

CHAPTER 2

CARBOHYDRATES AND CARBOHYDRATE METABOLISM

- The general formula of monosaccharides is**
(A) $C_nH_{2n}O_n$ (B) $C_{2n}H_2O_n$
(C) $C_nH_2O_{2n}$ (D) $C_nH_{2n}O_{2n}$
- The general formula of polysaccharides is**
(A) $(C_6H_{10}O_5)_n$ (B) $(C_6H_{12}O_5)_n$
(C) $(C_6H_{10}O_6)_n$ (D) $(C_6H_{10}O_6)_n$
- The aldose sugar is**
(A) Glycerose (B) Ribulose
(C) Erythrulose (D) Dihydroxyacetone
- A triose sugar is**
(A) Glycerose (B) Ribose
(C) Erythrose (D) Fructose
- A pentose sugar is**
(A) Dihydroxyacetone (B) Ribulose
(C) Erythrose (D) Glucose
- The pentose sugar present mainly in the heart muscle is**
(A) Lyxose (B) Ribose
(C) Arabinose (D) Xylose
- Polysaccharides are**
(A) Polymers (B) Acids
(C) Proteins (D) Oils
- The number of isomers of glucose is**
(A) 2 (B) 4
(C) 8 (D) 16
- Two sugars which differ from one another only in configuration around a single carbon atom are termed**
(A) Epimers (B) Anomers
(C) Optical isomers (D) Stereoisomers
- Isomers differing as a result of variations in configuration of the —OH and —H on carbon atoms 2, 3 and 4 of glucose are known as**
(A) Epimers (B) Anomers
(C) Optical isomers (D) Stereoisomers
- The most important epimer of glucose is**
(A) Galactose (B) Fructose
(C) Arabinose (D) Xylose
- α -D-glucose and β -D-glucose are**
(A) Stereoisomers (B) Epimers
(C) Anomers (D) Keto-aldo pairs
- α -D-glucose + $112^\circ \rightarrow + 52.5^\circ \leftarrow + 19^\circ \beta$ -D-glucose for glucose above represents**
(A) Optical isomerism (B) Mutarotation
(C) Epimerisation (D) D and L isomerism
- Compounds having the same structural formula but differing in spatial configuration are known as**
(A) Stereoisomers (B) Anomers
(C) Optical isomers (D) Epimers

- 15. In glucose the orientation of the —H and —OH groups around the carbon atom 5 adjacent to the terminal primary alcohol carbon determines**
- (A) D or L series
(B) Dextro or levorotatory
(C) α and β anomers
(D) Epimers
- 16. The carbohydrate of the blood group substances is**
- (A) Sucrose (B) Fucose
(C) Arabinose (D) Maltose
- 17. Erythromycin contains**
- (A) Dimethyl amino sugar
(B) Trimethyl amino sugar
(C) Sterol and sugar
(D) Glycerol and sugar
- 18. A sugar alcohol is**
- (A) Mannitol (B) Trehalose
(C) Xylulose (D) Arabinose
- 19. The major sugar of insect hemolymph is**
- (A) Glycogen (B) Pectin
(C) Trehalose (D) Sucrose
- 20. The sugar found in DNA is**
- (A) Xylose (B) Ribose
(C) Deoxyribose (D) Ribulose
- 21. The sugar found in RNA is**
- (A) Ribose (B) Deoxyribose
(C) Ribulose (D) Erythrose
- 22. The sugar found in milk is**
- (A) Galactose (B) Glucose
(C) Fructose (D) Lactose
- 23. Invert sugar is**
- (A) Lactose (B) Sucrose
(C) Hydrolytic products of sucrose
(D) Fructose
- 24. Sucrose consists of**
- (A) Glucose + glucose
(B) Glucose + fructose
(C) Glucose + galactose
(D) Glucose + mannose
- 25. The monosaccharide units are linked by 1 \rightarrow 4 glycosidic linkage in**
- (A) Maltose (B) Sucrose
(C) Cellulose (D) Cellobiose
- 26. Which of the following is a non-reducing sugar?**
- (A) Isomaltose (B) Maltose
(C) Lactose (D) Trehalose
- 27. Which of the following is a reducing sugar?**
- (A) Sucrose (B) Trehalose
(C) Isomaltose (D) Agar
- 28. A disaccharide formed by 1,1-glycosidic linkage between their monosaccharide units is**
- (A) Lactose (B) Maltose
(C) Trehalose (D) Sucrose
- 29. A disaccharide formed by 1,1-glycosidic linkage between their monosaccharide units is**
- (A) Lactose (B) Maltose
(C) Trehalose (D) Sucrose
- 30. Mutarotation refers to change in**
- (A) pH (B) Optical rotation
(C) Conductance (D) Chemical properties
- 31. A polysacchharide which is often called animal starch is**
- (A) Glycogen (B) Starch
(C) Inulin (D) Dextrin
- 32. The homopolysaccharide used for intravenous infusion as plasma substitute is**
- (A) Agar (B) Inulin
(C) Pectin (D) Starch
- 33. The polysaccharide used in assessing the glomerular fittration rate (GFR) is**
- (A) Glycogen (B) Agar
(C) Inulin (D) Hyaluronic acid

- 34. The constituent unit of inulin is**
(A) Glucose (B) Fructose
(C) Mannose (D) Galactose
- 35. The polysaccharide found in the exoskeleton of invertebrates is**
(A) Pectin (B) Chitin
(C) Cellulose (D) Chondroitin sulphate
- 36. Which of the following is a heteroglycan?**
(A) Dextrins (B) Agar
(C) Inulin (D) Chitin
- 37. The glycosaminoglycan which does not contain uronic acid is**
(A) Dermatan sulphate
(B) Chondroitin sulphate
(C) Keratan sulphate
(D) Heparan sulphate
- 38. The glycosaminoglycan which does not contain uronic acid is**
(A) Hyaluronic acid
(B) Heparin
(C) Chondroitin sulphate
(D) Dermatan sulphate
- 39. Keratan sulphate is found in abundance in**
(A) Heart muscle (B) Liver
(C) Adrenal cortex (D) Cornea
- 40. Repeating units of hyaluronic acid are**
(A) N-acetyl glucosamine and D-glucuronic acid
(B) N-acetyl galactosamine and D-glucuronic acid
(C) N-acetyl glucosamine and galactose
(D) N-acetyl galactosamine and L-iduronic acid
- 41. The approximate number of branches in amylopectin is**
(A) 10 (B) 20
(C) 40 (D) 80
- 42. In amylopectin the intervals of glucose units of each branch is**
(A) 10–20 (B) 24–30
(C) 30–40 (D) 40–50
- 43. A polymer of glucose synthesized by the action of *Leuconostoc mesenteroides* in a sucrose medium is**
(A) Dextrans (B) Dextrin
(C) Limit dextrin (D) Inulin
- 44. Glucose on reduction with sodium amalgam forms**
(A) Dulcitol (B) Sorbitol
(C) Mannitol (D) Mannitol and sorbitol
- 45. Glucose on oxidation does not give**
(A) Glycoside (B) Glucosaccharic acid
(C) Gluconic acid (D) Glucuronic acid
- 46. Oxidation of galactose with conc HNO_3 yields**
(A) Mucic acid (B) Glucuronic acid
(C) Saccharic acid (D) Gluconic acid
- 47. A positive Benedict's test is not given by**
(A) Sucrose (B) Lactose
(C) Maltose (D) Glucose
- 48. Starch is a**
(A) Polysaccharide (B) Monosaccharide
(C) Disaccharide (D) None of these
- 49. A positive Seliwanoff's test is obtained with**
(A) Glucose (B) Fructose
(C) Lactose (D) Maltose
- 50. Osazones are not formed with the**
(A) Glucose (B) Fructose
(C) Sucrose (D) Lactose
- 51. The most abundant carbohydrate found in nature is**
(A) Starch (B) Glycogen
(C) Cellulose (D) Chitin
- 52. Impaired renal function is indicated when the amount of PSP excreted in the first 15 minutes is**
(A) 20% (B) 35%
(C) 40% (D) 45%
- 53. An early feature of renal disease is**
(A) Impairment of the capacity of the tubule to perform osmotic work

- (B) Decrease in maximal tubular excretory capacity
(C) Decrease in filtration factor
(D) Decrease in renal plasma flow
- 54. ADH test is based on the measurement of**
(A) Specific gravity of urine
(B) Concentration of urea in urine
(C) Concentration of urea in blood
(D) Volume of urine in ml/minute
- 55. The specific gravity of urine normally ranges from**
(A) 0.900–0.999 (B) 1.003–1.030
(C) 1.000–1.001 (D) 1.101–1.120
- 56. Specific gravity of urine increases in**
(A) Diabetes mellitus
(B) Chronic glomerulonephritis
(C) Compulsive polydypsia
(D) Hypercalcemia
- 57. Fixation of specific gravity of urine to 1.010 is found in**
(A) Diabetes insipidus
(B) Compulsive polydypsia
(C) Cystinosis
(D) Chronic glomerulonephritis
- 58. Addis test is the measure of**
(A) Impairment of the capacity of the tubule to perform osmotic work
(B) Secretory function of liver
(C) Excretory function of liver
(D) Activity of parenchymal cells of liver
- 59. Number of stereoisomers of glucose is**
(A) 4 (B) 8
(C) 16 (D) None of these
- 60. Maltose can be formed by hydrolysis of**
(A) Starch (B) Dextrin
(C) Glycogen (D) All of these
- 61. α -D-Glucuronic acid is present in**
(A) Hyaluronic acid (B) Chondroitin sulphate
(C) Heparin (D) All of these
- 62. Fructose is present in hydrolysate of**
(A) Sucrose (B) Inulin
(C) Both of the above (D) None of these
- 63. A carbohydrate found in DNA is**
(A) Ribose (B) Deoxyribose
(C) Ribulose (D) All of these
- 64. Ribulose is a these**
(A) Ketotetrose (B) Aldotetrose
(C) Ketopentose (D) Aldopentose
- 65. A carbohydrate, commonly known as dextrose is**
(A) Dextrin (B) D-Fructose
(C) D-Glucose (D) Glycogen
- 66. A carbohydrate found only in milk is**
(A) Glucose (B) Galactose
(C) Lactose (D) Maltose
- 67. A carbohydrate, known commonly as invert sugar, is**
(A) Fructose (B) Sucrose
(C) Glucose (D) Lactose
- 68. A heteropolysaccharide among the following is**
(A) Inulin (B) Cellulose
(C) Heparin (D) Dextrin
- 69. The predominant form of glucose in solution is**
(A) Acyclic form
(B) Hydrated acyclic form
(C) Glucofuranose
(D) Glucopyranose
- 70. An L-isomer of monosaccharide formed in human body is**
(A) L-fructose (B) L-Erythrose
(C) L-Xylose (D) L-Xylulose
- 71. Hyaluronic acid is found in**
(A) Joints (B) Brain
(C) Abdomen (D) Mouth
- 72. The carbon atom which becomes asymmetric when the straight chain form of monosaccharide changes into ring form is known as**

- (A) Anomeric carbon atom
(B) Epimeric carbon atom
(C) Isomeric carbon atom
(D) None of these
- 73. The smallest monosaccharide having furanose ring structure is**
(A) Erythrose (B) Ribose
(C) Glucose (D) Fructose
- 74. Which of the following is an epimeric pair?**
(A) Glucose and fructose
(B) Glucose and galactose
(C) Galactose and mannose
(D) Lactose and maltose
- 75. α -Glycosidic bond is present in**
(A) Lactose (B) Maltose
(C) Sucrose (D) All of these
- 76. Branching occurs in glycogen approximately after every**
(A) Five glucose units
(B) Ten glucose units
(C) Fifteen glucose units
(D) Twenty glucose units
- 77. N-Acetylglucosamine is present in**
(A) Hyaluronic acid (B) Chondroitin sulphate
(C) Heparin (D) All of these
- 78. Iodine gives a red colour with**
(A) Starch (B) Dextrin
(C) Glycogen (D) Inulin
- 79. Amylose is a constituent of**
(A) Starch (B) Cellulose
(C) Glycogen (D) None of these
- 80. Synovial fluid contains**
(A) Heparin
(B) Hyaluronic acid
(C) Chondroitin sulphate
(D) Keratin sulphate
- 81. Gluconeogenesis is decreased by**
(A) Glucagon (B) Epinephrine
(C) Glucocorticoids (D) Insulin
- 82. Lactate formed in muscles can be utilised through**
(A) Rapoport-Luebeling cycle
(B) Glucose-alanine cycle
(C) Cori's cycle
(D) Citric acid cycle
- 83. Glucose-6-phosphatase is not present in**
(A) Liver and kidneys
(B) Kidneys and muscles
(C) Kidneys and adipose tissue
(D) Muscles and adipose tissue
- 84. Pyruvate carboxylase is regulated by**
(A) Induction (B) Repression
(C) Allosteric regulation (D) All of these
- 85. Fructose-2, 6-biphosphate is formed by the action of**
(A) Phosphofructokinase-1
(B) Phosphofructokinase-2
(C) Fructose biphosphate isomerase
(D) Fructose-1, 6-biphosphatase
- 86. The highest concentrations of fructose are found in**
(A) Aqueous humor (B) Vitreous humor
(C) Synovial fluid (D) Seminal fluid
- 87. Glucose uptake by liver cells is**
(A) Energy-consuming (B) A saturable process
(C) Insulin-dependent (D) Insulin-independent
- 88. Renal threshold for glucose is decreased in**
(A) Diabetes mellitus (B) Insulinoma
(C) Renal glycosuria (D) Alimentary glycosuria
- 89. Active uptake of glucose is inhibited by**
(A) Ouabain (B) Phlorrizin
(C) Digoxin (D) Alloxan
- 90. Glucose-6-phosphatase is absent or deficient in**
(A) Von Gierke's disease
(B) Pompe's disease
(C) Cori's disease
(D) McArdle's disease

- 91. Debranching enzyme is absent in**
 (A) Cori's disease
 (B) Andersen's disease
 (C) Von Gierke's disease
 (D) Her's disease
- 92. McArdle's disease is due to the deficiency of**
 (A) Glucose-6-phosphatase
 (B) Phosphofructokinase
 (C) Liver phosphorylase
 (D) muscle phosphorylase
- 93. Tautomerisation is**
 (A) Shift of hydrogen (B) Shift of carbon
 (C) Shift of both (D) None of these
- 94. In essential pentosuria, urine contains**
 (A) D-Ribose (B) D-Xylulose
 (C) L-Xylulose (D) D-Xylose
- 95. Action of salivary amylase on starch leads to the formation of**
 (A) Maltose (B) Maltotriose
 (C) Both of the above (D) Neither of these
- 96. Congenital galactosaemia can lead to**
 (A) Mental retardation
 (B) Premature cataract
 (C) Death
 (D) All of the above
- 97. Uridine diphosphate glucose (UDPG) is**
 (A) Required for metabolism of galactose
 (B) Required for synthesis of glucuronic acid
 (C) A substrate for glycogen synthetase
 (D) All of the above
- 98. Catalytic activity of salivary amylase requires the presence of**
 (A) Chloride ions (B) Bromide ions
 (C) Iodide ions (D) All of these
- 99. The following is actively absorbed in the intestine:**
 (A) Fructose (B) Mannose
 (C) Galactose (D) None of these
- 100. An amphibolic pathway among the following is**
 (A) HMP shunt (B) Glycolysis
 (C) Citric acid cycle (D) Gluconeogenesis
- 101. Cori's cycle transfers**
 (A) Glucose from muscles to liver
 (B) Lactate from muscles to liver
 (C) Lactate from liver to muscles
 (D) Pyruvate from liver to muscles
- 102. Excessive intake of ethanol increases the ratio:**
 (A) NADH : NAD⁺ (B) NAD⁺ : NADH
 (C) FADH₂ : FAD (D) FAD : FADH₂
- 103. Ethanol decreases gluconeogenesis by**
 (A) Inhibiting glucose-6-phosphatase
 (B) Inhibiting PEP carboxykinase
 (C) Converting NAD⁺ into NADH and decreasing the availability of pyruvate
 (D) Converting NAD⁺ into NADH and decreasing the availability of lactate
- 104. Glycogenin is**
 (A) Uncoupler of oxidative phosphorylation
 (B) Polymer of glycogen molecules
 (C) Protein primer for glycogen synthesis
 (D) Intermediate in glycogen breakdown
- 105. During starvation, ketone bodies are used as a fuel by**
 (A) Erythrocytes (B) Brain
 (C) Liver (D) All of these
- 106. Animal fat is in general**
 (A) Poor in saturated and rich in polyunsaturated fatty acids
 (B) Rich in saturated and poor in polyunsaturated fatty acids
 (C) Rich in saturated and polyunsaturated fatty acids
 (D) Poor in saturated and polyunsaturated fatty acids
- 107. In the diet of a diabetic patient, the recommended carbohydrate intake should preferably be in the form of**

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

108. Obesity increases the risk of

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

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

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

110. Consumption of iodised salt is recommended for prevention of

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

111. Restriction of salt intake is generally recommended in

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

112. Polyuria can occur in

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

113. Normal specific gravity of urine is

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

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

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

115. Specific gravity of urine is decreased in

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

116. Heavy proteinuria occurs in

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

117. Mucopolysaccharides are

- (A) Homopolysaccharides
(B) Heteropolysaccharides
(C) Proteins
(D) Amino acids

118. Bence-Jones protein precipitates at

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

119. Serum cholesterol is decreased in

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

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

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

121. The general formula for polysaccharide is

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

122. The number of isomers of glucose is

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

123. The epimers of glucose is

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

124. The intermediate in hexose monophosphate shunt is

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

125. Honey contains the hydrolytic product of

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

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

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

- 127. Glycosides are found in many**
 (A) Vitamins (B) Drugs
 (C) Minerals (D) Nucleoproteins
- 128. Galactose on oxidation with conc. HNO_3 produces**
 (A) Gluconic acid (B) Saccharic acid
 (C) Saccharo Lactone (D) Mucic acid
- 129. The distinguishing test between mono-saccharides and disaccharides is**
 (A) Bial's test (B) Selwanoff's test
 (C) Barfoed's test (D) Hydrolysis test
- 130. Cellulose is made up of the molecules of**
 (A) α -glucose (B) β -glucose
 (C) Both of the above (D) None of these
- 131. Iodine solution produces no color with**
 (A) Cellulose (B) Starch
 (C) Dextrin (D) Glycogen
- 132. Glycogen structure includes a branch in between-glucose units:**
 (A) 6-12 (B) 8-14
 (C) 6-10 (D) 12-18
- 133. Amylose contains glucose units**
 (A) 100-200 (B) 200-300
 (C) 300-400 (D) 500-600
- 134. Each branch of amylopectin is at an interval of glucose units:**
 (A) 14-20 (B) 24-30
 (C) 34-40 (D) 44-50
- 135. N-acetylneuraminic acid is an example of**
 (A) Sialic acid (B) Mucic acid
 (C) Glucuronic acid (D) Hippuric acid
- 136. In place of glucuronic acid chondroitin sulphate B contains**
 (A) Gluconic acid (B) Gulonic acid
 (C) Induronic acid (D) Sulphonic acid
- 137. Blood group substances consist of**
 (A) Lactose (B) Maltose
 (C) Fructose (D) Mucose
- 138. The component of cartilage and cornea is**
 (A) Keratosulphate
 (B) Chondroitin sulphate
 (C) Cadmium sulphate
 (D) Antimony sulphate
- 139. Benedict's test is less likely to give weakly positive results with concentrated urine due to the action of**
 (A) Urea (B) Uric acid
 (C) Ammonium salts (D) Phosphates
- 140. Active transport of sugar is depressed by the agent:**
 (A) Oxaloacetate (B) Fumarate
 (C) Malonate (D) Succinate
- 141. The general test for detection of carbohydrates is**
 (A) Iodine test (B) Molisch test
 (C) Barfoed test (D) Osazone test
- 142. Glucose absorption may be decreased in**
 (A) Oedema (B) Nephritis
 (C) Rickets (D) Osteomalitis
- 143. Glycogen synthetase activity is depressed by**
 (A) Glucose (B) Insulin
 (C) Cyclic AMP (D) Fructokinase
- 144. The branching enzyme acts on the glycogen when the glycogen chain has been lengthened to between glucose units:**
 (A) 1 and 6 (B) 2 and 7
 (C) 3 and 9 (D) 6 and 11
- 145. Cyclic AMP is formed from ATP by the enzyme adenylate cyclase which is activated by the hormone:**
 (A) Insulin (B) Epinephrine
 (C) Testosterone (D) Progesterone
- 146. Hexokinase has a high affinity for glucose than**
 (A) Fructokinase (B) Galactokinase
 (C) Glucokinase (D) All of the above
- 147. Dihydroxyacetone phosphate and glyceraldehyde-3-phosphate are interconverted by**

- (A) Triose isomerase
(B) Phosphotriose isomerase
(C) Diphosphotriose isomerase
(D) Dihydroxyacetone phosphorylase
- 148. Citrate is converted to isocitrate by aconitase which contains**
(A) Ca^{++} (B) Fe^{++}
(C) Zn^{++} (D) Mg^{++}
- 149. The reaction succinyl COA to succinate requires**
(A) CDP (B) ADP
(C) GDP (D) NADP^+
- 150. The carrier of the citric acid cycle is**
(A) Succinate (B) Fumarate
(C) Malate (D) Oxaloacetate
- 151. UDPG is oxidized to UDP glucuronic acid by UDP dehydrogenase in presence of**
(A) FAD^+ (B) NAD^+
(C) NADP^+ (D) ADP^+
- 152. Galactose is phosphorylated by galactokinase to form**
(A) Galactose-6-phosphate
(B) Galactose-1, 6 diphosphate
(C) Galactose-1-phosphate
(D) All of these
- 153. The conversion of alanine to glucose is termed**
(A) Glycolysis
(B) Oxidative decarboxylation
(C) Specific dynamic action
(D) Gluconeogenesis
- 154. The blood sugar raising action of the hormones of suprarenal cortex is due to**
(A) Gluconeogenesis
(B) Glycogenolysis
(C) Glucagon-like activity
(D) Due to inhibition of glomerular filtration
- 155. Under anaerobic conditions the glycolysis one mole of glucose yields ___ moles of ATP.**
(A) One (B) Two
(C) Eight (D) Thirty
- 156. Which of the following metabolite integrates glucose and fatty acid metabolism?**
(A) Acetyl CoA (B) Pyruvate
(C) Citrate (D) Lactate
- 157. Cerebrosides consist of mostly of this sugar:**
(A) Glucose (B) Fructose
(C) Galactose (D) Arabinose
- 158. Glucose will be converted into fatty acids if the diet has excess of**
(A) Carbohydrates (B) Proteins
(C) Fat (D) Vitamins
- 159. The purple ring of Molisch reaction is due to**
(A) Furfural
(B) Furfural + α Naphthol
(C) $^{\circ}\text{C}$ Naphthol
(D) Furfural + H_2SO_4 + α -Naphthol
- 160. One of the following enzymes does not change glycogen synthase a to b.**
(A) Glycogen synthase kinases 3, 4, 5
(B) Ca^{2+} calmodulin phosphorylase kinase
(C) Ca^{2+} calmodulin dependent protein kinase
(D) Glycogen phosphorylase a
- 161. In EM pathway-2-phosphoglycerate is converted to**
(A) Phospho enol pyruvate
(B) Enol pyruvate
(C) Di hydroxy acetone phosphate (DHAP)
(D) 1,3 bisphosphoglycerate
- 162. An aneplerotic reaction which sustains the availability of oxaloacetate is the carboxylation of**
(A) Glutamate (B) Pyruvate
(C) Citrate (D) Succinate
- 163. Specific test for ketohexoses:**
(A) Seliwanoff's test (B) Osazone test
(C) Molisch test (D) None of these
- 164. Two important byproducts of HMP shunt are**
(A) NADH and pentose sugars
(B) NADPH and pentose sugars

- (C) Pentose sugars and 4 membered sugars
(D) Pentose sugars and sedoheptulose
- 165. Pyruvate dehydrogenase complex and α -ketoglutarate dehydrogenase complex require the following for their oxidative decarboxylation:**
- (A) COASH and Lipoic acid
(B) NAD⁺ and FAD
(C) COASH and TPP
(D) COASH, TPP, NAD⁺, FAD, Lipoate
- 166. The four membered aldose sugar phosphate formed in HMP shunt pathway is**
- (A) Xylulose P (B) Erythrulose P
(C) Erythrose P (D) Ribulose P
- 167. Cane sugar (Sucrose) injected into blood is**
- (A) changed to fructose
(B) changed to glucose
(C) undergoes no significant change
(D) changed to glucose and fructose
- 168. Pentose production is increased in**
- (A) HMP shunt
(B) Uronic acid pathway
(C) EM pathway
(D) TCA cycle
- 169. Conversion of Alanine to carbohydrate is termed:**
- (A) Glycogenesis (B) Gluconeogenesis
(C) Glycogenolysis (D) Photosynthesis
- 170. The following is an enzyme required for glycolysis:**
- (A) Pyruvate kinase
(B) Pyruvate carboxylase
(C) Glucose-6-phosphatase
(D) Glycerokinase
- 171. Our body can get pentoses from**
- (A) Glycolytic pathway
(B) Uronic acid pathway
(C) TCA cycle
(D) HMP shunt
- 172. Conversion of glucose to glucose-6-phosphate in human liver is by**
- (A) Hexokinase only
(B) Glucokinase only
(C) Hexokinase and glucokinase
(D) Glucose-6-phosphate dehydrogenase
- 173. The following is an enzyme required for glycolysis:**
- (A) Pyruvate kinase
(B) Pyruvate carboxylase
(C) Glucose-6-phosphatase
(D) Glycerokinase
- 174. The normal glucose tolerance curve reaches peak is**
- (A) 15 min (B) 1 hr
(C) 2 hrs (D) 2 ½ hrs
- 175. Oxidative decarboxylation of pyruvate requires**
- (A) NADP⁺
(B) Cytichromes
(C) pyridoxal phosphate
(D) COASH
- 176. Glucose tolerance is increased in**
- (A) Diabetes mellitus (B) Adrenalectomy
(C) Acromegaly (D) Thyrotoxicosis
- 177. Glucose tolerance is decreased in**
- (A) Diabetes mellitus (B) Hypopituitarism
(C) Addison's disease (D) Hypothyroidism
- 178. During glycolysis, Fructose 1,6 diphosphate is decomposed by the enzyme:**
- (A) Enolase a
(B) Fructokinase
(C) Aldolase
(D) Diphosphofructophosphatase
- 179. The following enzyme is required for the hexose monophosphate shunt pathway:**
- (A) Glucose-6-phosphatase
(B) Phosphorylase
(C) Aldolase
(D) Glucose-6-phosphate dehydrogenase

- 180. Dehydrogenase enzymes of the hexose monophosphate shunt are**
(A) NAD⁺ specific (B) NADP⁺ specific
(C) FAD specific (D) FMN specific
- 181. Under anaerobic conditions the glycolysis of one mole of glucose yields _____ moles of ATP.**
(A) One (B) Two
(C) Eight (D) Thirty
- 182. Glycogen is converted to glucose-1-phosphate by**
(A) UDPG transferase (B) Branching enzyme
(C) Phosphorylase (D) Phosphatase
- 183. Which of the following is not an enzyme involved in glycolysis?**
(A) Evulase (B) Aldolase
(C) Hexokinase (D) Glucose oxidase
- 184. Tricarboxylic acid cycle to be continuous requires the regeneration of**
(A) Pyruvic acid (B) oxaloacetic acid
(C) α -oxoglutaric acid (D) Malic acid
- 185. Dehydrogenation of succinic acid to fumaric acid requires the following hydrogen carrier:**
(A) NAD⁺ (B) NADP⁺
(C) flavoprotein (D) Glutathione
- 186. The tissues with the highest total glycogen content are**
(A) Muscle and kidneys
(B) Kidneys and liver
(C) Liver and muscle
(D) Brain and Liver
- 187. Rothera test is not given by**
(A) β -hydroxy butyrate (B) bile salts
(C) Glucose (D) None of these
- 188. Gluconeogenesis is increased in the following condition:**
(A) Diabetes insipidus (B) Diabetes Mellitus
(C) Hypothyroidism (D) Liver diseases
- 189. The oxidation of lactic acid to pyruvic acid requires the following vitamin derivative as the hydrogen carrier.**
(A) Lithium pyrophosphate
(B) Coenzyme A
(C) NAD⁺
(D) FMN
- 190. Physiological glycosuria is met with in**
(A) Renal glycosuria
(B) Alimentary glycosuria
(C) Diabetes Mellitus
(D) Alloxan diabetes
- 191. Two examples of substrate level phosphorylation in EM pathway of glucose metabolism are in the reactions of**
(A) 1,3 bisphosphoglycerate and phosphoenolpyruvate
(B) Glucose-6 phosphate and Fructo-6-phosphate
(C) 3 phosphoglyceraldehyde and phosphoenolpyruvate
(D) 1,3 diphosphoglycerate and 2-phosphoglycerate
- 192. The number of molecules of ATP produced by the total oxidation of acetyl CoA in TCA cycle is**
(A) 6 (B) 8
(C) 10 (D) 12
- 193. Substrate level phosphorylation in TCA cycle is in step:**
(A) Isocitrate dehydrogenase
(B) Malate dehydrogenase
(C) Aconitase
(D) Succinate thiokinase
- 194. Fatty acids cannot be converted into carbohydrates in the body as the following reaction is not possible.**
(A) Conversion of glucose-6-phosphate into glucose
(B) Fructose 1,6-bisphosphate to fructose-6-phosphate
(C) Transformation of acetyl CoA to pyruvate
(D) Formation of acetyl CoA from fatty acids

- 195. Tissues form lactic acid from glucose. This phenomenon is termed as**
- (A) Aerobic glycolysis
(B) Oxidation
(C) Oxidative phosphorylation
(D) Anaerobic glycolysis
- 196. One molecule of glucose gives _____ molecules of CO₂ in EM-TCA cycle.**
- (A) 6 (B) 3
(C) 1 (D) 2
- 197. One molecule of glucose gives _____ molecules of CO₂ in one round of HMP shunt.**
- (A) 6 (B) 1
(C) 2 (D) 3
- 198. The 4 rate limiting enzymes of gluconeogenesis are**
- (A) Glucokinase, Pyruvate carboxylase, phosphoenol pyruvate carboxykinase and glucose-6-phosphatase
(B) Pyruvate carboxylase, phosphoenol pyruvate carboxykinase, fructose 1,6 diphosphatase and glucose-6-phosphatase
(C) Pyruvate kinase, pyruvate carboxylase, phosphoenol pyruvate carboxykinase and glucose-6-phosphatase
(D) Phospho fructokinase, pyruvate carboxylase, phosphoenol pyruvate carboxykinase and fructose 1, 6 diphosphatase
- 199. For glycogenesis, Glucose should be converted to**
- (A) Glucuronic acid (B) Pyruvic acid
(C) UDP glucose (D) Sorbitol
- 200. Fluoride inhibits _____ and arrests glycolysis.**
- (A) Glyceraldehyde-3-phosphate dehydrogenase
(B) Aconitase
(C) Enolase
(D) Succinate dehydrogenase
- 201. One of the following statement is correct:**
- (A) Glycogen synthase 'a' is the phosphorylated
(B) cAMP converts glycogen synthase b to 'a'
(C) Insulin converts glycogen synthase b to a
(D) UDP glucose molecules interact and grow into a Glycogen tree
- 202. Amylo 1, 6 glucosidase is called**
- (A) Branching enzyme
(B) debranching enzyme
(C) Glucantransferase
(D) Phosphorylase
- 203. Glucose enters the cells by**
- (A) insulin independent transport
(B) insulin dependent transport
(C) enzyme mediated transport
(D) Both (A) and (B)
- 204. Glycogen while being acted upon by active phosphorylase is converted first to**
- (A) Glucose
(B) Glucose 1-phosphate and Glycogen with 1 carbon less
(C) Glucose-6-phosphate and Glycogen with 1 carbon less
(D) 6-Phosphogluconic acid
- 205. When O₂ supply is inadequate, pyruvate is converted to**
- (A) Phosphopyruvate (B) Acetyl CoA
(C) Lactate (D) Alanine
- 206. Reactivation of inactive liver phosphorylase is normally favoured by**
- (A) Insulin (B) Epinephrine
(C) ACTH (D) Glucagon
- 207. Before pyruvic acid enters the TCA cycle it must be converted to**
- (A) Acetyl CoA (B) Lactate
(C) α-ketoglutarate (D) Citrate
- 208. The hydrolysis of Glucose-6-phosphate is catalysed by a specific phosphatase which is found only in**
- (A) Liver, intestines and kidneys
(B) Brain, spleen and adrenals
(C) Striated muscle
(D) Plasma
- 209. The formation of citrate from oxaloacetate and acetyl CoA is**
- (A) Oxidation (B) Reduction
(C) Condensation (D) Hydrolysis

- 210. Which one of the following is a rate limiting enzyme of gluconeogenesis?**
(A) Hexokinase
(B) Phosphofruktokinase
(C) Pyruvate carboxylase
(D) Pyruvate kinase
- 211. The number of ATP produced in the succinate dehydrogenase step is**
(A) 1 (B) 2
(C) 3 (D) 4
- 212. Which of the following reaction gives lactose?**
(A) UDP galactose and glucose
(B) UDP glucose and galactose
(C) Glucose and Galactose
(D) Glucose, Galactose and UTP
- 213. UDP Glucuronic acid is required for the biosynthesis of**
(A) Chondroitin sulphates
(B) Glycogen
(C) Lactose
(D) Starch
- 214. Which one of the following can convert glucose to vitamin C?**
(A) Albino rats (B) Humans
(C) Monkeys (D) Guinea pigs
- 215. Which one of the following cannot convert glucose to Vitamin C?**
(A) Albino rats (B) Dogs
(C) Monkeys (D) Cows
- 216. Transketolase has the coenzyme:**
(A) NAD⁺ (B) FP
(C) TPP (D) Pyridoxol phosphate
- 217. Two conditions in which gluconeogenesis is increased are**
(A) Diabetes mellitus and atherosclerosis
(B) Fed condition and thyrotoxicosis
(C) Diabetes mellitus and Starvation
(D) Alcohol intake and cigarette smoking
- 218. Acetyl CoA is not used for the synthesis of**
(A) Fatty acid (B) Cholesterol
(C) Pyruvic acid (D) Citric acid
- 219. The total glycogen content of the body is about _____ gms.**
(A) 100 (B) 200
(C) 300 (D) 500
- 220. The total Glucose in the body is _____ gms.**
(A) 10–15 (B) 20–30
(C) 40–50 (D) 60–80
- 221. Pyruvate kinase requires _____ ions for maximum activity.**
(A) Na⁺ (B) K⁺
(C) Ca²⁺ (D) Mg²⁺
- 222. ATP is 'wasted' in Rapoport-Luebering cycle in RBCs as otherwise it will inhibit**
(A) Phosphoglucomutase
(B) Phosphohexo isomerase
(C) Phosphofruktokinase
(D) Phosphoenol pyruvate carboxy kinase
- 223. The following co-enzyme is needed for the oxidative decarboxylation of ketoacids:**
(A) NADP⁺ (B) TPP
(C) Folate coenzyme (D) Biotin coenzyme
- 224. Synthesis of Glucose from amino acids is termed as**
(A) Glycolysis (B) Gluconeogenesis
(C) Glycogenesis (D) Lipogenesis
- 225. The following examples are important heteropolysaccharides except**
(A) Amylopectin (B) Heparin
(C) Peptidoglycan (D) Hyaluronic acid
- 226. Which of the following features are common to monosaccharides?**
(A) Contain asymmetric centres
(B) Are of 2 types – aldoses and ketoses
(C) Tend to exist as ring structures in solution
(D) Include glucose, galactose and raffinose

- 227. Polysaccharides**
- (A) Contain many monosaccharide units which may or may not be of the same kind
 - (B) Function mainly a storage or structural compounds
 - (C) Are present in large amounts in connective tissue
 - (D) All of these
- 228. The absorption of glucose in the digestive tract**
- (A) Occurs in the small intestine
 - (B) Is stimulated by the hormone Glucagon
 - (C) Occurs more rapidly than the absorption of any other sugar
 - (D) Is impaired in cases of diabetes mellitus
- 229. UDP-Glucose is converted to UDP-Glucuronic acid by**
- (A) ATP
 - (B) GTP
 - (C) NADP⁺
 - (D) NAD⁺
- 230. The enzymes involved in Phosphorylation of glucose to glucose 6- phosphate are**
- (A) Hexokinase
 - (B) Glucokinase
 - (C) Phosphofructokinase
 - (D) Both (A) and (B)
- 231. In conversion of Lactic acid to Glucose, three reactions of Glycolytic pathway are circumvented, which of the following enzymes do not participate?**
- (A) Pyruvate Carboxylase
 - (B) Phosphoenol pyruvate carboxy kinase
 - (C) Pyruvate kinase
 - (D) Glucose-6-phosphatase
- 232. The normal resting state of humans, most of the blood glucose burnt as "fuel" is consumed by**
- (A) Liver
 - (B) Brain
 - (C) Kidneys
 - (D) Adipose tissue
- 233. A regulator of the enzyme Glycogen synthase is**
- (A) Citric acid
 - (B) 2, 3 bisphosphoglycerate
 - (C) Pyruvate
 - (D) GTP
- 234. Which of the following compound is a positive allosteric modifier of the enzyme pyruvate carboxylase?**
- (A) Biotin
 - (B) Acetyl CoA
 - (C) Oxaloacetate
 - (D) ATP
- 235. A specific inhibitor for succinate dehydrogenase is**
- (A) Arsinite
 - (B) Melouate
 - (C) Citrate
 - (D) Cyanide
- 236. Most of the metabolic pathways are either anabolic or catabolic. Which of the following pathways is considered as "amphibolic" in nature?**
- (A) Glycogenesis
 - (B) Glycolytic pathway
 - (C) Lipolysis
 - (D) TCA cycle
- 237. Transketolase activity is affected in**
- (A) Biotin deficiency
 - (B) Pyridoxine deficiency
 - (C) PABA deficiency
 - (D) Thiamine deficiency
- 238. The following metabolic abnormalities occur in Diabetes mellitus except**
- (A) Increased plasma FFA
 - (B) Increased pyruvate carboxylase activate
 - (C) Decreased lipogenesis
 - (D) Decreased gluconeogenesis
- 239. A substance that is not an intermediate in the formation of D-glucuronic acid from glucose is**
- (A) Glucosyl-1-p
 - (B) 6-Phosphogluconate
 - (C) Glucose-6-p
 - (D) UDP-Glucose
- 240. The hydrolysis of Glucose-6-P is catalysed by a phosphatase that is not formed in which of the following?**
- (A) Liver
 - (B) Kidney
 - (C) Muscle
 - (D) Small intestine
- 241. An essential for converting Glucose to Glycogen in Liver is**
- (A) Lactic acid
 - (B) GTP
 - (C) CTP
 - (D) UTP

- 242. Which of the following is a substrate for aldolase activity in Glycolytic pathway?**
- (A) Glyceraldehyde-3-p
(B) Glucose-6-p
(C) Fructose-6-p
(D) Fructose 1, 6-bisphosphate
- 243. The ratio that approximates the number of net molecule of ATP formed per mole of Glucose oxidized in presence of O₂ to the net number formed in absence of O₂ is**
- (A) 4 : 1 (B) 10 : 2
(C) 12 : 1 (D) 18 : 1
- 244. The "Primaquin sensitivity types of haemolytic anaemia has been found to relate to reduced R.B.C activity of which enzyme?**
- (A) Pyruvate kinase deficiency
(B) Glucose-6-phosphatase deficiency
(C) Glucose-6-p dehydrogenase deficiency
(D) Hexokinase deficiency
- 245. Which of the following hormones is not involved in carbohydrate metabolism?**
- (A) Cortisol (B) ACTH
(C) Glucogen (D) Vasopressin
- 246. Dehydrogenases involved in HMP shunt are specific for**
- (A) NADP⁺ (B) NAD⁺
(C) FAD (D) FMN
- 247. Which of the following enzymes in Glycolytic pathway is inhibited by fluoride?**
- (A) Glyceraldehyde-3-p dehydrogenase
(B) Phosphoglycerate kinase
(C) Pyruvate kinase
(D) Enolase
- 248. Out of 24 mols of ATP formed in TCA cycle, 2 molecules of ATP can be formed at "substrate level" by which of the following reaction ?**
- (A) Citric acid → Isocitric acid
(B) Isocitrate → Oxaloacetate
(C) Succinic acid → Fumarate
(D) Succinylcat → Succinic acid
- 249. Which of the following statements regarding T.C.A cycle is true?**
- (A) It is an anaerobic process
(B) It occurs in cytosol
(C) It contains no intermediates for Gluconeogenesis
(D) It is amphibolic in nature
- 250. An allosteric enzyme responsible for controlling the rate of T.C.A cycle is**
- (A) Malate dehydrogenase
(B) Isocitrate dehydrogenase
(C) Fumarase
(D) Aconitase
- 251. The glycolysis is regulated by**
- (A) Hexokinase (B) Phosphofructokinase
(C) Pyruvate kinase (D) All of these
- 252. How many ATP molecules will be required for conversion of 2-molecules of Lactic acid to Glucose?**
- (A) 2 (B) 4
(C) 8 (D) 6
- 253. Which of the following enzyme is not involved in HMP shunt?**
- (A) Glyceraldehyde-3-p dehydrogenase
(B) Glucose-6-p-dehydrogenase
(C) Transketolase
(D) Phosphogluconate dehydrogenase
- 254. In presence of the following cofactor, pyruvate carboxylase converts pyruvate to oxaloacetate:**
- (A) ATP, Protein and CO₂
(B) CO₂ and ATP
(C) CO₂
(D) Protein
- 255. For conversion of oxaloacetate to phosphoenol pyruvate, high energy molecule is required in the form of**
- (A) GTP only (B) ITP only
(C) GTP (or) ITP (D) None of these
- 256. If the more negative standard reduction potential of a redox pair, the greater the tendency to**

- (A) To lose electrons
 (B) To gain electrons
 (C) To lose/gain electrons
 (D) To lose and gain electrons
- 257. Electron transport and phosphorylation can be uncoupled by compounds that increase the permeability of the inner mitochondrial membrane to**
 (A) Electrons (B) Protons
 (C) Uncouplers (D) All of these
- 258. The more positive the E_0 , the greater the tendency of the oxidant member of that pair to**
 (A) Lose electrons
 (B) Gain electrons
 (C) Lose (or) gain electrons
 (D) Lose and gain electrons
- 259. The standard free energy of hydrolysis of terminal phosphate group of ATP is**
 (A) $-7,300$ cal/mol (B) $-8,300$ cal/mol
 (C) $10,000$ cal/mol (D) $+7,300$ cal/mol
- 260. The transport of a pair of electrons from NADH to O_2 via the electron transport chain produces**
 (A) $-52,580$ cal (B) $-50,580$ cal
 (C) $21,900$ cal (D) $+52,580$ cal
- 261. Sufficient energy required to produce 3 ATP from 3 ADP and 3 pi is**
 (A) $-21,900$ cal (B) $29,900$ cal
 (C) $31,900$ cal (D) $39,900$ cal
- 262. The free energy change, AG**
 (A) Is directly proportional to the standard free energy change, AG
 (B) Is equal to zero at equilibrium
 (C) Can only be calculated when the reactants and products are present at 1 mol/l concentrations
 (D) Is equal to $-RT$ in k_{eq}
- 263. Under standard conditions**
 (A) The free energy change ΔG° , is equal to 0
 (B) The standard free energy change ΔG , is equal to 0
 (C) The free energy change, ΔG° , is equal to the standard free energy change, ΔG°
 (D) K_{eq} is equal to 1
- 264. An uncoupler of oxidative phosphorylation such as dinitrophenol**
 (A) Inhibits electron transport and ATP synthesis
 (B) Allow electron transport to proceed without ATP synthesis
 (C) Inhibits electron transport without impairment of ATP synthesis
 (D) Specially inhibits cytochrome b
- 265. All of the following statements about the enzymic complex that carries out the synthesis of ATP during oxidative phosphorylation are correct except**
 (A) It is located on the matrix side of the inner mitochondrial membrane
 (B) It is inhibited by oligomycin
 (C) It can exhibit ATPase activity
 (D) It can bind molecular O_2
- 266. Glucokinase**
 (A) Is widely distributed and occurs in most mammalian tissues
 (B) Has a high k_m for glucose and hence is important in the phosphorylation of glucose primarily after ingestion of a carbohydrate rich meal
 (C) Is widely distributed in Prokaryotes
 (D) None of these
- 267. The reaction catalysed by phosphofructokinase**
 (A) Is activated by high concentrations of ATP and citrate
 (B) Uses fructose-1-phosphate as substrate
 (C) Is the rate-limiting reaction of the glycolytic pathway
 (D) Is inhibited by fructose 2, 6-bisphosphate
- 268. Compared to the resting state, vigorously contracting muscle shows**
 (A) An increased conversion of pyruvate to lactate
 (B) Decreased oxidation of pyruvate of CO_2 and water
 (C) A decreased NADH/NAD⁺ ratio
 (D) Decreased concentration of AMP

- 269. Which one of the following would be expected in pyruvate kinase deficiency?**
- (A) Increased levels of lactate in the R.B.C
 - (B) Hemolytic anemia
 - (C) Decreased ratio of ADP to ATP in R.B.C
 - (D) Increased phosphorylation of Glucose to Glucose-6-phosphate
- 270. Which one of the following statements concerning glucose metabolism is correct?**
- (A) The conversion of Glucose to lactate occurs only in the R.B.C
 - (B) Glucose enters most cells by a mechanism in which Na^+ and glucose are co-transported
 - (C) Pyruvate kinase catalyses an irreversible reaction
 - (D) An elevated level of insulin leads to a decreased level of fructose 2, 6-bisphosphate in hepatocyte
- 271. Which one of the following compounds cannot give rise to the net synthesis of Glucose?**
- (A) Lactate
 - (B) Glycerol
 - (C) α -ketoglutarate
 - (D) Acetyl CoA
- 272. Which of the following reactions is unique to gluconeogenesis?**
- (A) Lactate Pyruvate
 - (B) Phosphoenol pyruvate pyruvate
 - (C) Oxaloacetate phosphoenol pyruvate
 - (D) Glucose-6-phosphate Fructose-6-phosphate
- 273. The synthesis of glucose from pyruvate by gluconeogenesis**
- (A) Requires the participation of biotin
 - (B) Occurs exclusively in the cytosol
 - (C) Is inhibited by elevated level of insulin
 - (D) Requires oxidation/reduction of FAD
- 274. The conversion of pyruvate to acetyl CoA and CO_2**
- (A) Is reversible
 - (B) Involves the participation of lipoic acid
 - (C) Depends on the coenzyme biotin
 - (D) Occurs in the cytosol
- 275. Pasteur effect is**
- (A) Inhibition of glycolysis
 - (B) Oxygen is involved
 - (C) Inhibition of enzyme phosphofructokinase
 - (D) All of these
- 276. How many ATPs are produced in the conversion of phosphoenol pyruvate to citrate?**
- (A) 1
 - (B) 2
 - (C) 4
 - (D) 6
- 277. Reduced glutathione functions in R.B.Cs to**
- (A) Produce NADPH
 - (B) Reduce methemoglobin to hemoglobin
 - (C) Produce NADH
 - (D) Reduce oxidizing agents such as H_2O_2
- 278. Phenylalanine is the precursor of**
- (A) L-DOPA
 - (B) Histamine
 - (C) Tyrosine
 - (D) Throxine
- 279. D-Mannose is present in some plant products like**
- (A) Resins
 - (B) Pectins
 - (C) Mucilage
 - (D) Gums
- 280. Galactose is a main constituent of**
- (A) Milk sugar
 - (B) Honey
 - (C) Cane sugar
 - (D) Chitin
- 281. Glucosamine is an important constituent of**
- (A) Homopolysaccharide
 - (B) Heteropolysaccharide
 - (C) Mucopolysaccharide
 - (D) Dextran
- 282. Glycogen is present in all body tissues except**
- (A) Liver
 - (B) Brain
 - (C) Kidney
 - (D) Stomach
- 283. Iodine test is positive for starch, dextrin and**
- (A) Mucoproteins
 - (B) Agar
 - (C) Glycogen
 - (D) Cellulose

- 284. The general formula for polysaccharide is**
 (A) $(C_6H_{10}O_5)_n$ (B) $(C_6H_{12}O_6)_n$
 (C) $(C_6H_{12}O_5)_n$ (D) $(C_5H_{10}O_5)_n$
- 285. Epimers of glucose is**
 (A) Fructose (B) Galactose
 (C) Ribose (D) Deoxyribose
- 286. Human heart muscle contains**
 (A) D-Arabinose (B) D-Ribose
 (C) D-Xylose (D) L-Xylose
- 287. The intermediate n hexose monophosphate shunt is**
 (A) D-Ribulose (B) D-Arabinose
 (C) D-xylose (D) D-Lyxose
- 288. On boiling Benedict's solution is not reduced by**
 (A) Sucrose (B) Lactose
 (C) Maltose (D) Fructose
- 289. The distinguishing test between monosaccharides and disaccharide is**
 (A) Bial's test (B) Seliwanoff's test
 (C) Barfoed's test (D) Hydrolysis test
- 290. Barfoed's solution is not reduced by**
 (A) Glucose (B) Mannose
 (C) Sucrose (D) Ribose
- 291. Cori cycle is**
 (A) Synthesis of glucose
 (B) reuse of glucose
 (C) uptake of glycose
 (D) Both (A) & (B)
- 292. Cane sugar is known as**
 (A) Galactose (B) Sucrose
 (C) Fructose (D) Maltose
- 293. Which of the following is not reducing sugar?**
 (A) Lactose (B) Maltose
 (C) Sucrose (D) Fructose
- 294. α -D-Glucose and β -D-glucose are related by**
 (A) Epimers (B) Anomers
 (C) Multirotation (D) Ketoenol pair
- 295. The stable ring formation in D-Glucose involves**
 (A) C-1 and C-4 (B) C-1 and C-2
 (C) C-1 and C-5 (D) C-2 and C-5
- 296. Reduction of Glucose with Ca^{++} in water produces**
 (A) Sorbitol (B) Dulcitol
 (C) Mannitol (D) Glucuronic acid
- 297. Starch and glycogen are polymers of**
 (A) Fructose (B) Mannose
 (C) α -D-Glucose (D) Galactose
- 298. Reducing ability of carbohydrates is due to**
 (A) Carboxyl group (B) Hydroxyl group
 (C) Eneiol formation (D) Ring structure
- 299. Which of the following is not a polymer of glucose?**
 (A) Amylose (B) Inulin
 (C) Cellulose (D) Dextrin
- 300. Invert sugar is**
 (A) Lactose
 (B) Mannose
 (C) Fructose
 (D) Hydrolytic product of sucrose
- 301. The carbohydrate reserved in human body is**
 (A) Starch (B) Glucose
 (C) Glycogen (D) Inulin
- 302. A disaccharide linked by α -1-4 Glycosidic linkages is**
 (A) Lactose (B) Sucrose
 (C) Cellulose (D) Maltose

ANSWERS

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

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

EXPLANATIONS FOR THE ANSWERS

7. A Polysaccharides are polymers of monosaccharides. They are of two types— homopolysaccharides that contain a single type of monosaccharide (e.g., starch, insulin, cellulose) and heteropolysaccharides with two or more different types of monosaccharides (e.g., heparin, chondroitin sulfate).
30. B Mutarotation refers to the change in the specific optical rotation representing the interconversion of α - and β - anomers of D-glucose to an equilibrium.
48. A Starch is a polysaccharide composed of D-glucose units held together by α -glycosidic bonds, (α 1 \rightarrow 4 linkages; at branching points α 1 \rightarrow 6 linkages).
71. A Hyaluronic acid is the ground substance of synovial fluid of joints. It serves as lubricants and shock absorbant in joints.
93. A The process of shifting a hydrogen atom from one carbon to another to produce enediols is referred to as tautomerization.
117. A Mucopolysaccharides (commonly known as glycosaminoglycans) are heteropolysaccharides composed of sugar derivatives (mainly amino sugars and uronic acids). The important mucopolysaccharides include hyaluronic acid, heparin, chondroitin sulfate, dermatan sulfate and keratan sulfate.
141. B *Molisch test*: It is a general test for the detection of carbohydrates. The strong H_2SO_4 hydrolyses carbohydrates (poly- and disaccharides) to liberate monosaccharides. The monosaccharides get dehydrated to form furfural (from pentoses) or hydroxy methylfurfural (from hexoses) which condense with α -naphthol to form a violet coloured complex.
163. A *Seliwanoff's test*: this is a specific test for ketohexoses. Concentrated hydrochloric acid dehydrates ketohexoses to form furfural derivatives which condense with resorcinol to give a cherry red complex.
187. A *Rothera's test*: Nitroprusside in alkaline medium reacts with keto group of ketone bodies (acetone and acetoacetate) to form a purple ring. This test is not given by β -hydroxybutyrate.
203. D Two specific transport systems are recognized for the entry of glucose into the cells.
- (a) *Insulin-independent transport*: This is a carrier mediated uptake of glucose which is not dependent on the hormone insulin. This operates in hepatocytes, erythrocytes and brain.
- (b) *Insulin-dependent transport*: This occurs in muscle and adipose tissue.
230. D Hexokinase and glucokinase are involved in the phosphorylation of glucose to glucose 6-phosphate. The enzyme hexokinase, present in almost all the tissues, catalyses the phosphorylation of other hexose also (fructose, mannose). It has low K_m for substrates (about 0.1 mM) and is inhibited by glucose 6-phosphate. In contrast, glucokinase is present in liver, catalyses the phosphorylation of only glucose, has high K_m for glucose (10 mM)

- and is not inhibited by glucose 6-phosphate.
251. D The three enzymes namely hexokinase (or glucokinase), phosphofructokinase and pyruvate kinase, catalyzing the irreversible reactions regulate glycolysis. Among these, phosphofructokinase is the most regulatory. It is an allosteric enzyme inhibited by ATP, citrate and activated by AMP and Pi.
275. D The inhibition of glycolysis by oxygen is referred to as Pasteur effect. This is due to inhibition of the enzyme phosphofructokinase by ATP and citrate (formed in the presence of O₂)
291. D The cycle involving the synthesis of glucose in liver from the skeletal muscle lactate and the reuse of glucose thus synthesized by the muscle for energy purposes is known as Cori Cycle.

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