaryotic promoters 35 bp upstream of transcription start site
(C) Eukaryotic promoters 25 bp upstream of transcription start site
(D) Eukaryotic promoters 70–80 bp upstream of transcription start site

347. Eukaryotic promoters contain

(A) TATA box 25bp upstream of transcription start site
(B) CAAT box 70-80 bp upstream of transcription start site
(C) Both (A) and (B)
(D) None of these

348. All the following statements about tRNA are correct except

(A) A given tRNA can be charged with only one particular amino acid
(B) The amino acid is recognized by the anticodon of tRNA
(C) The amino acid is attached to end of tRNA
(D) The anticodon of tRNA finds the complementary codon on mRNA

349. All the following statements about charging of tRNA are correct except

(A) It is catalysed by amino acyl tRNA synthetase
(B) ATP is converted into ADP and Pi in this reaction
(C) The enzyme recognizes the tRNA and the amino acid
(D) There is a separate enzyme for each tRNA

350. All the following statements about recognition of a codon on mRNA by an anticodon on tRNA are correct except

(A) The recognition of the third base of the codon is not very precise
(B) Imprecise recognition of the third base results in wobble
(C) Wobble is partly responsible for the degeneracy of the genetic code
(D) Wobble results in incorporation of incorrect amino acids in the protein

351. The first amino acyl tRNA which initiates translation in eukaryotes is

(A) Mehtionyl tRNA
(B) Formylmethionyl tRNA
(C) Tyrosinyl tRNA
(D) Alanyl tRNA

352. The first amino acyl tRNA which initiates translation in prokaryotes is

(A) Mehtionyl tRNA
(B) Formylmethionyl tRNA
(C) Tyrosinyl tRNA
(D) Alanyl tRNA

353. In eukaryotes, the 40 S pre-initiation complex contains all the following initiation factors except

(A) eIF-1A (B) eIF-2
(C) eIF-3 (D) eIF-4

354. Eukaryotic initiation factors 4A, 4B and 4F bind to

(A) 40 S ribosomal subunit
(B) 60 S ribosomal subunit
(C) mRNA
(D) Amino acyl tRNA

355. The codon which serves as translation start signal is

(A) AUG (B) UAG
(C) UGA (D) UAA

356. The first amino acyl tRNA approaches 40 S ribosomal subunit in association with

(A) eIF-1A and GTP (B) eIF-2 and GTP
(C) eIF-2C and GTP (D) eIF-3 and GTP

357. eIF-1A and eIF-3 are required

(A) For binding of amino acyl tRNA to 40 S ribosomal subunit
(B) For binding of mRNA to 40 S ribosomal subunit
(C) For binding of 60 S subunit to 40 S subunit
(D) To prevent binding of 60 S subunit to 40 S subunit

358. eIF-4 A possesses

(A) ATPase activity (B) GTPase activity
(C) Helicase activity (D) None of these

359. eIF-4 B

(A) Binds to 3′ chain initiation codon on mRNA
(B) Binds to 3′ end of mRNA
(C) Binds to 5′ end of mRNA
(D) Unwinds mRNA near its 5′ end

360. Peptidyl transferase activity is present in

(A) 40 S ribosomal subunit
(B) 60 S ribosomal subunit
(C) eEF-2
(D) Amino acyl tRNA

361. After formation of a peptide bond, mRNA is translocated along the ribosome by

(A) eEF-1 and GTP
(B) eEF-2 and GTP
(C) Peptidyl transferase and GTP
(D) Peptidyl transferase and ATP

362. Binding of formylmehtionyl tRNA to 30 S ribosomal subunit of prokaryotes is inhibited by

(A) Streptomycin (B) Chloramphenicol
(C) Erythromycin (D) Mitomycin

363. Tetracyclines inhibit binding of amino acyl tRNAs to

(A) 30 S ribosomal subunits
(B) 40 S ribosomal subunits
(C) 50 S ribosomal subunits
(D) 60 S ribosomal subunits

364. Peptidyl transferase activity of 50 S ribosomal subunits is inhibited by

(A) Rifampicin (B) Cycloheximide
(C) Chloramphenicol (D) Erythromycin

365. Erythromycin binds to 50 S ribosomal sub unit and

(A) Inhibits binding of amino acyl tRNA
(B) Inhibits Peptidyl transferase activity
(C) Inhibits translocation
(D) Causes premature chain termination

366. Puromycin causes premature chain termination in

(A) Prokaryotes (B) Eukaryotes
(C) Both (A) and (B) (D) None of these

367. Diphtheria toxin inhibits

(A) Prokaryotic EF-1 (B) Prokaryotic EF-2
(C) Eukaryotic EF-1 (D) Eukaryotic EF-2

368. The proteins destined to be transported out of the cell have all the following features except

(A) They possess a signal sequence
(B) Ribosomes synthesizing them are bound to endoplasmic reticulum
(C) After synthesis, they are delivered into Golgi apparatus
(D) They are tagged with ubiquitin

369. SRP receptors involved in protein export are present on

(A) Ribosomes
(B) Endoplasmic reticulum
(C) Golgi appartus
(D) Cell membrane

370. The signal sequence of proteins is cleaved off

(A) On the ribosomes immediately after synthesis
(B) In the endoplasmic reticulum
(C) During processing in Golgi apparatus
(D) During passage through the cell membrane

371. The half-life of a protein depends upon its

(A) Signal sequence
(B) N-terminus amino acid
(C) C-terminus amino acid
(D) Prosthetic group

372. Besides structural genes that encode proteins, DNA contains some regulatory sequences which are known as

(A) Operons (B) Cistrons
(C) Cis-acting elements (D) Trans-acting factors

373. Inducers and repressors are

(A) Enhancer and silencer elements respectively
(B) Trans-acting factors

(C) Cis-acting elements
(D) Regulatory proteins

374. cis-acting elements include

(A) Steroid hormones (B) Calcitriol
(C) Histones (D) Silencers

375. Silencer elements

(A) Are trans-acting factors
(B) Are present between promoters and the structural genes
(C) Decrease the expression of some structural genes
(D) Encode specific repressor proteins

376. trans-acting factors include

(A) Promoters (B) Repressors
(C) Enhancers (D) Silencers

377. Enhancer elements have all the following features except

(A) They increase gene expression through a promoter
(B) Each enhancer activates a specific promoter
(C) They may be located far away from the promoter
(D) They may be upstream or downstream from the promoter

378. Amplification of dihydrofolate reductase gene may be brought about by

(A) High concentrations of folic acid
(B) Deficiency of folic acid
(C) Low concentration of thymidylate
(D) Amethopterin

379. Proteins which interact with DNA and affect the rate of transcription possess the following structural motif:

(A) Helix-turn-helix motif
(B) Zinc finger motif
(C) Leucine zipper motif
(D) All of these

380. Lac operon is a cluster of genes present in

(A) Human beings (B) *E. coli*
(C) Lambda phage (D) All of these

381. Lac operon is a cluster of

(A) Three structural genes
(B) Three structural genes and their promoter
(C) A regulatory gene, an operator and a promoter
(D) A regulatory gene, an operator, a promoter and three structural genes

382. The regulatory i gene of lac operon

(A) Is inhibited by lacotse
(B) Is inhibited by its own product, the repressor protein
(C) Forms a regulatory protein which increases the expression of downstream structural genes
(D) Is constitutively expressed

383. RNA polymerase holoenzyme binds to lac operon at the following site:

(A) i gene (B) z gene
(C) Operator locus (D) Promoter region

384. Trancription of z, y and a genes of lac operon is prevented by

(A) Lactose (B) Allo-lactose
(C) Repressor (D) cAMP

385. Transcription of structural genes of lac operon is prevented by binding of the repressor tetramer to

(A) i gene (B) Operator locus
(C) Promoter (D) z gene

386. The enzymes encoded by z, y and a genes of lac operon are inducible, and their inducer is

(A) Lactose
(B) Allo-lactose
(C) Catabolite gene activator protein
(D) All of these

387. Binding of RNA polymerase holoenzyme to the promoter region of lac operon is facilitated by

(A) Catabolite gene activator protein (CAP)
(B) cAMP
(C) CAP-cAMP complex
(D) None of these

388. Lactose or its analogues act as positive regulators of lac operon by

(A) Attaching to i gene and preventing its expression
(B) Increasing the synthesis of catabolite gene activator protein
(C) Attaching to promoter region and facilitating the binding of RNA polymerase holoenzyme
(D) Binding to repressor subunits so that the repressor cannot attach to the operator locus

389. Expression of structural genes of lac operon is affected by all the following except

(A) Lactose or its analogues
(B) Repressor tetramer
(C) cAMP
(D) CAP-cAMP complex

390. The coding sequences in lac operon include

(A) i gene
(B) i gene, operator locus and promoter
(C) z, y and a genes
(D) i, z, y and a genes

391. Mutations can be caused by

(A) Ultraviolet radiation
(B) Ionising radiation
(C) Alkylating agents
(D) All of these

392. Mutations can be caused by

(A) Nitrosamine (B) Dimethyl sulphate
(C) Acridine (D) All of these

393. Nitrosamine can deaminate

(A) Cytosine to form uracil
(B) Adenine to form xanthine
(C) Guanine to form hypoxanthine
(D) All of these

394. Exposure of DNA to ultraviolet radiation can lead to the formation of

(A) Adenine dimers (B) Guanine dimers
(C) Thymine dimers (D) Uracil dimers

395. Damage to DNA caused by ultraviolet radiation can be repaired by

(A) uvr ABC excinuclease
(B) DNA polymerase I
(C) DNA ligase
(D) All of these

396. Xeroderma pigmentosum results from a defect in

(A) uvr ABC excinuclease
(B) DNA polymerase I
(C) DNA ligase
(D) All of these

397. All the following statements about xeroderma pigmentosum are true except

(A) It is a genetic disease
(B) Its inheritance is autosomal dominant
(C) uvr ABC excinuclease is defective in this disease
(D) It results in multiple skin cancers

398. Substitution of an adenine base by guanine in DNA is known as

(A) Transposition (B) Transition
(C) Transversion (D) Frameshift mutation

399. Substitution of a thymine base by adenine in DNA is known as

((A) Transposition (B) Transition
(C) Transversion (D) Frameshift mutation

400. A point mutation results from

(A) Substitution of a base
(B) Insertion of a base
(C) Deletion of a base
(D) All of these

401. Substitution of a base can result in a

(A) Silent mutation (B) Mis-sense mutation
(C) Nonsense mutation (D) All of these

402. A silent mutation is most likely to result from

(A) Substitution of the first base of a codon
(B) Substitution of the third base of a codon
(C) Conversion of a nonsense codon into a sense codon
(D) Conversion of a sense codon into a nonsense codon

403. The effect of a mis-sense mutation can be

(A) Acceptable (B) Partially acceptable
(C) Unacceptable (D) All of these

404. Amino acid sequence of the encoded protein is not changed in

(A) Silent mutation
(B) Acceptable mis-sense mutation
(C) Both (A) and (B)
(D) None of these

405. Haemoglobin S is an example of a/an

(A) Silent mutation
(B) Acceptable mis-sense mutation
(C) Unacceptable mis-sense mutation
(D) Partially acceptable mis-sense mutation

406. If the codon UAC on mRNA changes into UAG as a result of a base substitution in DNA, it will result in

(A) Silent mutation
(B) Acceptable mis-sense mutation
(C) Nonsense mutation
(D) Frameshift mutation

407. Insertion of a base in a gene can cause

(A) Change in reading frame
(B) Garbled amino acid sequence in the encoded protein
(C) Premature termination of translation
(D) All of these

408. A frameshift mutation changes the reading frame because the genetic code

(A) Is degenerate
(B) Is overlapping
(C) Has no punctuations
(D) Is universal

409. Suppressor mutations occur in

(A) Structural genes (B) Promoter regions
(C) Silencer elements (D) Anticodons of tRNA

410. Suppressor tRNAs can neutralize the effects of mutations in

(A) Structural genes (B) Promoter regions
(C) Enhancer elements (D) All of these

411. Mutations in promoter regions of genes can cause

(A) Premature termination of translation
(B) Change in reading frame of downstream structural gene
(C) Decreased efficiency of transcription
(D) All of these

412. Mitochondrial protein synthesis is inhibited by

(A) Cycloheximide (B) Chloramphenicol
(C) Diptheria toxin (D) None of these

413. All of the following statements about puromycin are true except

(A) It is an alanyl tRNA analogue
(B) It causes premature termination of protein synthesis
(C) It inhibits protein synthesis in prokaryotes
(D) It inhibits protein synthesis in eukaryotes

414. Leucine zipper motif is seen in some helical proteins when leucine residues appear at every

(A) 3rd position (B) 5th position
(C) 7th position (D) 9th position

415. Zinc finger motif is formed in some proteins by binding of zinc to

(A) Two cysteine residues
(B) Two histidine residues
(C) Two arginine residues
(D) Two cysteine and two histidine residues or two pairs of two cysteine residues each

416. Restriction endonucleases are present in

(A) Viruses (B) Bacteria
(C) Eukaryotes (D) All of these

417. Restriction endonucleases split

(A) RNA
(B) Single stranded DNA
(C) Double stranded DNA
(D) DNA-RNA hybrids

418. Restriction endonucleases can recognise

(A) Palindromic sequences
(B) Chimeric DNA
(C) DNA-RNA hybrids
(D) Homopolymer sequences

419. All of the following statements about restriction endonucleases are true except:

(A) They are present in bacteria
(B) They act on double stranded DNA
(C) They recognize palindromic sequences
(D) They always produce sticky ends

420. Which of the following is a palindromic sequence

(A) 5′ – ATGCAG – 3′
(B) 3′ – TACGTC – 5′
(C) 5′ – CGAAGC – 3′
(D) 3′ – GCTTCG – 5′

421. In sticky ends produced by restriction endonucleases

(A) The 2 strands of DNA are joined to each other
(B) The DNA strands stick to the restriction endonuclease
(C) The ends of a double stranded fragment are overlapping
(D) The ends of a double stranded fragment are non overlapping

422. All of the following may be used as expression vectors except

(A) Plasmid (B) Bacteriophage
(C) Baculovirus (D) *E. coli*

423. A plasmid is a

(A) Single stranded linear DNA
(B) Single stranded circular DNA
(C) Double stranded linear DNA
(D) Double stranded circular DNA

424. Fragments of DNA can be identified by the technique of

(A) Western blotting (B) Eastern blotting
(C) Northern blotting (D) Southern blotting

425. A particular RNA in a mixture can be identified by

(A) Western blotting (B) Eastern blotting
(C) Northern blotting (D) Southern blotting

426. A radioactive isotope labeled cDNA probe is used in

(A) Southern blotting (B) Northern blotting
(C) Both (A) and (B) (D) None of these

427. An antibody probe is used in

(A) Southern blotting (B) Northern blotting
(C) Western blotting (D) None of these

428. A particular protein in a mixture can be detected by

A) Southern blotting (B) Northern blotting
(C) Western blotting (D) None of these

429. The first protein synthesized by recombinant DNA technology was

(A) Streptokinase
(B) Human growth hormone
(C) Tissue plasminogen activator
(D) Human insulin

430. For production of eukaryotic protein by recombinant DNA technology in bacteria, the template used is

(A) Eukaryotic gene (B) hnRNA
(C) mRNA (D) All of these

431. Monoclonal antibodies are prepared by cloning

(A) Myeloma cells (B) Hybridoma cells
(C) T-Lymphocytes (D) B-Lymphocytes

432. Myeloma cells are lacking in

(A) TMP synthetase
(B) Formyl transferase
(C) HGPRT
(D) All of these

433. Hybridoma cells are selected by culturing them in a medium containing

(A) Adenine, guanine, cytosine and thymine
(B) Adenine, guanine, cytosine and uracil
(C) Hypoxanthine, aminopterin and thymine
(D) Hypoxanthine, aminopterin and thymidine

434. Myeloma cells and lymphocytes can be fused by using

(A) Calcium chloride (B) Ethidium bromide
(C) Polyethylene glycol (D) DNA polymerase

435. Trials for gene therapy in human beings were first carried out, with considerable success, in a genetic disease called

(A) Cystic fibrosis
(B) Thalassemia
(C) Adenosine deaminase deficiency
(D) Lesch-Nyhan syndrome

436. Chimeric DNA

(A) Is found in bacteriophages
(B) Contains unrelated genes
(C) Has no restriction sites
(D) Is palindromic

437. Which of the following may be used as a cloning vector?

(A) Prokaryotic plasmid (B) Lambda phage
(C) Cosmid (D) All of these

438. The plasmid pBR322 has

(A) Ampicillin resistance gene
(B) Tetracycline resistance gene
(C) Both (A) and (B)
(D) None of these

439. Lambda phage can be used to clone DNA fragments of the size

(A) Upto 3 kilobases (B) Upto 20 kilobases
(C) Upto 45 kilobases (D) Upto 1,000 kilobases

440. DNA fragments upto 45 kilobases in size can be cloned in

(A) Bacterial plasmids
(B) Lambda phage
(C) Cosmids
(D) Yeast artificial chromosomes

441. A cosmid is a

(A) Large bacterial plasmid
(B) Viral plasmid
(C) Hybrid of plasmid and phage
(D) Yeast plasmid

442. Polymerase chain reaction can rapidly amplify DNA sequences of the size

(A) Upto 10 kilobases (B) Upto 45 kilobases
(C) Upto 100 kilobases (D) Upto 1,000 kilobases

443. The DNA polymerase commonly used in polymerase chain reaction is obtained from

(A) *E. coli* (B) Yeast
(C) *T.aquaticus* (D) Eukaryotes

444. Base sequence of DNA can be determined by

(A) Maxam-Gilbert method
(B) Sanger's dideoxy method
(C) Both (A) and (B)
(D) None of these

445. From a DNA-RNA hybrid, DNA can be obtained by addition of

(A) DNA B protein and ATP
(B) Helicase and ATP
(C) DNA topoisomerase I
(D) Alkali

446. Optimum temperature of DNA polymerase of *T. aquaticus* is

(A) 30°C (B) 37°C
(C) 54°C (D) 72°C

447. In addition to Taq polymerase, polymerase chain reaction requires all of the following except

(A) A template DNA
(B) Deoxyribonucleoside triphosphates
(C) Primers
(D) Primase

448. DNA polymerase of *T. aquaticus* is preferred to that of *E. coli* in PCR because

(A) It replicates DNA more efficiently
(B) It doesn't require primers
(C) It is not denatured at the melting temperature of DNA
(D) It doesn't cause errors in replication

449. Twenty cycles of PCR can amplify DNA:

(A) 2^{20} fold (B) 20^2 fold
(C) 20 x 2 fold (D) 20 fold

450. Transgenic animals may be prepared by introducing a foreign gene into

(A) Somatic cells of young animals
(B) Testes and ovaries of animals
(C) A viral vector and infecting the animals with the viral vector
(D) Fertilised egg and implanting the egg into a foster mother

451. Yeast artificial chromosome can be used to amplify DNA sequences of the size

(A) Upto 10 kb (B) Upto 45 kb
(C) Upto 100 kb (D) Upto 1,000 kb

452. DNA finger printing is based on the presence in DNA of

(A) Constant number of tandem repeats
(B) Varibale number of tandem repeats
(C) Non-repititive sequences in each DNA
(D) Introns in eukaryotic DNA

453. All the following statements about restriction fragment length polymorphism are true except

(A) It results from mutations in restriction sites
(B) Mutations in restriction sites can occur in coding or non-coding regions of DNA
(C) It is inherited in Mendelian fashion
(D) It can be used to diagnose any genetic disease

454. Inborn errors of urea cycle can cause all the following except

(A) Vomiting (B) Ataxia
(C) Renal failure (D) Mental retardation

455. Hyperammonaemia type I results from congenital absence of

(A) Glutamate dehydrogenase
(B) Carbamoyl phosphate synthetase
(C) Ornithine transcarbamoylase
(D) None of these

456. Congenital deficiency of ornithine transcarbamoylase causes

(A) Hyperammonaemia type I
(B) Hyperammonaemia type II
(C) Hyperornithinaemia
(D) Citrullinaemia

457. A ketogenic amino acid among the following is

(A) Leucine (B) Serine
(C) Threonine (D) Proline

458. Carbon skeleton of the following amino acid can serve as a substance for gluconeogenesis

(A) Cysteine (B) Aspartate
(C) Glutamate (D) All of these

459. N-Formiminoglutamate is a metabolite of

(A) Glutamate (B) Histidine
(C) Tryptophan (D) Methionine

460. Methylmalonyl CoA is a metabolite of

(A) Valine (B) Leucine
(C) Isoleucine (D) All of these

461. Homogentisic acid is formed from

(A) Homoserine (B) Homocysteine
(C) Tyrosine (D) Tryptophan

462. Maple syrup urine disease results from absence or serve deficiency of

(A) Homogentisate oxidase
(B) Phenylalanine hydroxylase
(C) Branched chain amino acid transaminase
(D) None of these

463. Which of the following is present as a marker in lysosomal enzymes to direct them to their destination?

(A) Glucose-6-phosphate
(B) Mannose-6-phosphate
(C) Galactose-6-phosphate
(D) N-Acetyl neuraminic acid

464. Marfan's syndrome results from a mutation in the gene coding:

(A) Collagen (B) Elastin
(C) Fibrillin (D) Keratin

465. All the following statements about fibronectin are true except

(A) It is glycoprotein
(B) It is a triple helix
(C) It is present in extra cellular matrix
(D) It binds with integrin receptors of cell

466. Fibronectin has binding sites for all of the following except

(A) Glycophorin (B) Collagen
(C) Heparin (D) Integrin receptor

467. Fibronectin is involved in

(A) Cell adhension (B) Cell movement
(C) Both (A) and (B) (D) None of these

468. Glycoproteins are marked for destruction by removal of their

(A) Oligosaccharide prosthetic group
(B) Sialic acid residues
(C) Mannose residues
(D) N-terminal amino acids

469. Glycophorin is present in cell membranes of

(A) Erythrocytes (B) Platelets
(C) Neutrophils (D) Liver

470. Selectins are proteins that can recognise specific

(A) Carbohydrates (B) Lipids
(C) Amino acids (D) Nucleotides

471. Hunter's syndrome results from absence of

(A) Hexosaminidase A
(B) Iduronate sulphatase
(C) Neuraminidase
(D) Arylsulphatase B

472. A cancer cell is characterized by

(A) Uncontrolled cell division
(B) Invasion of neighbouring cells
(C) Spread to distant sites
(D) All of these

473. If DNA of a cancer cell is introduced into a normal cell, the recipient cell

(A) Destroys the DNA
(B) Loses its ability to divide
(C) Dies
(D) Changes into a cancer cell

474. A normal cell can be transformed into a cancer cell by all of the following except

(A) Ionising radiation
(B) Mutagenic chemicals
(C) Oncogenic bacteria
(D) Some viruses

475. Proto-oncogens are present in

(A) Oncoviruses
(B) Cancer cells
(C) Healthy human cells
(D) Prokaryotes

476. All the following statements about proto-oncogenes are true except

(A) They are present in human beings
(B) They are present in healthy cells
(C) Proteins encoded by them are essential
(D) They are expressed only when a healthy cell has been transformed into a cancer cell

477. Various oncogens may encode all of the following except:

(A) Carcinogens
(B) Growth factors
(C) Receptors for growth factors
(D) Signal transducers for growth factors

478. Ras proto-oncogene is converted into oncogene by

(A) A point mutation
(B) Chromosomal translocation
(C) Insertion of a viral promoter upstream of the gene
(D) Gene amplification

479. Ras proto-oncogene encodes

(A) Epidermal growth factor (EGF)
(B) Receptor for EGF
(C) Signal transducer for EGF
(D) Nuclear transcription factor

480. P 53 gene:

(A) A proto-oncogene
(B) An oncogene
(C) A tumour suppressor gene
(D) None of these

481. Retinoblastoma can result from a mutation in

(A) ras proto-oncogene
(B) erbB proto-oncogene
(C) p 53 gene
(D) RB 1 gene

482 All the following statements about retino blastoma are true except

(A) At least two mutations are required for its development
(B) One mutation can be inherited from a parent

(C) Children who have inherited one mutation develop retinoblastoma at a younger age
(D) RB 1 gene promotes the development of retinoblastoma

483. Ames assay is a rapid method for detection of

(A) Oncoviruses
(B) Retroviuses
(C) Chemical carcinogens
(D) Typhoid

484. Amplification of dihydrofolate reductase gene in a cancer cell makes the cell

(A) Susceptible to folic acid deficiency
(B) Less malignant
(C) Resistant to amethopterin therapy
(D) Responsive to amethopterin therapy

485. Conversion of a procarcinogen into a carcinogen often requires

(A) Proteolysis
(B) Microsomal hydroxylation
(C) Exposure to ultraviolet radiation
(D) Exposure to X-rays

486. The only correct statement about oncoviruses is

(A) All the oncoviruses are RNA viruses
(B) Reverse transcriptase is present in all oncoviruses
(C) Viral oncogenes are identical to human protooncogens
(D) Both DNA and RNA viruses can be oncoviruses

487. RB 1 gene is

(A) A tumour suppressor gene
(B) Oncogene
(C) Proto-oncogene
(D) Activated proto-oncogene

488. Cancer cells may become resistant to amethopterin by

(A) Developing mechanisms to destroy amethopterin
(B) Amplification of dihydrofolate reducatse gene
(C) Mutation in the dihydrofolate reductase gene so that the enzyme is no longer inhibited by amethopterin
(D) Developing alternate pathway of thymidylate synthesis

489. The major source of NH_3 produced by the kidney is

(A) Leucine (B) Glycine
(C) Alanine (D) Glutamine

490. Which of these methyl donors is not a quanternary ammonium compound?

(A) Methionine (B) Choline
(C) Betain (D) Betainaldehyde

491. L-glutamic acid is subjected to oxidative deaminition by

(A) L-amino acid dehydrogenase
(B) L-glutamate dehydrogenase
(C) Glutaminase
(D) Glutamine synthetase

492. A prokaryotic ribosome is made up of _____ sub units.

(A) 20 S and 50S (B) 30S and 50S
(C) 30S and 60S (D) 20S and 50S

493. AN Eukaryotic ribosome is made up of _____ sub unit.

(A) 40S and 60S (B) 40S and 50S
(C) 40S and 80S (D) 60S and 80S

494. GTP is not required for

(A) Capping L of mRNA
(B) Fusion of 40S and 60S of ribosome
(C) Accommodation of tRNA amino acid
(D) Formation of tRNA amino acid complex

495. The antibiotic which inhibits DNA dependent RNA polymerase is

(A) Mitomycin C (B) Actinomycin d
(C) Streptomycin (D) Puromycin

496. The antibiotic which cleaves DNA is

(A) Actinomycin d (B) Streptomycin
(C) Puromycin (D) Mitomycin C

497. The antibiotic which has a structure similar to the amino acyl end of tRNA tyrosine is

(A) Actinomycin d (B) Streptomycin
(C) Puromycin (D) Mitomycin c

498. ATP is required for

(A) Fusion of 40S and 60S of ribosome
(B) Accommodation tRNA amino acid in a site of ribosome
(C) Movement of ribosome along mRNA
(D) formation of tRNA amino acid complex

499. What is the subcellular site for the biosynthesis of proteins?

(A) Chromosomes (B) Lymosomes
(C) Ribosomes (D) Centrosomes

500. An animal is in negative nitrogen balance when

(A) Intake exceeds output
(B) New tissue is being synthesized
(C) Output exceeds intake
(D) Intake is equal to output

501. When NH_3 is perfused through a dog's liver _____ is formed, while _____ is formed in the birds liver.

(A) Urea, Uric acid (B) Urea, allantoin
(C) Uric acid, creatinine
(D) Uric acid, Urea

502. Aspartate amino transferase uses the following for transamination:

(A) Glutamic acid and pyruvic acid
(B) Glutamic acid and oxaloacetic acid
(C) Aspartic acid and pyruvic acid
(D) aspartic acid and keto adipic acid

503. Which among the following compounds is not a protein?

(A) Insulin (B) Hheparin
(C) Mucin (D) Pepsin

504. Almost all the urea is formed in this tissue:

(A) Kidney (B) Urethra
(C) Uterus (D) Liver

505. A polyribosome will have about _____ individual ribosomes.

(A) 20 (B) 10
(C) 5 (D) 2

506. Progressive transmethylation of ethanolamine gives

(A) Creatinine
(B) Choline
(C) Methionine
(D) N-methyl nicotinamide

507. Genetic information originates from

(A) Cistron of DNA
(B) Codons of mRNA
(C) Anticodons of tRNA
(D) Histones of nucleoproteins

508. The genetic code operates through

(A) The protein moiety of DNA
(B) Cistrom of DNA
(C) Nucleotide sequence of m RNA
(D) The anticodons of tRNA

509. DNA synthesis in laboratory was first achieved by

(A) Watson and crick (B) Khorana
(C) A.Kornberg (D) Ochoa

510. Among the different types of RNA, which one has the highest M.W.?

(A) mRNA (B) rRNA
(C) yeast RNA (D) tRNA

511. From DNA the genetic message is transcribed into this compound:

(A) Protein (B) mRNA
(C) tRNA (D) rRNA

512. This compound has a double helical structure.

(A) Deoxyribonucleic acid
(B) RNA
(C) Flavine-adevine dinucleotide
(D) Nicotinamide adamine dinucleotide

513. The structural stability of the double helix of DNA is as cribbed largely to

(A) Hydrogen bonding between adjacent purine bases
(B) Hydrophobic bonding between staked purine and pyrinuidine nuclei

(C) Hydrogen bonding between adjacent pyrimidine bases
(E) Hydrogen bonding between purine and pyrimidine bases

514. Which of the following statements about nucleic acid is most correct?

(A) Both pentose nucleic acid and deoxypentose nucleic acid contain the same pyrimidines
(B) Both pentose nucleic acid and deoxypentose nucleic acid and deoxypentose nucleic acid Contain the same purines
(C) RNA contains cytosine and thymine
(D) DNA and RNA are hydrolysed by weak alkali

515. Acid hydrolysis of ribonucleic acid would yield the following major products:

(A) d- deoxyribose, cytosine, adenine
(B) d-ribose, thymine, Guanine
(C) d-ribose, cytosine, uracil, thymine
(D) d-ribose, uracil, adenine, guanine, cytosine

516. RNA does not contain

(A) adenine (B) OH methyl cytosine
(C) d-ribose (D) Uracil

517. Which of the following statements is correct?

(A) a nucleo protein usually contain deoxy sugars of the hexose type
(B) Nucleoproteins are usually absent from the cytoplasm
(C) Nucleoproteins usually are present in the nucleus only
(D) Nucleoproteins usually occur in the nucleus and cytoplasm

518. Whcih of the following compound is present in RNA but absent from DNA?

(A) Thymine (B) Cytosine
(C) Uracil (D) Guanine

519. Nucleic acids can be detected by means of their absorption maxima near 260 nm. Their absorption in this range is due to

(A) Proteins
(B) Purines and pyrimidines
(C) Ribose
(D) Deoxyribose

520. Which of the following contains a deoxy sugar?

(A) RNA (B) DNA
(C) ATP (D) UTP

521. DNA is

(A) Usually present in tissues as a nucleo protein and cannot be separated from its protein component
(B) A long chain polymer in which the internucleotide linkages are of the diester type between C-3′ and C-5′
(C) Different from RNA since in the latter the internucleotide linkages are between C-2′ and C-5′
(D) Hydrolyzed by weal alkali (pH_9 to 100°C)

522. Nobody is the name given to

(A) Ribosome (B) Microsome
(C) Centrosome (D) Nucleosome

523. Transcription is the formation of

(A) DNA from a parent DNA
(B) mRNA from a parent mRNA
(C) pre mRNA from DNA
(D) protein through mRNA

524. Translation is the formation of

(A) DNA from DNA
(B) mRNA from DNA
(C) Protein through mRNA
(D) mRNA from pre mRNA

525. Sigma and Rho factors are required for

(A) Replication (B) Transcription
(C) Translation (D) Polymerisation

526. The genine of ϕ×174 bacteriophage is interesting in that if contains

(A) No DNA
(B) DNA with uracil
(C) Single stranded DNA
(D) Triple standard DNA

527. Okasaki fragments are small bits of

(A) RNA
(B) DNA
(C) DNA with RNA heads
(D) RNA with DNA heads

528. In addition to the DNA of nucleus there DNA is

(A) Mitochondrian
(B) Endoplasmic reticulum
(C) Golgi apparatus
(D) Plasma membrane

529. The mitochondrial DNA is

(A) Like the nuclear DNA in structure
(B) Single stranded, linear
(C) Double stranded, circular
(D) Single stranded, circular

530. A synthetic RNA having the sequence of UUUUUU (Poly U) will give a protein having poly _____.

(A) Alamine (B) Phenyl alanine
(C) Glycine (D) Methionine

531. Lac operon of E. coli contains _____ is continuity.

(A) Regulator and operator genes only
(B) Operator and structural genes only
(C) Regular and structural genes only
(D) Regulator, operator and structural genes

532. A mRNA of eukaryotes can code for

(A) Only one polypeptide
(B) Two polypeptides
(C) Three polypeptides
(D) Five polypeptides

533. mRNA of prokaryotes can code for

(A) More than one polypeptide
(B) Only one polypeptide
(C) Many exons and introns
(D) Introns only

534. DNA directed RNA polymerase is

(A) Replicase
(B) Transcriptase
(C) Reverse transcriptase
(D) Polymerase III

535. RNA directed DNA polymerase is

(A) Replicase
(B) Transcriptase
(C) Reversetranscriptase
(D) Polymerase–III

Q536. RNA synthesis requires

(A) RNA primer (B) RNA template
(C) DNA template (D) DNA primer

537. The mRNA ready for protein synthesis has the _____ cap.

(A) ATP (B) CTP
(C) GTP (D) UTP

538. mRNA ready for protein synthesis has the poly _____ toil.

(A) G (B) A
(C) U (D) C

539. The codon for phenyl Alanine is

(A) AAA (B) CCC
(C) GGG (D) UUU

540. Blue print for genetic information residues in

(A) mRNA (B) tRNA
(C) rRNA (D) DNA

541. Genes are

(A) RNA (B) DNA
(C) lipoproteins and (D) Chromoproteins

542. Codons are in

(A) DNA (B) mRNA
(C) tRNA (D) rRNA

543. The genetic code operates via

(A) The protein moiety of DNA
(B) The base sequences of DNA
(C) The nucleotide sequence of mRNA
(D) The base sequence of tRNA

544. Urine bases with methyl substituents occurring in plants are

(A) Caffeine (B) Theophylline
(C) Theobromine (D) All of these

545. Genetic information in human beings is stored in

(A) DNA (B) RNA
(C) Both (A) and (B) (D) None of these

546. All following are naturally occurring nucleotides except

(A) Cyclic AMP
(B) ATP
(C) DNA
(D) Inosine monophosphate

547. If the amino group and a carboxylic group of the amino acid are attached to same carbon atom, the amino acid is called as

(A) Alpha (B) Beta
(C) Gamma (D) Epsilon

548. If in a nucleic acid there are more than 8000 nucleotides it is most likely

(A) RNA (B) DNA
(C) Both (A) and (B) (D) None of these

549. Genetic information in human beings is stored in

(A) RNA (B) DNA
(C) Both (A) and (B) (D) mRNA

550. In RNA, apart from ribose and phosphate, all following are present except

(A) Adenine (B) Guanine
(C) Thymine (D) Cytosine

551. Which of the following gives a positive Ninhydrin test?

(A) Reducing sugar (B) Triglycerides
(C) α-amino acids (D) Phospholipids

552. A Gene is

(A) A single protein molecule
(B) A group of chromosomes
(C) An instruction for making a protein molecule
(D) A bit of DNA molecule

553. In DNA, genetic information is located in

(A) Purine bases
(B) Pyrimidine bases
(C) Purine and pyrimidine bases
(D) sugar

554. Which one of the following is not a constituent of RNA?

(A) Deoxyribose (B) Uracil
(C) Adenine (D) Thymine

555. Which of the following are nucleo proteins?

(A) Protamines
(B) Histones
(C) Deoxy and Ribo nucleo proteins
(D) All of these

556. The total RNA in cell tRNA constitutes

(A) 1–10% (B) 10–20%
(C) 30–50% (D) 50–80%

557. Unit of genetic information:

(A) DNA (B) RNA
(C) Cistron (D) None of these

558. Anticodon sequence are seen in

(A) tRNA and transcribed DNA strand
(B) tRNA and complementary DNA strand
(C) mRNA
(D) mRNA and complementary DNA strand

559. cAMD is destroyed by

(A) Adenylate cyclase
(B) Phosphodiesterase
(C) Synthetase phosphatase
(D) Synthetase kinase

560. Restriction enzymes have been found in

(A) Humans (B) Birds
(C) Bacteria (D) Bacteriophase

561. Sulphur is not present in

(A) Thiamine (B) Lipic acid
(C) Thymine (D) Biotin

562. Which one of the following binds to specific nucleotide sequences?

(A) RNA polymerase (B) Repressor
(C) Inducer (D) Restriction

563. Using written convertion which one of the following sequences is complimentary to TGGCAGCCT?

(A) ACC GTC GGA (B) ACC GUC GGA
(C) AGG CTG CCA (D) TGG CTC GGA

564. Ribosomes similar to those of bacterial found in

(A) Plant nucei
(B) Cardiac muscle cytoplasm
(C) Liver endoplasmic reticulum
(D) Neuronal cytoplasm

565 The mechanism of synthesis of DNA and RNA are similar in all the following ways except

(A) They involve release of pyrophosphate from each nucleotide added
(B) They require activated nucleotide precursor and Mg^{2+}
(C) The direction of synthesis is $5' \rightarrow 3'$
(D) They require a primer

566. Template-directed DNA synthesis occurs in all the following except

(A) The replication fork
(B) Polymerase chain reaction
(C) Growth of RNA tumor viruses
(D) Expression of oneogenes

567. Which one of the following statements correctly describes eukaryotic DNA?

(A) They involve release of pyrophosphate from each nucleotide precussor and Mg^{2+}
(B) The direction of synthesis is
(C) They require a primer $5' \rightarrow 3'$
(D) None of these

568. Which one of the following causes frame shift mutation?

(A) Transition
(B) Transversion
(C) Deletion
(D) Substitution of purine to pyrimidine

569. Catabolism of thymidylate gives

(A) α-alanine
(B) β-alanine
(C) α-aminoisobutyrate
(D) β-aminoisobutyrate

570. Glycine gives _____ atoms of purine.

(A) C_2, C_3 (B) C_4, C_5 and N_7
(C) C_4, C_5 and N_9 (D) C_4, C_6 and N_7

571. A common substrate of HGPRTase, APRTase and PRPP glutamyl amidotransferase is

(A) Ribose 5 phosphate
(B) Phosphoribosyl pyrophosphate
(C) Hypoxanthine
(D) Adenosine

572. Carbon 6-of purine skeleton comes from

(A) Atmospheric CO_2
(B) 1 carbon carried by folate
(C) Betoine
(D) Methionine

573. Uric acid is the catabolic end product of

(A) Porphyrine (B) Purines
(C) Pyrimidines (D) Pyridoxine

574. Diphenylamine method is employed in the quantitation of

(A) Nucleic acid (B) RNA
(C) DNA (D) Proteins

575. Orcinol method is employed in the quantitation of

(A) Nucleic acid (B) DNA
(C) RNA (D) Proteins

576. Nucleic acid show strong absorption at one of the wavelength:

(A) 280 nm (B) 220 nm
(C) 360 nm (D) 260 nm

577. tRNA has

(A) Clover leaf structure
(B) anticodon arm
(C) poly 'A' tay 3'
(D) Cap at 5' end

578. Which one of the following contributes nitrogen atoms to both purine and pyrimidine rings?

(A) Aspartate
(B) Carbanoyl phosphate
(C) Carbondioxide
(D) Tetrahydrofolate

579. The four nitrogen atoms of purines are derived from

(A) Urea and NH_3
(B) NH_3, Glycine and Glutamate
(C) NH_3, Asparate and Glutamate
(D) Aspartate, Glutamine and Glycine

580. A drug which prevents uric acid synthesis by inhibiting the enzyme Xanthine oxidase is

(A) Aspirin (B) Allopurinal
(C) Colchicine (D) Phenyl benzoate

581. Glycine contributes to the following C and N of purine nucleus:

(A) C_1, C_2 and N_7 (B) C_8, C_8 and N_9
(C) C_4, C_5 and N_7 (D) C_4, C_5 and N_9

582. Insoinic acid is the biological precursor of

(A) Cytosine and Uric acid
(B) Adenylve acid and Glucine floc acid
(C) Orotic acid and Uridylic acid
(D) Adenosine acid Thymidine

583. The probable metabolic defect in gents is

(A) A defect in excretion of uric acid by kidney
(B) An overproduction of pyrimidines
(C) An overproduction of uric acid
(D) Rise in calcium leading to deposition of calcium urate

584. In humans, the principal break down product of purines is

(A) NH_3 (B) Allantin
(C) Alanine (D) Uric acid

585. A key substance in the committed step of pyrimidines biosynthesis is

(A) Ribose-5-phosphate
(B) Carbamoyl phosphate
(C) ATP
(D) Glutamine

586. In humans, the principal metabolic product of pyrimidines is

(A) Uric acid (B) Allantoin
(C) Hypoxanthine (D) β-alanine

587. In most mammals, except primates, uric acid is metabolized by

(A) Oxidation to allantoin
(B) Reduction to NH_3
(C) Hydrolysis to allantoin
(D) Hydrolysis to NH_3

588. Two nitrogen of the pyrimidines ring are obtained from

(A) Glutamine and Carbamoyl-p
(B) Asparate and Carbamoyl-p
(C) Glutamate and NH_3
(D) Glutamine and NH_3

589. All are true about lesch-nyhan syndrome except

(A) Produces self-mutilation
(B) Genetic deficiency of the enzyme
(C) Elevated levels of uric acid in blood
(D) Inheritance is autosomal recessive

590. Synthesis of GMP and IMP requires the following:

(A) NH_3 NAD^+, ATP
(B) Glutamine, NAD^+, ATP
(C) NH_3, GTP, $NADP^+$
(D) Glutamine, GTP, $NADP^+$

591. Which pathway is correct for catabolism of purines to form uric acid?

(A) Guanylate→Adenylate→Xanthine→hypoxanthine→Uric acid
(B) Guanylate→inosinate→Xanthine→hypoxanthine→Uric acid
(C) Adenylate→Inosinate→Xanthine hypoxanthine→Uric acid
(D) Adenylate→Inosinate→hypoxanthine Xanthine→Uric acid

592. Polysemes do not contain

(A) Protein (B) DNA
(C) mRNA (D) rRNA

593. The formation of a peptide bond during the elongation step of protein synthesis results in the splitting of how many high energy bonds?

(A) 1 (B) 2
(C) 3 (D) 4

594. Translocase is an enzyme required in the process of

(A) DNA replication
(B) RNA synthesis
(C) Initiation of protein synthesis
(D) Elongation of peptides

595. Nonsense codons bring about

(A) Amino acid activation
(B) Initiation of protein synthesis
(C) Termination of protein synthesis
(D) Elongation of polypeptide chains

596. Which of the following genes of the E.coli "Lac operon" codes for a constitutive protein?

(A) The 'a' gene (B) The 'i' gene
(C) The 'c' gene (D) The 'z' gene

597. In the process of transcription, the flow of genetic information is from

(A) DNA to DNA (B) DNA to protein
(C) RNA to protein (D) DNA to RNA

598. The anticodon region is an important part of the structure of

(A) rRNA (B) tRNA
(C) mRNA (D) hrRNA

599. The region of the Lac operon which must be free from structural gene transcription to occur is

(A) The operator locus
(B) The promoter site
(C) The 'a' gene
(D) The 'i' gene

600. Another name for reverse transcriptase is

(A) DNA dependent DNA polymerase
(B) DNA dependent RNA polymerase
(C) RNA dependent DNA polymerase
(D) RNA dependent RNA polymerase

601. In the 'lac operon' concept, which of the following is a protein?

(A) Operator (B) Repressor
(C) Inducer (D) Vector

602. Degeneracy of the genetic code denotes the existence of

(A) Base triplets that do not code for any amino acids
(B) Codons consisting of only two bases
(C) Codons that include one or more of the unusual bases
(D) Multiple codons for a single amino acid

603. The normal function of *restriction endonucleases* is to

(A) Excise introns from hrRNA
(B) Polymerize nucleotides to form RNA
(C) Remove primer from okazaki fragments
(D) Protect bacteria from foreign DNA

604. In contrast to Eukaryotic mRNA, prokaryotic mRNA is characterized by

(A) Having 7-methyl guanosine triphosphate at the 5′ end
(B) Being polycystronic
(C) Being only monocystronic
(D) Being synthesized with introns

605. DNA *ligase* of E. coli requires which of the following co-factors?

(A) FAD (B) NAD^+
(C) $NADP^+$ (D) NADH

606. Which of the following is transcribed during repression?

(A) Structural gene (B) Promoter gene
(C) Regulator gene (D) Operator gene

607. mRNA is complementary copy of

(A) 5′-3′ strand of DNA^+
(B) 3′-5′ strand of DNA
(C) Antisense strand of DNA
(D) tRNA

608. Synthesis of RNA molecule is terminated by a signal which is recognised by

(A) α-factor (B) β-factor
(C) δ-factor (D) ρ

609. The binding of prokaryotic DNA dependent RNA polymerase to promoter sits of genes is inhibited by the antibiotic:

(A) Streptomycin (B) Rifamcin
(C) Aueromycin (D) Puromycin

610. In E. coli the chain initiating amino acid in protein synthesis is

(A) N-formyl methionine (B) Methionine
(C) Serine (D) Cysteine

611. Amanitin the mushroom poison inhibits

(A) Glycoprotein synthesis
(B) ATP synthesis
(C) DNA synthesis
(D) mRNA synthesis

612. How many high-energy phosphate bond equivalents are required for amino acid activation in protein synthesis?

(A) One (B) Two
(C) Three (D) Four

613. Translation results in the formation of

(A) mRNA (B) tRNA
(C) rRNA (D) A protein molecule

614. Elongation of a peptide chain involves all the following except

(A) mRNA (B) GTP
(C) Formyl-Met-tRNA (D) Tu, TS and G factors

615. The 'rho' (ρ) factor is involved

(A) To increase the rate of RNA synthesis
(B) In binding catabolite repressor to the promoter region
(C) In proper termination of transcription
(D) To allow proper initiation of transcriptide

616. In the biosynthesis of c-DNA, the joining enzyme *ligase* requires

(A) GTP (B) ATP
(C) CTP (D) UTP

617. Which one of the following binds to specific nucleotide sequences that are upstream and most distant from the start site?

(A) RNA polymerase (B) Repressor
(C) Inducer (D) Restriction

618. Using written convention which one of the following sequences is complimentary to TGGCAGCCT?

(A) ACCGTCGGA (B) ACCGUCGGA
(C) AGGCTGCCA (D) TGGCTCGGA

619. Ribosomes similar to those of bacteria found in

(A) Plant nuclei
(B) Cardiac muscle cytoplasm
(C) Liver endoplasmic reticulum
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621. Template-directed DNA synthesis occurs in all the following except

(A) The replication fork
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(C) Growth of RNA tumor viruses
(D) Expression of oncogenes

ANSWERS

1. B	2. B	3. A	4. C	5. A	6. C
7. B	8. D	9. C	10. D	11. A	12. A
13. A	14. D	15. B	16. A	17. C	18. C
19. A	20. A	21. B	22. C	23. C	24. D
25. C	26. A	27. C	28. B	29. C	30. A
31. D	32. A	33. B	34. A	35. A	36. C
37. C	38. A	39. B	40. D	41. C	42. C
43. B	44. C	45. D	46. B	47. A	48. C
49. B	50. A	51. D	52. B	53. B	54. D
55. D	56. A	57. D	58. A	59. A	60. D
61. B	62. C	63. A	64. A	65. A	66. A
67. A	68. A	69. B	70. A	71. A	72. A
73. C	74. B	75. C	76. A	77. C	78. D
79. B	80. A	81. C	82. A	83. A	84. A
85. A	86. D	87. A	88. B	89. A	90. C
91. B	92. B	93. A	94. A	95. A	96. A
97. B	98. B	99. D	100. A	101. B	102. A
103. B	104. B	105. A	106. B	107. C	108. A
109. D	110. C	111. D	112. A	113. B	114. A
115. B	116. A	117. D	118. A	119. A	120. C
121. A	122. D	123. B	124. C	125. A	126. A
127. D	128. C	129. A	130. A	131. B	132. B
133. D	134. A	135. A	136. D	137. B	138. B
139. A	140. D	141. B	142. D	143. C	144. B
145. D	146. B	147. B	148. B	149. D	150. D
151. D	152. A	153. C	154. A	155. B	156. C
157. B	158. A	159. A	160. A	161. C	162. C
163. C	164. C	165. D	166. C	167. A	168. C
169. C	170. D	171. B	172. B	173. C	174. D
175. D	176. A	177. B	178. D	179. D	180. C
181. B	182. B	183. C	184. B	185. A	186. D
187. B	188. C	189. D	190. A	191. B	192. C
193. A	194. D	195. D	196. A	197. D	198. C
199. A	200. C	201. D	202. C	203. B	204. D
205. C	206. D	207. B	208. C	209. C	210. D
211. B	212. C	213. D	214. C	215. B	216. B
217. D	218. B	219. D	220. A	221. A	222. D
223. A	224. C	225. A	226. B	227. C	228. C
229. D	230. B	231. C	232. A	233. C	234. A
235. B	236. A	237. C	238. C	239. D	240. D
241. B	242. C	243. D	244. C	245. C	246. B
247. A	248. C	249. A	250. D	251. A	252. C

253. D	254. D	255. C	256. C	257. C	258. D
259. D	260. A	261. B	262. B	263. A	264. A
265. C	266. D	267. B	268. C	269. B	270. D
271. C	272. B	273. A	274. C	275. A	276. C
277. A	278. B	279. C	280. C	281. D	282. D
283. C	284. D	285. C	286. B	287. A	288. A
289. D	290. B	291. B	292. C	293. B	294. A
295. C	296. A	297. D	298. C	299. C	300. D
301. B	302. C	303. B	304. A	305. C	306. D
307. D	308. B	309. B	310. C	311. A	312. C
313. A	314. B	315. B	316. A	317. A	318. D
319. D	320. A	321. C	322. C	323. C	324. C
325. A	326. D	327. A	328. B	329. C	330. D
331. C	332. B	333. A	334. D	335. D	336. C
337. A	338. C	339. C	340. C	341. C	342. D
343. A	344. A	345. B	346. D	347. C	348. B
349. B	350. D	351. A	352. B	353. D	354. C
355. A	356. B	357. D	358. A	359. D	360. B
361. B	362. A	363. A	364. C	365. C	366. C
367. D	368. D	369. B	370. B	371. B	372. C
373. B	374. D	375. C	376. B	377. B	378. D
379. D	380. B	381. D	382. D	383. D	384. C
385. B	386. B	387. C	388. D	389. C	390. D
391. C	392. D	393. A	394. C	395. D	396. A
397. B	398. B	399. C	400. A	401. D	402. B
403. D	404. A	405. D	406. C	407. D	408. C
409. D	410. A	411. C	412. B	413. A	414. C
415. D	416. B	417. C	418. A	419. D	420. C
421. C	422. D	423. D	424. D	425. C	426. C
427. C	428. C	429. D	430. C	431. B	432. C
433. D	434. C	435. C	436. B	437. D	438. C
439. B	440. C	441. C	442. A	443. C	444. C
445. D	446. D	447. D	448. C	449. A	450. D
451. D	452. B	453. D	454. D	455. B	456. C
457. A	458. D	459. B	460. A	461. C	462. D
463. C	464. B	465. A	466. C	467. B	468. D
469. A	470. A	471. B	472. D	473. D	474. C
475. C	476. D	477.A	478. A	479. C	480. C
481. D	482. D	483. C	484. C	485. B	486. D
487. A	488. B	489. D	490. A	491. B	492. B
493. A	494. D	495. B	496. D	497. C	498. D
499. C	500. C	501. A	502. B	503. D	504. D
505. C	506. C	507. A	508. C	509. C	510. B

511. B	512. A	513. D	514. B	515. D	516. B
517. D	518. C	519. B	520. B	521. B	522. C
523. C	524. B	525. C	526. C	527. C	528. A
529. C	530. B	531. D	532. A	533. A	534. B
535. C	536. C	537. C	538. B	539. D	540. D
541. B	542. B	543. C	544. D	545. A	546. C
547. A	548. B	549. B	550. C	551. C	552. D
553. C	554. A	555. D	556. B	557. C	558. A
559. B	560. C	561. C	562. A	563. A	564. A
565. A	566. C	567. C	568. C	569. D	570. B
571. B	572. A	573. A	574. C	575. C	576. D
577. A	578. A	579. D	580. B	581. C	582. B
583. C	584. D	585. B	586. D	587. A	588. B
589. B	590. B	591. D	592. B	593. B	594. D
595. C	596. B	597. D	598. B	599. A	600. C
601. B	602. B	603. D	604. A	605. B	606. C
607. B	608. D	609. B	610. A	611. D	612. B
613. D	614. C	615. C	616. B	617. A	618. A
619. A	620. D	621. C			

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CHAPTER 10

WATER & ELECTROLYTE BALANCE

1. The total body water in various subjects is relatively constant when expressed as percentage of the lean body mass and is about

(A). 30% (B) 40%
(C) 50% (D) 70%

2.. The percentage of water contained in the body of an individual is less because of

(A) High fat content (B) Low fat content
(C) High protein content (D) Low protein content

3. In intracellular compartment the fluid present in ml/kg body weight is about

(A) 100 (B) 200
(C) 200 (D) 330

4. In extra cellular compartment, the fluid present in ml/kg of body weight is about

(A) 120 (B) 220
(C) 270 (D) 330

5. Fluid present in dense connective tissue and cartilage in ml/kg body weight is about

(A) 10 (B) 20
(C) 45 (D) 55

6. The total body water in ml/kg body weight in average normal young adult male is about

(A) 200 (B) 400
(C) 600 (D) 1000

7. The fluid present in bones which can not be exchanged readily because of relative avascularity is about

(A) 20 ml/kg (B) 25 ml/kg
(C) 45 ml/kg (D) 60 ml/kg

8. Water derived in gm from complete oxidation of each gm of carbohydrate is about

(A) 0.15 (B) 0.25
(C) 0.35 (D) 0.55

9. The oxidation of 100 gm of fat yields

(A) 50 gm water (B) 107 gm water
(C) 150 gm water (D) 200 gm water

10. Each gm of protein on complete oxidation yields

(A) 0.21 gm water (B) 0.31 gm water
(C) 0.41 gm water (D) 0.51 gm water

11. The daily total body water derived from oxidation of food stuffs is about

(A) 100 ml (B) 300 ml
(C) 600 ml (D) 1000 ml

12. The daily water allowance for normal infant is about

(A) 100–200 ml (B) 250–300 ml
(C) 330–1000 ml (D) 1000–2000 ml

13. The daily water allowance for normal adult (60 kg) is about

(A) 200–600 ml (B) 500–800 ml
(C) 800–1500 ml (D) 1800–2500 ml

14. Insensible loss of body water of normal adult is about

(A) 50–100 ml (B) 100–200 ml
(C) 300–500 ml (D) 600–1000 ml

15. The predominant cation of plasma is

(A) Na^+ (B) K^+
(C) Ca^+ (D) Mg^{++}

16. The predominant action of plasma is

(A) HCO_3– (B) Cl–
(C) HPO_4– – (D) SO_4 – –

17. Vasopressin (ADH)

(A) Enhance facultative reabsorption of water
(B) Decreases reabsorption of water
(C) Increases excretion of calcium
(D) Decreases excretion of calcium

18. Enhanced facultative reabsorption of water by Vasopressin is mediated by

(A) Cyclic AMP (B) Ca^{++}
(C) Cyclic GMP (D) Mg^{++}

19. Action of kinins is to

(A) Increase salt excretion
(B) Decrease salt retention
(C) Decrease water retention
(D) Increase both salt and water excretion

20. The activity of kinins is modulated by

(A) Prostaglandins
(B) Ca^{++}
(C) Increased cAMP level
(D) Increased cGMP level

21. An important cause of water intoxication is

(A) Nephrogenic diabetes insipidus
(B) Renal failure
(C) Gastroenteritis
(D) Fanconi syndrome

22. Minimum excretory urinary volume for waste products elimination during 24 hrs is

(A) 200–300 ml (B) 200–400 ml
(C) 500–600 ml (D) 800 ml

23. In primary dehydration

(A) Intracellular fluid volume is reduced
(B) Intracellular fluid volume remains normal
(C) Extracellular fluid volume is much reduced
(D) Extracellular fluid volume is much increased

24. An important cause of secondary dehydration is

(A) Dysphagia
(B) Oesophageal varices
(C) Oesophageal varices
(D) Gastroenteritis

25. Important finding of secondary dehydration is

(A) Intracellular oedema
(B) Cellular dehydration
(C) Thirst
(D) Muscle cramps

26. Urine examination in secondary dehydration shows

(A) Ketonuria
(B) Low specific gravity
(C) High specific gravity
(D) Albuminuria

27. The total calcium of the human body is about

(A) 100–150 g (B) 200–300 g
(C) 1–1.5 kg (D) 2–3 kg

28. Daily requirement of calcium for normal adult human is

(A) 100 mg (B) 800 mg
(C) 2 g (D) 4 g

29. Normal total serum calcium level varies between

(A) 4–5 mg (B) 9–11 mg
(C) 15–20 mg (D) 50–100 mg

30. The element needed in quantities greater than 100 mg for human beings is

(A) Calcium (B) Zinc
(C) Selenium (D) Cobalt

31. The mineral present in the human body in larger amounts than any other cation is

(A) Sodium (B) Calcium
(C) Potassium (D) Iron

32. The percentage of the total body calcium present in bones is

(A) 1 (B) 11
(C) 55 (D) 99

33. The percentage of calcium present in extracellular fluid is

(A) 1 (B) 5
(C) 10 (D) 50

34. The physiologically active form of calcium is

(A) Protein bond
(B) Ionised
(C) Complexed with citrate
(D) Complexed with carbonate

35. The normal concentration of calcium in C.S.F is

(A) 1.5–2.5 mg/100 ml
(B) 2.5–4 mg/100 ml
(C) 4.5–5 mg/100 ml
(D) 9–10 mg/100 ml

36. Absorption of calcium is increased on a

(A) High protein diet (B) Low protein diet
(C) High fat diet (D) Low fat diet

37. Calcium absorption is interfered by

(A) Protein in diet
(B) Phytic acid in cereals
(C) Alkaline intestinal pH
(D) Vitamin D

38. Calcium absorption is increased by

(A) Vitamin D (B) Vitamin C
(C) Vitamin K (D) Vitamin E

39. In serum product of Ca x p (in mg/100ml) in children is normally

(A) 20 (B) 30
(C) 50 (D) 60

40. In ricket, the product of Ca x p (in mg/100 ml) in serum is below

(A) 30 (B) 50
(C) 70 (D) 100

41. In man, the amount of calcium in gms filtered in 24 hrs period by the renal glomeruli is

(A) 5 (B) 10
(C) 15 (D) 20

42. The percentage of the calcium eliminated in feces is

(A) 10–20 (B) 30–40
(C) 50–60 (D) 70–90

43. The maximal renal tubular reabsorptive capacity for calcium (Tmca) in mg/min is about

(A) 1.5 ± 0.1 (B) 4.99 ± 0.21
(C) 5.5 ± 1.2 (D) 10.2 ± 2.2

44. Renal ricket is caused by renal tubular defect (usually inherited) which interferes with reabsorption of

(A) Calcium (B) Phosphorous
(C) Sodium (D) Chloride

45. After operative removal of the parathyroid glands resulting into hypoparathyroidism the concentration of the serum calcium may drop below

(A) 11 mg (B) 10 mg
(C) 9 mg (D) 7 mg

46. One of the principal cations of soft tissue and body fluids is

(A) Mg (B) S
(C) Mn (D) Co

47. The normal concentration of magnesium in whole blood is

(A) 0–1 mg/100 ml (B) 1–2 mg/100 ml
(C) 2–4 mg/100 ml (D) 4–8 mg/100 ml

48. The normal concentration of magnesium in C.S.F is about

(A) 1 mg/100 ml (B) 3 mg/100 ml
(C) 5 mg/100 ml (D) 8 mg/100 ml

49. The magnesium content of muscle is about

(A) 5 mg/100 ml (B) 10 mg/100 ml
(C) 21 mg/100 ml (D) 50 mg/100 ml

50. Intestinal absorption of magnesium is increased in

(A) Calcium deficient diet
(B) High calcium diet
(C) High oxalate diet
(D) High phytate diet

51. Deficiency of magnesium may occur with

(A) Alcoholism
(B) Diabetes mellitus
(C) Hypothyroidism
(D) Advanced renal failure

52. Hypermagnesemia may be observed in

(A) Hyperparathyroidism
(B) Diabetes mellitus
(C) Kwashiorkar
(D) Primary aldosteronism

53. Na^+/K^+-ATPase along with ATP requires

(A) Ca (B) Mn
(C) Mg (D) Cl

54. The principal cation in extracellular fluid is

(A) Sodium (B) Potassium
(C) Calcium (D) Magnesium

55. The normal concentration of sodium (in mg/100 ml) of human plasma is

(A) 100 (B) 200
(C) 250 (D) 330

56. A decrease in serum sodium may occur in

(A) Adrenocortical insufficiency
(B) Hypoparathyroidism
(C) Hyperparathyroidism
(D) Thyrotoxicosis

57. Hypernatremia may occur in

(A) Diabetes insipidus
(B) Diuretic medication
(C) Heavy sweating
(D) Kidney disease

58. The metabolism of sodium is regulated by the hormone:

(A) Insulin (B) Aldosterone
(C) PTH (D) Somatostatin

59. The principal cation in intracellular fluid is

(A) Sodium (B) Potassium
(C) Calcium (D) Magnesium

60. The normal concentration of potassium in whole blood is

(A) 50 mg/100 ml (B) 100 mg/100 ml
(C) 150 mg/100 ml (D) 200 mg/100 ml

61. The normal concentration of potassium in human plasma in meq/l is about

(A) 1 (B) 2
(C) 3 (D) 5

62. The normal concentration of potassium in cells in ng/100 ml is about

(A) 100 (B) 200
(C) 350 (D) 440

63. Potassium content of nerve tissue in mg/100 ml is about

(A) 200 (B) 330
(C) 400 (D) 530

64. Potassium content of muscle tissue in mg/100 ml is about

(A) 50–100 (B) 100–150
(C) 250–400 (D) 150–200

65. One of the symptoms of low serum potassium concentration includes

(A) Muscle weakness
(B) Confusion
(C) Numbness
(D) Tingling of extremities

66. Potassium metabolism is regulated by the hormone:

(A) Aldosterone (B) PTH
(C) Somatostatin (D) Estrogen

67. A high serum potassium, accompanied by a high intracellular potassium occurs in

(A) Adrenal insufficiency
(B) Any illness
(C) Gastrointestinal losses
(D) Cushing's syndrome

68. Hypokalemia occurs in

(A) Cushing's syndrome
(B) Addison's disease
(C) Renal failure
(D) Advanced dehydration

69. Cardiac arrest may occur due to over doses of

(A) Sodium (B) Potassium
(C) Zinc (D) Magnesium

70. The normal concentration of chloride in mg/100 ml of whole blood is about

(A) 200 (B) 250
(C) 400 (D) 450

71. The normal concentration of chloride in mg/100 ml of plasma is about

(A) 100 (B) 200
(C) 365 (D) 450

72. The normal concentration of chlorine in mg/100 ml of C.S.F is about

(A) 200 (B) 250
(C) 300 (D) 440

73. Hypokalemia with an accompanying hypochloremic alkalosis may be observed in

(A) Cushing's syndrome (B) Addison's disease
(C) Hyptothyroidism (D) Malnutrition

74. Hypercholremia is associated with

(A) Hyponatremia (B) Hypernatremia
(C) Metabolic alkalosis (D) Respiratory acidosis

75. The exclusive function of iron in the body is confined to the process of

(A) Muscular contraction
(B) Nerve excitation
(C) Cellular respiration
(D) Blood coagulation

76. The normal pH of the blood is

(A) 7.0 (B) 7.1
(C) 7.2 (D) 7.4

77. The normal concentration of bicarbonate in blood is

(A) 21 meq/L (B) 24 meq/L
(C) 26 meq/L (D) 30 meq/L

78. At the pH of blood 7.4, the ratio between the carbonic acid and bicarbonate fractions is

(A) 1 : 10 (B) 1 : 20
(C) 1 : 30 (D) 1 : 40

79. A 0.22 M solution of lactic acid (pK_a 3.9) was found to contain 0.20 M in the dissociated form and 0.02 M undissociated form, the pH of the solution is

(A) 2.9 (B) 3.3
(C) 4.9 (D) 5.4

80. Important buffer system of extracellular fluid is

(A) Bicarbonate/carbonic acid
(B) Disodium hydrogen phosphate/sodium dihydrogen phosphate
(C) Plasma proteins
(D) Organic Phosphate

81. The pH of body fluids is stabilized by buffer systems. The compound which will be the most effective buffer at physiologic pH is

(A) Na_2HPO_4 pK_a = 12.32
(B) Na_2HPO_4 pK_a=7.21
(C) NH_4OH pK_a = 7.24
(D) Citric acid pK_a = 3.09

82. The percentage of CO_2 carrying capacity of whole blood by hemoglobin and oxyhemoglobin is

(A) 20 (B) 40
(C) 60 (D) 80

83. The normal serum CO_2 content is

(A) 18–20 meq/L (B) 24–29 meq/L
(C) 30–34 meq/L (D) 35–38 meq/L

84. The carbondioxide carrying power of the blood residing within the red cells is

(A) 50% (B) 60%
(C) 85% (D) 100%

85. Within the red blood cells the buffering capacity contributed by the phosphates is

(A) 5% (B) 10%
(C) 20% (D) 25%

86. The normal ratio between the alkaline phosphate and acid phosphate in plasma is

(A) 2 : 1 (B) 1 : 4
(C) 20 : 1 (D) 4 : 1

87. The oxygen dissociation curve for hemoglobin is shifted to the right by

(A) Decreased O_2 tension
(B) Decreased CO_2 tension
(C) Increased CO_2 tension
(D) Increased pH

88. Bohr effect is

(A) Shifting of oxyhemoglobin dissociation curve to the right
(B) Shifting of oxyhemoglobin dissociation curve to the left
(C) Ability of hemoglobin to combine with O_2
(D) Exchange of chloride with carbonate

89. Chloride shift is

(A) H ions leaving the RBC in exchange of Cl^-
(B) Cl^- leaving the RBC in exchange of bicarbonate
(C) Bicarbonate ion returns to plasma and exchanged with chloride which shifts into the cell
(D) Carbonic acid to the plasma

90. Of the total body water, intracellular compartment contains about

(A) 50% (B) 60%
(C) 70% (D) 80%

91. Osmotically active substances in plasma are

(A) Sodium (B) Chloride
(C) Proteins (D) All of these

92. Osmotic pressure of plasma is

(A) 80–100 milliosmole/litre
(B) 180–200 milliosmole/litre
(C) 280–300 milliosmole/litre
(D) 380–400 milliosmole/litre

93. Contribution of albumin to colloid osmotic pressure of plasma is about

(A) 10% (B) 50%
(C) 80% (D) 90%

94. The highest concentration of proteins is present in

(A) Plasma (B) Interstitial fluid
(C) Interstitial fluid (D) Transcellular fluid

95. Oncotic pressure of plasma is due to

(A) Proteins (B) Chloride
(C) Sodium (D) All of these

96. Oncotic pressure of plasma is about

(A) 10 mm of Hg (B) 15 mm of Hg
(C) 25 mm of Hg (D) 50 mm of Hg

97. Oedema can occur when

(A) Plasma Na and Cl are decreased
(B) Plasma Na and Cl are increased
(C) Plasma proteins are decreased
(D) Plasma proteins are increased

98. Colloid osmotic pressure of intracellular fluid is

(A) Equal to that of plasma
(B) More than that of plasma
(C) More than that of plasma
(D) Nearly zero

99. The water produced during metabolic reactions in an adult is about

(A) 100 ml/day (B) 300 ml/day
(C) 500 ml/day (D) 700 ml/day

100. The daily water loss through gastrointestinal tract in an adult is about

(A) Less than 100 ml/day
(B) 200 ml/day
(C) 300 ml/day
(D) 400 ml/day

101. Recurrent vomiting leads to loss of

(A) Potassium (B) Chloride
(C) Bicarbonate (D) All of these

102. Obligatory reabsorption of water

(A) Is about 50% of the total tubular reabsorption of water
(B) Is increased by antidiuretic hormone
(C) Occurs in distal convoluted tubules
(D) Is secondary to reabsorption of solutes

103. Antidiuretic hormone

(A) Is secreted by hypothalamus
(B) Secretion is increased when osmolality of plasma decreases
(C) Increases obligatory reabsorption of water
(D) Acts on distal convoluted tubules and collecting ducts

104. Urinary water loss is increased in

(A) Diabetes mellitus
(B) Diabetes insipidus
(C) Chronic glomerulonephritis
(D) All of these

105. Diabetes insipidus results from

(A) Decreased insulin secretion
(B) Decreased ADH secretion
(C) Decreased aldosterone secretion
(D) Unresponsiveness of osmoreceptors

106. Thiazide diuretics inhibit

(A) Carbonic anhydrase
(B) Aldosterone secretion
(C) ADH secretion
(D) Sodium reabsorption in distal tubules

107. Furosemide inhibits reabsorption of sodium and chloride in

(A) Proximal convoluted tubules
(B) Loop of Henle
(C) Distal convoluted tubules
(D) Collecting ducts

108. A diuretic which is an aldosterone antagonist is

(A) Spironolactone (B) Ethacrynic acid
(C) Acetazolamide (D) Chlorothiazide

109. In a solution having a pH of 7.4, the hydrogen ion concentration is

(A) 7.4 nmol/L (B) 40 nmol/L
(C) 56 nmol/L (D) 80 nmol/L

110. At pH 7.4, the ratio of bicarbonate : dissolved CO_2 is

(A) 1 : 1 (B) 10 : 1
(C) 20 : 1 (D) 40 : 1

111. Quantitatively, the most significant buffer system in plasma is

(A) Phosphate buffer system
(B) Carbonic acid-bicarbonate buffer system
(C) Lactic acid-lactate buffer system
(D) Protein buffer system

112. In a solution containing phosphate buffer, the pH will be 7.4, if the ratio of monohydrogen phosphate : dihydrogen phosphate is

(A) 4 : 1 (B) 5 : 1
(C) 10 : 1 (D) 20 : 1

113. pK_a of dihydrogen phosphate is

(A) 5.8 (B) 6.1
(C) 6.8 (D) 7.1

114. Buffering action of haemoglobin is mainly due to its

(A) Glutamine residues
(B) Arginine residues
(C) Histidine residues
(D) Lysine residues

115. Respiratory acidosis results from

(A) Retention of carbon dioxide
(B) Excessive elimination of carbon dioxide
(C) Retention of bicarbonate
(D) Excessive elimination of bicarbonate

116. Respiratory acidosis can occur in all of the following except

(A) Pulmonary oedema
(B) Hysterical hyperventilation
(C) Pneumothorax
(D) Emphysema

117. The initial event in respiratory acidosis is

(A) Decrease in pH
(B) Increase in pCO_2
(C) Increase in plasma bicarbonate
(D) Decrease in plasma bicarbonate

118. Respiratory alkalosis can occur in

(A) Bronchial asthma
(B) Collapse of lungs
(C) Hysterical hyperventilation
(D) Bronchial obstruction

119. The primary event in respiratory alkalosis is

(A) Rise in pH
(B) Decrease in pCO_2
(C) Increase in plasma bicarbonate
(D) Decrease in plasma chloride

120. Anion gap is the difference in the plasma concentrations of

(A) (Chloride) – (Bicarbonate)
(B) (Sodium) – (Chloride)
(C) (Sodium + Potassium) – (Chloride + Bicarbonate)
(D) (Sum of cations) – (Sum of anions)

121. Normal anion gap in plasma is about

(A) 5 meq/L (B) 15 meq/L
(C) 25 meq/L (D) 40 meq/L

122. Anion gap is normal in

(A) Hyperchloraemic metabolic acidosis
(B) Diabetic ketoacidosis
(C) Lactic acidosis
(D) Uraemic acidosis

123. Anion gap is increased in

(A) Renal tubular acidosis
(B) Metabolic acidosis resulting from diarrhoea
(C) Metabolic acidosis resulting from intestinal obstruction
(D) Diabetic ketoacidosis

124. Anion gap in plasma is because

(A) Of differential distribution of ions across cell membranes
(B) Cations outnumber anions in plasma
(C) Anions outnumber cations in plasma
(D) Of unmeasured anions in plasma

125. Salicylate poisoning can cause

(A) Respiratory acidosis
(B) Metabolic acidosis with normal anion gap
(C) Metabolic acidosis with increased anion gap
(D) Metabolic alkalosis

126. Anion gap of plasma can be due to the presence of all the following except

(A) Bicarbonate (B) Lactate
(C) Pyruvate (D) Citrate

127. All the following features are found in blood chemistry in uncompensated lactic acidosis except

(A) pH is decreased
(B) Bicarbonate is decreased
(C) pCO_2 is normal
(D) Anion gap is normal

128. All the following statements about renal tubular acidosis are correct except

(A) Renal tubules may be unable to reabsorb bicarbonate
(B) Renal tubules may be unable to secrete hydrogen ions
(C) Plasma chloride is elevated
(D) Anion gap is decreased

129. All the following changes in blood chemistry can occur in severe diarrhoea except

(A) Decreased pH
(B) Decreased bicarbonate
(C) Increased pCO_2
(D) Increased chloride

130. During compensation of respiratory alkalosis, all the following changes occur except

(A) Decreased secretion of hydrogen ions by renal tubules
(B) Increased excretion of sodium in urine
(C) Increased excretion of bicarbonate in urine
(D) Increased excretion of ammonia in urine

131. Blood chemistry shows the following changes in compensated respiratory acidosis:

(A) Increased pCO_2
(B) Increased bicarbonate
(C) Decreased chloride
(D) All of these

132. Metabolic alkalosis can occur in

(A) Severe diarrhoea
(B) Renal failure
(C) Recurrent vomiting
(D) Excessive use of carbonic anhydrase inhibitors

133. Which of the following features are present in blood chemistry in uncompensated metabolic alkalosis except?

(A) Increased pH
(B) Increased bicarbonate
(C) Normal chloride
(D) Normal pCO_2

134. One joule is the energy required to

(A) Raise the temperature of 1 gm of water by 1°C
(B) Raise the temperature of 1 kg of water by 1°C
(C) Move a mass of 1 gm by 1 cm distance by a force of 1 Newton
(D) Move a mass of 1 kg by 1 m distance by a force of 1 Newton

135. Organic compound of small molecular size is

(A) Urea (B) Uric acid
(C) Creatinine (D) Phosphates

136. Organic substance of large molecular size is

(A) Starch (B) Insulin
(C) Lipids (D) Proteins

137. Body water is regulated by the hormone:

(A) Oxytocin (B) ACTH
(C) FSH (D) Epinephrine

138. Calcium is required for the activation of the enzyme:

(A) Isocitrate dehydrogenase
(B) Fumarase
(C) Succinate thiokinase
(D) ATPase

139. Cobalt is a constituent of

(A) Folic acid (B) Vitamin B_{12}
(C) Niacin (D) Biotin

140. Calcium absorption is inferred by

(A) Fatty acids (B) Amino acids
(C) Vitamin D (D) Vitamin B_{12}

141. The average of pH of urine is

(A) 5.6 (B) 6.0
(C) 6.4 (D) 7.0

ANSWERS

1. D	2. A	3. D	4. C	5. C	6. C
7. C	8. D	9. B	10. C	11. B	12. C
13. D	14. D	15. A	16. B	17. A	18. A
19. D	20. A	21. B	22. C	23. A	24. D
25. A	26. B	27. C	28. B	29. B	30. A
31. B	32. D	33. A	34. B	35. C	36. A
37. B	38. A	39. C	40. A	41. B	42. D
43. B	44. B	45. D	46. A	47. C	48. B
49. C	50. A	51. A	52. B	53. C	54. A
55. D	56. A	57. A	58. B	59. B	60. D
61. D	62. D	63. D	64. C	65. A	66. A
67. A	68. A	69. B	70. B	71. C	72. D
73. A	74. B	75. C	76. D	77. C	78. B
79. C	80. A	81. B	82. C	83. B	84. C
85. D	86. D	87. C	88. A	89. C	90. C
91. D	92. C	93. C	94. C	95. A	96. C
97. C	98. B	99. B	100. A	101. B	102. D
103. D	104. D	105. B	106. D	107. B	108. A
109. B	110. C	111. B	112. A	113. C	114. C
115. A	116. B	117. B	118. C	119. B	120. C
121. B	122. A	123. B	124. B	125. C	126. A
127. D	128. D	129. C	130. D	131. D	132. C
133. D	134. D	135. A	136. D	137. A	138. D
139. B	140. A	141. B			