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:

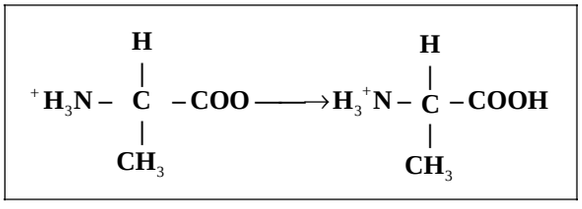
(A) Neutral (B) Positive
(C) Negative (D) Not predictable

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) $H_3^+N-\underset{CH_3}{\overset{H}{C}}-COO^-$

(C) $H_2N-\underset{CH_3}{\overset{H}{C}}-COO^-$ (D) $^+H_2N-\underset{CH_3}{\overset{H}{C}}-COO^-$

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 6th 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.