

# MULTIPLE CHOICE QUESTIONS

DEPARTMENT OF HUMAN PHYSIOLOGY  
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- Ribozymes are
  - RNA acting as enzymes
  - Ribose sugar acting as enzyme
  - Antibodies acting as enzymes
  - Protein acting as enzyme
- Holoenzyme is made of
  - Apoenzyme and Zymogen
  - Apoenzyme and Co-enzyme
  - Co-enzyme and Prosthetic group
  - Prosthetic group and Co-factor
- Which of the following organelle is called 'Suicidal Bag'
  - Mitochondria
  - Endoplasmic reticulum
  - Lysosome
  - Ribosome
- Bile salt \_\_\_\_\_ surface tension
  - Increases
  - Decreases
  - Both a and b
  - None of the above
- Most abundant blood cells in the human body are
  - WBCs
  - RBCs
  - Platelets
  - Plasma Cells
- Number of iron atoms in one haemoglobin molecule are
  - 1
  - 3
  - 4
  - 8
- Example of a Pro-enzyme
  - Pepsinogen
  - Trypsin
  - Chymotrypsin
  - Lysine
- Abzymes are
  - Proteins
  - DNAs
  - RNAs
  - Antibodies
- Which of the following is not a co-enzyme-
  - NAD
  - NADP
  - FAD
  - Mn<sup>++</sup>
- Which enzymes do not require co-enzymes for their activity ?
  - The extracellular enzymes
  - The intracellular Enzymes
  - The mitochondrial enzymes
  - The Proenzymes
- What are ribozymes ?
  - RNA acting as enzymes
  - Protein acting as enzymes
  - Ribose sugar acting as enzymes
  - Antibodies acting as enzymes
- Activity of allosteric enzymes are influenced by
  - Allosteric modulators
  - Allosteric site
  - Catalytic site
  - None of the above
- Feed back inhibition means-
  - Initial product inhibition
  - End Product inhibition
  - Enzymatic induction
  - None of the above

14. In competitive inhibition, inhibitors bears a close structural similarity with the
- Co-enzyme
  - Co-factor
  - Prosthetic group
  - Substrate
15. Enzyme acts best at a particular temperature called
- Catalytic Temperature
  - At normal Body temperature
  - Optimum temperature
  - None of the above
16. "Ping Pong" reaction is the other name for
- Single-substrate reaction
  - Single-displacement bi-substrate reaction
  - Double-displacement bi-substrate reaction
  - Lysine
17. Uncatalyzed reaction shows \_\_\_\_\_ activation energy
- Lower
  - Higher
  - Moderate
  - Optimum
18. Lock and Key model is also known as
- Template model
  - Induced fit model
  - Khosland's Model
  - Enzyme-substrate interaction model
19. Which bond is not associated with Enzyme-substrate interaction -
- Hydrogen bonds
  - Ionic bonds
  - Di-sulfide bonds
  - Van deer Waal's force of attraction
20. Which of the following statement is incorrect
- Enzymes are protein in nature
  - Enzymes are colloidal in nature
  - Enzymes are thermolabile
  - Enzymes are inorganic catalyst
21. Apoenzymes dissociates from co-enzymes due to
- Change in pH
  - Change in temperature
  - Change in substrate concentration
  - Change in inhibitor concentration
22. Which of the following enzyme inhibitions shows decreased Km Value ?
- Competitive inhibition
  - Un-competitive inhibition
  - Non-competitive inhibition
  - Feed back inhibition
23. Reversible covalent modification involves
- Activation of proenzymes
  - Inhibition of proenzymes
  - Denaturation of proenzymes
  - None of the above
24. Amount of total blood volume in an individual is approximately-
- 50 ml/Kg body weight
  - 60 ml/Kg body weight
  - 90 ml/Kg body weight
  - 80 ml/Kg body weight
25. Normal blood pH is
- 7.3
  - 7.2
  - 7.4
  - 8.4
26. Life span of RBC is
- 120 days
  - 122 days
  - 124 days
  - 130 days
27. Haematocrit value is the ratio of
- WBC to plasma
  - Platelets to plasma
  - RBCs to plasma
  - Total blood cells to plasma
28. Plasma represents \_\_\_\_\_ percent of total blood volume
- 35
  - 45
  - 55
  - 5

29. Normal amount of plasma protein ranges from
- 2.2-4.3 gm%
  - 4.4-6.3 gm%
  - 6.4-8.3 gm%
  - 8.4-10.2 gm%
30. Which component of protein contribute to maximum percentage to total plasma protein
- Albumin
  - Globulin
  - Fibrinogen
  - Prothrombin
31. Serum does not contain
- Calcium
  - Prothrombin
  - Factor VIII
  - Factor-X
32. Combination of haem with O<sub>2</sub> is called
- Oxyhaemoglobin
  - Oxidation
  - Oxygenation
  - Oxidized haem
33. Adult haemoglobin contains \_\_\_\_\_ polypeptide chains
- 2 $\alpha$ ,2 $\gamma$
  - 2 $\alpha$ ,2 $\beta$
  - 2 $\alpha$ ,2 $\delta$
  - 2 $\beta$ ,2 $\gamma$
34. Each haemoglobin molecules carries \_\_\_\_\_ number of O<sub>2</sub> molecules
- 2
  - 4
  - 1
  - 8
35. Each gram% of haemoglobin, when fully saturated, can carry \_\_\_\_\_ ml of O<sub>2</sub>
- 1.34 ml
  - 3.14 ml
  - 4.13 ml
  - 5ml
36. Which of the following mineral is NOT involved in the formation of haemoglobin
- Iron
  - Calcium
  - Cobalt
  - Magnesium
37. In Sickle cell anaemia, the defect lies in which polypeptide
- Alpha chain
  - Beta chain
  - Gamma chain
  - Delta chain
38. Average mean corpuscular diameter is \_\_\_\_\_  $\mu$ m
- 5.1
  - 6.3
  - 7.3
  - 8.5
39. Increase in RBC count beyond million per cu mm is known as
- Anisocytosis
  - Poikilocytosis
  - Polycythemia
  - Leucocytosis
40. During erythropoiesis haemoglobin first appears in
- Early normoblast
  - Intermediate normoblast
  - Late normoblast
  - Pronormoblast
41. During hypoxia Kidney releases
- Renin
  - Renal Erythropoietic factor
  - Erythropoietin
  - None of the above
42. Intrinsic factor is secreted by
- Liver
  - Chief cells of stomach
  - Parietal cells of stomach
  - Beta cells of pancreas
43. Which of the following extrinsic factor is required for maturation of RBCs
- Vit B<sub>12</sub>
  - Folic acid
  - Iron
  - Both (a) and (b)

44. Largest WBCs in peripheral blood is
- Neutrophil
  - Large lymphocyte
  - Monocyte
  - Eosinophil
45. The process by which WBCs squeeze through pores in capillary wall is
- Chemotaxis
  - Pinocytosis
  - Opsonization
  - Diapedesis
46. Smallest blood cell is
- Small lymphocyte
  - Platelet
  - RBC
  - Neutrophil
47. Commonest anaemia in India is
- Pernicious anaemia
  - Sickle cell anaemia
  - Iron deficiency anaemia
  - None of the above
48. Lysosomes are produced by
- Vacuoles
  - Mitochondria
  - Ribosomes
  - Golgi apparatus
49. Which of the following is NOT associated with mitochondria
- ATP production
  - Cristae
  - Stroma
  - Matrix
50. Which of the following statements are incorrect regarding ER?
- The adipose tissue has both SER and RER
  - Plasma cells has RER and SER
  - RBC lacks both RER and SER
  - Hepatocytes has both RER and SER
51. The term ER was coined by
- Camillo Golgi
  - Porter
  - Robert Brown
  - Benda
52. Which of the following organelle has a continuous connection with nuclear membrane
- Golgi apparatus
  - Lysosome
  - RER
  - SER
53. In RER, ribosomes are located on
- the cytoplasmic side
  - on the luminal side
  - both (a) and (b)
  - all throughout
54. Which of the following statements were true regarding ER
- ER provides structural framework to the cell
  - ER acts as intra cellular transporting system
  - SER is involved in the synthesis of lipid
  - All of the above
55. Protein glycosylation occurs in the
- lumen of the mitochondria
  - lumen of rough endoplasmic reticulum
  - lumen of SER
  - lumen of lysosomes
56. Golgi apparatus is absent in
- higher plants
  - yeast
  - bacteria and blue green algae
  - none of the above
57. Which of the following statements are correct regarding Golgi apparatus
- sorting and packaging
  - exocytosis of melanin granules
  - exocytosis of thyroxine hormone
  - all of the above
58. The term Golgi apparatus was coined by

- a. Camillo Golgi  
c. Robert Hook
59.  $F_0-F_1$  Particles are located on  
a. Thylakoids  
c. Golgian vacuoles
60. In mitochondria cristae act as sites for  
a. protein synthesis  
b. phosphorylation of flavoproteins  
c. breakdown of macromolecules  
d. Oxidation–reduction reaction
61. Mitochondrial inner membrane is rich in which phospholipid  
a. Phosphatidyl inositol  
c. Cardiolipin
62. Which of the following is NOT a function of mitochondrion  
a. electron transport and associated ATP production  
b. Fatty acid breakdown  
c. non-shivering thermogenesis  
d. glycolysis and associated ATP production
63. Who coined the term mitochondria  
a. Kolliker  
c. Fleenming
64. Nucleus was first discovered by  
a. Robert Hook  
c. Robert Brown
65. Nucleus are absent in  
a. RBCs and bacterium  
c. RBCs only
66. Nuclear membrane is in continuous connection with  
a. SER  
c. Golgi apparatus
67. The number of nuclear pores depends on  
a. Size of cells  
c. DNA content of the cell
68. The DNA Protein ratio in chromatin is  
a. 3:1  
c. 1:1
69. The function of nucleolus is  
a. RNA synthesis  
c. Histone synthesis
70. The basic protein of the nucleus are  
a. nucleohistones  
c. both (a) and (b)
71. Which of the following organelle is called the “Perinuclear dense bodies”  
a. Lysosomes  
c. Peroxisomes
- b. Robert Brown  
d. Benda
- b. inner mitochondrial membrane  
d. None of the above
- b. Phosphatidyl serine  
d. Phosphatidyl choline
- b. Benda  
d. Robert Brown
- b. Strasburger  
d. None of the above
- b. RBCs, Sieve cells and bacterium  
d. None of these
- b. RER  
d. Lysosomes
- b. Transcriptional activity of the cell  
d. all of the above
- b. 2:1  
d. 4:1
- b. DNA synthesis  
d. Ribosomal subunit synthesis
- b. nuceoprotamines  
d. none of these
- b. Nucleolus  
d. Nucleus

72. Lysosomes are present in all except
- a. muscle cells
  - b. acinar cells
  - c. erythrocytes
  - d. hepatocytes
73. Which of the following is the function of lysosomes
- a. autophagy
  - b. autolysis
  - c. digestion
  - d. all of the above
74. Lysosomes are involved in
- a. Extracellular digestion
  - b. Intracellular digestion
  - c. both (a) and (b)
  - d. none of the above
75. Lysosomal membrane is rich in
- a. cardiolipin
  - b. sialic acid
  - c. sterols
  - d. all of the above
76. Who identified lysosome
- a. Novikoff
  - b. Claude
  - c. Palade
  - d. none of the above
77. All the following has ribosomes except
- a. nucleus
  - b. mitochondrion
  - c. chloroplast
  - d. cytoplasm
78. In 70S ribosome 'S' stands for
- a. S.I unit
  - b. Solubility factor
  - c. Svedberg unit
  - d. None of the above
79. 80S ribosomes are found in
- a. Eukaryotes
  - b. Prokaryotes
  - c. Both eukaryotes and Prokaryotes
  - d. Eukaryotic plant cells
80. The subunits of 80S ribosomes include
- a. 40S and 50S
  - b. 30S and 50S
  - c. 40S and 60S
  - d. 20S and 60S
81. The subunits of 70S ribosomes include
- a. 40S and 50S
  - b. 30S and 40S
  - c. 30S and 50S
  - d. 20S and 50S
82. Which of the following ions are required for binding of ribosomal subunits
- a. Na<sup>+</sup>
  - b. Mg<sup>++</sup>
  - c. Mn<sup>++</sup>
  - d. Fe<sup>++</sup>
83. 70S ribosomes occur in
- a. Viruses
  - b. prokaryotes
  - c. eukaryotic plant cells
  - d. eukaryotic animal cells
84. Ribosomes are made up of
- a. RNA only
  - b. RNA and Proteins
  - c. RNA, DNA and Proteins
  - d. nucleic acids, proteins and lipids
85. The rough ER is specially well developed in cells actively engaged in
- a. Protein synthesis
  - b. Nucleotide synthesis
  - c. Lipid synthesis
  - d. Secretory functions
86. The nucleus contains
- a. Mitochondria
  - b. Golgi apparatus
  - c. Chromosomes
  - d. Lysosomes

87. Plasma membrane is
- Permeable
  - Selectively permeable
  - Impermeable
  - Semi-permeable
88. Most accepted structural model of plasma membrane is
- Sandwich model
  - Unit membrane model
  - Lamellar model
  - Fluid-mosaic model
89. Plasma membrane is composed of
- Glycoproteins
  - Lipoproteins
  - Chromoproteins
  - Lipids
90. Ribosomes contain maximum amount of
- Steroids
  - Lipids
  - RNA
  - DNA
91. Which structure is present in animal cell but is absent from plant cell ?
- Centrioles
  - Golgi apparatus
  - Mitochondria
  - Endoplasmic reticulum
92. A unit membrane is about :
- 50-60 Å thick
  - 60-75 Å thick
  - 75-100 Å thick
  - 100-120 Å thick
93. The enzymes which break up starch into sugar are called
- Hydrolases
  - Amylases
  - Lipases
  - Nucleases
94. Apoenzyme is a
- Protein
  - Carbohydrate
  - Vitamin
  - Amino acid
95. The enzyme which break up nucleic acid into nucleotides are called
- Nucleases
  - Amylases
  - Proteases
  - Hydrolases
96. Coenzyme is :
- Always a protein
  - Often a metal
  - Always an inorganic compound
  - Often a vitamin
97. Enzymes are named after their substrates by adding suffix :
- in
  - ase
  - ose
  - sin
98. Enzyme exist in the cells as-
- Solid
  - Crystals
  - Colloid
  - None of the above
99. An enzyme brings about :
- Reduction in activation energy
  - Increase in reaction time
  - Increase in activation energy
  - All the above
100. Which of the following statement is "NOT" correct
- All enzymes are thermolabile
  - All enzymes are biocatalysts
  - All enzymes are proteins
  - All proteins are enzymes
101. Who discovered blood groups
- F. Galton
  - Carl Linnaeus

- c. Edward Jenner
102. Enzymes bringing about hydrolysis of esters and peptides are :
- a. Transferases  
c. Hydrolases
103. Aerobic respiration is performed by :
- a. Glyoxisomes  
c. Lysosomes
104. Bile reduces the surface tension and causes
- a. Emulsification of fat  
c. Absorption of fat
105. Dialysis causes
- a. Separation of colloids from crystalloids  
c. Precipitation of colloids
106. Ultrafiltration helps in
- a. Formation of Glomerular filtrate  
c. Accumulation of proteins
107. pH of RBC is lower due to
- a.  $\text{Na}^+ - \text{K}^+$  Pump action  
c. Efflux of  $\text{OH}^-$  from RBC
108. Gibb's Donnan effect creates
- a. Diffusion  
c. Osmotic pressure
109. Transmembrane potential results due to
- a. Donnan Effect  
c. Retention of anions inside the membrane
110. Rate of diffusion of a substance depends on
- a. Presence of semi-permeable membrane  
c. Concentration of solvent
111. Gibb's Donnan effect is seen on the uneven distribution of
- a. Diffusible ions  
c. Only protein ions
112. Nernst equation deals with
- a. Oxygen uptake of the body  
c. Plasma bicarbonate level
113. Homeostasis means
- a. Control of internal environment of the body  
c. Constant environment of the body
114. Diffusion is more rapid in
- a. Solid  
c. Gas
115. In Osmosis, movement of \_\_\_\_\_ occurs through the semi-permeable membrane
- a. Solvent  
c. Both (a) and (b)
- d. C. Landsteiner
- b. Lyases  
d. All of the above
- b. Mitochondria  
d. Chloroplast
- b. Digestion of fat  
d. All of the above
- b. Purification of colloids  
d. None of the above
- b. Formation of urine  
d. Separation of vitamins
- b. Gibb's Donnan Effect  
d. None of the above
- b. Surface tension  
d. None of the above
- b. Influx and efflux of oppositely charged ions  
d. All the above
- b. Concentration gradient of solute  
d. Concentration of ions
- b. Non-diffusible ions  
d. Both (a) and (b)
- b. Cellular ATP level  
d. Amount potential difference
- b. Adaptation with the environment  
d. All of the above
- b. Liquid  
d. Mixture of liquid and gas
- b. Solute  
d. All the above
116. Viscosity of blood increases with rise in



- a. Albumin  
c. Fibrinogen
- b. Globulin  
d. Prothrombin
117. Osmotic pressure across the capillary wall is exerted by  
a. Size of the molecule  
c. Concentration of the molecule
- b. Shape of the molecule  
d. All the above
118. Effect of temperature on viscosity involves  
a. Increase in viscosity  
c. No change
- b. Decrease in viscosity  
d. Both (a) and (b)
119. Ultrafiltration takes place in the presence of  
a. Hydrostatic pressure  
c. Crystalloid
- b. Colloid  
d. None of the above
120. pH means  
a.  $-\log [H^+]$   
c.  $-\log [H]$
- b.  $-\log_{10} [H^+]$   
d.  $\log [H^+]$
121. Microcytic anaemia develops in  
a. Vit B<sub>12</sub> deficiency  
c. Both (a) and (b)
- b. Folic acid deficiency  
d. None of the above
122. Extrinsic system of blood clotting is initiated by  
a. Factor-III  
c. Factor-II
- b. Factor-VIII  
d. Factor-I
123. One of the following is NOT an anticoagulant  
a. Heparin  
c. Antithrombin-III
- b. Protein-C  
d. Thrombin
124. Following are the membrane bound cell organelles except  
a. Endoplasmic reticulum  
c. Ribosomes
- b. Lysosome  
d. Peroxisome
125. The intrinsic protein present in the cell membrane mainly functions as  
a. Enzymes  
c. Pores
- b. Carrier  
d. Channels

## ANSWERS

1.(a) 2.(b) 3.(c) 4.(b) 5.(b) 6.(c) 7.(a) 8.(d) 9.(d) 10.(a) 11.(a) 12.(a) 13.(b) 14.(d)  
15.(c) 16.(c) 17.(b) 18.(a) 19.(c) 20.(d) 21.(a) 22.(a) 23.(a) 24.(d) 25.(c) 26.(a) 27.(c) 28.(c)  
29.(a) 30.(a) 31.(a) 32.(a) 33.(b) 34.(d) 35.(b) 36.(d) 37.(b) 38.(c) 39.(c) 40.(b) 41.(b) 42.(c)  
43.(d) 44.(c) 45.(d) 46.(b) 47.(c) 48.(d) 49.(c) 50.(a) 51.(b) 52.(c) 53.(a) 54.(d) 55.(b) 56.(c)  
57.(d) 58.(a) 59.(b) 60.(d) 61.(c) 62.(d) 63.(b) 64.(c) 65.(b) 66.(b) 67.(b) 68.(c) 69.(d) 70.(c)  
71.(a) 72.(c) 73.(d) 74.(c) 75.(b) 76.(a) 77.(a) 78.(c) 79.(a) 80.(c) 81.(c) 82.(b) 83.(b) 84.(b)  
85.(a) 86.(c) 87.(b) 88.(d) 89.(b) 90.(c) 91.(a) 92.(c) 93.(b) 94.(a) 95.(a) 96.(d) 97.(b) 98.(c)  
99.(a) 100.(d) 101.(d) 102.(c) 103.(b) 104.(d) 105.(a) 106.(a) 107.(b) 108.(c) 109.(a) 110.(b) 111.(a)  
112.(d) 113.(c) 114.(c) 115.(a) 116.(a) 117.(c) 118.(d) 119.(a) 120.(b) 121.(c) 122.(a) 123.(d) 124.(c)  
125.(a)

126. Plasma represents \_\_\_\_\_% of total blood volume
- 35
  - 45**
  - 55
  - 65
127. Serum differs from plasma in that
- Serum is plasma minus fibrinogen and clotting factors**
  - Serum is clear, straw coloured fluid
  - Serum has high histamine content
  - All of the above
128. Hypoproteinaemia produces oedema by
- Increasing hydrostatic pressure at capillary arteriolar end
  - Increasing interstitial fluid osmotic pressure
  - Decreasing colloidal osmotic pressure across the capillary wall**
  - All of the above
129. Viscosity of blood increased with rise in \_\_\_\_\_ levels
- Albumin**
  - Globulin
  - Fibrinogen
  - Prothrombin
130. Which of the following promotes rouleaux formation
- Albumin
  - Pre-albumin
  - Fibrinogen**
  - Prothrombin
131. Haemoglobin has \_\_\_\_\_ times affinity for CO than O<sub>2</sub>
- 50
  - 100
  - 250**
  - 320
132. Iron content of haemoglobin is
- 0.33%**
  - 1%
  - 3%
  - 9%
133. Old RBCs are destroyed in
- Lungs
  - Liver
  - Spleen
  - All of the above**
134. Tissue macrophage system includes
- Alveolar macrophage in lungs
  - Kuffer cells of the liver
  - Osteoclast in bone
  - All of the above**
135. Most common form of Thalasemia is
- $\alpha$
  - $\beta$ -major
  - $\beta$ -minor**
  - $\gamma$
136. Thalasemia is characterized by
- Deficient production of  $\alpha$  and  $\beta$  chains**
  - Defect in the polypeptide chains
  - Normal globin genes
  - All of the above
137. In sickle cell anaemia the defect lies in which polypeptide chain-
- $\alpha$ -chain
  - $\beta$ -chain**
  - $\gamma$ -chain
  - $\delta$ -chain
138. Average mean corpuscular diameter is \_\_\_\_\_  $\mu\text{m}$ .
- 5.1
  - 6.3
  - 7.3**
  - 8.5

139. Average volume of an RBC is \_\_\_\_\_  $\mu\text{m}^3$   
a. 72  
b. **86**  
c. 96  
d. 120
140. Average RBC count in an adult male is  
a. 4.5 million/ $\text{mm}^3$   
b. 5 million/ $\text{mm}^3$   
c. **5.5 million/ $\text{mm}^3$**   
d. 6 million/ $\text{mm}^3$
141. MCHC is  
a. Volume of single RBC  
b. Average amount of haemoglobin in a single RBC in picogram  
c. **Average amount of haemoglobin in a single RBC in percentage**  
d. never less than 38%
142. Normal range of MCHC is  
a.  $10 \pm 5$  gm%  
b.  $25 \pm 2$  gm%  
c.  **$35 \pm 3$  gm%**  
d.  $40 \pm 3$  gm%
143. What is the maximum concentration of haemoglobin normally found in RBCs  
a. 10 %  
b. 22 %  
c. 30 %  
d. **38 %**
144. Erythropoiesis is completed in \_\_\_\_\_ days  
a. 3  
b. **7**  
c. 14  
d. 20
145. True about bilirubin \_\_\_\_\_  
a. **Clinically jaundice occurs if level is more than 2mg/100 ml**  
b. Is same as biliverdin  
c. Normal serum level is 1.5 mg%  
d. Is secreted in stool as such
146. Neonatal jaundice-  
a. Is always fatal  
b. Normally appears on 10<sup>th</sup> day of life  
c. **Normally appears on 2<sup>nd</sup> or 3<sup>rd</sup> day of life**  
d. Both (a) and (b)
147. Clinically Jaundice appears in infants when serum bilirubin rises beyond  
a. 1 mg%  
b. 2-3 mg%  
c. 4 mg%  
d. **5 mg%**
148. Which is not a physiological cause of leucocytosis-  
a. Newborn  
b. Stress  
c. **Pyogenic infection**  
d. Exercise
149. All may be the cause of leucopenia except  
a. Bone marrow depression  
b. **Early morning hours**  
c. Typhoid fever  
d. Starvation
150. Not true about leukaemia is  
a. Cancerous condition of blood  
b. **Always associated with leucocytosis**  
c. Associated with immature WBCs in the peripheral smear  
d. Associated with tremendous proliferation of myeloid series of cells in the bone marrow
151. Thrombocytopenia is commonly occur in  
a. Splenectomy  
b. After Surgery  
c. **Dengue fever**  
d. Stress condition
152. In purpura

- a. Platelets count may be low  
c. CT is normal but BT increases
153. Carbaminohaemoglobin is formed when  
a. **CO<sub>2</sub> reacts with haemoglobin**  
c. Either reduced or oxygenated haemoglobin is exposed to oxidizing agent  
d. Oxygen has been removed from haemoglobin
154. Haemophilia is  
a. Autosomal dominant  
c. **X-linked recessive**
155. Blood group antigens are  
a. Carried by sex chromosomes  
c. Attached to haemoglobin molecule
156. Rh antigen is  
a. A  
c. C
157. True about Rh factor  
a. **Has no naturally occurring antibody**  
c. Not important for blood transfusion
158. ESR is the  
a. Erythrocyte Solubility reaction  
c. Erythrocyte Sedimentation Co-efficient
159. ESR is determined by  
a. Wintrobe's method  
c. **Both (a) and (b)**
160. Transitional epithelium is found on  
a. Stomach  
c. Liver
161. Histamine secreting cells are found in  
a. **Connective tissues**  
c. Lungs
162. Characteristic of simple epithelium is that they  
a. are arranged indiscriminately  
b. Continue to divide and help in organ function  
c. **Make a definite layer**
163. Areolar connective tissue joins  
a. Haemoglobin  
c. Myoglobin
164. Haversian canals occur in  
a. **Humerus**  
c. Clavicle
165. The surface of simple squamous epithelium is  
a. Permeable  
b. **Selectively permeable**
- b. Capillary contractility is defective  
d. **All of the above**
- b. CO reacts with haemoglobin  
d. X-linked dominant
- b. Attached to plasma proteins  
d. **Found in saliva**
- b. B  
d. **D**
- b. Seen only in human  
d. None of the above
- b. Erythrocyte Solubility Index  
d. **Erythrocyte Sedimentation Rate**
- b. Westergren's method  
d. None of the above
- b. Lungs  
d. **Urinary bladder**
- b. Nervous tissues  
d. Muscular tissue
- d. None of the above
- b. Hirudin  
d. **Histamine**
- b. Pubis  
d. Scapula

- c. Impermeable  
d. All of these
166. The type of joint that is distinguished by having a fluid-filled joint cavity is a \_\_\_\_\_ joint  
a. Fibrous  
b. Cartilaginous  
c. **Synovial**  
d. Suture
167. \_\_\_\_\_ joints are capable of side-to side and back – and –forth movements, with only slight rotation  
a. Hinge  
b. **Gliding**  
c. Pivot  
d. Condylloid
168. In a \_\_\_\_\_ joint, an oval surface fits into a concave depression, these joints are said to be biaxial  
a. Hinge  
b. Saddle  
c. **Condylloid**  
d. Pivot
169. The shoulder and hip joints are of this type-  
a. **Ball and Socket**  
b. Pivot  
c. Saddle  
d. Gliding
170. What type of basic tissue type is cartilage  
a. Muscle  
b. Nervous tissue  
c. Cartilage  
d. **Connective tissue**
171. How many types of cartilage are there ?  
a. 1  
b. 2  
c. **3**  
d. 4
172. Which type of cartilage is found in the walls of the Eustachian tube ?  
a. Hyaline cartilage  
b. **Elastic cartilage**  
c. Fibro cartilage  
d. All of the above
173. Which type of cartilage forms the skeleton of the fetus ?  
a. **Hyaline cartilage**  
b. Elastic cartilage  
c. Fibro cartilage  
d. All of the above
174. Which type of cartilage forms the intervertebral disc  
a. Hyaline cartilage  
b. Elastic cartilage  
c. **Fibro cartilage**  
d. All of the above
175. Osteoarthritis involves all except  
a. Hip joint  
b. Knee joint  
c. Distal interphalangeal joints  
d. **Metacarpophalangeal joint of the thumb**
176. Osteoporosis results in  
a. Increase in skeletal mass  
b. Decreased in the amount of mineralized bone  
c. **No change in the mineral to matrix ratio**  
d. Decrease in the cortical diameter of a long bone
177. Rheumatoid arthritis  
a. Is a disease of the articular cartilage  
b. Typically results in hyperostosis around the joints  
c. Commonly causes early fibrosis of the synovium  
d. **Radio-graphically is characterized by juxta-articular osteopenia**
178. During chondrogenesis, the mesenchymal cells first differentiate in to  
a. Osteoblasts  
b. Chondrocytes  
c. **Chondroblasts**  
d. Chondroclasts

179. Joints are region where
- One bone meets another bone
  - Two or more bones meet**
  - Two or more ligament meets
  - Two or more tendons meet
180. What is compact bone ?
- Dense bone**
  - Spongy bone
  - Immature bone
  - Hollow bone
181. The organic component of bone matrix is produced by
- Osteoblasts**
  - Osteocytes
  - Osteoclasts
  - Chondrocytes
182. Which of the following cell types is responsible for synthesizing the organic component of cartilage matrix ?
- Osteocytes
  - Chondrocytes
  - Osteoblasts
  - Chondroblasts**
183. The outer covering of each bone is made from connective tissue is called -
- Perichondrium
  - Periosteum**
  - Diaphysis
  - Outer layer
184. The human skeleton is made up of
- 206 bones**
  - 205 bones
  - 226 bones
  - 200 bones
185. Which of the following cells lacks cytoskeleton
- Eukaryotic plant cell
  - Prokaryotic bacterial cells**
  - Both (a) and (b)
  - Prokaryotic and Eukaryotic animal cells
186. Cytoskeletons are chemically
- Nucleoprotein filament
  - Nucleoprotein filament and lipids
  - Protein filaments**
  - None of the above
187. The cytoskeleton consists of
- Microtubules
  - Microfilaments
  - Intermediate filament
  - All of these**
188. Microfilaments are made up of
- Actin**
  - Tubulin and actin
  - Desmin
  - Vimetin
189. DNA replication occurs in
- S-Phase**
  - G-phase
  - G2-Phase
  - M-Phase
190. Pairing of homologous chromosomes can be seen during
- Zygotene**
  - Diplotene
  - Leptotene
  - Pachytene
191. During meiosis chiasmata are observed at
- Diplotene
  - Zygotene
  - Leptotene
  - Pachytene**
192. During which stage of prophase-I the crossing over take place
- Zygotene
  - Diplotene
  - Leptotene
  - Pachytene**
193. Condensation of chromosome with visible centromere occurs during

- a. G1- phase  
**c. M-Phase**
- b. G2- phase  
d. S-phase
194. The end result of a mitotic cell division is  
**a. equal distribution of chromatids into two daughter cells**  
b. equal distribution of chromosomes into two daughter cells  
c. distribution of homologous chromosomes into two daughter cells  
d. random distribution of two chromatids into two daughter cells
195. Which of the following statements concerning the role of  $\text{Ca}^{+2}$  in the contraction of skeletal muscle is correct ?  
a. The mitochondria act as a store of  $\text{Ca}^{+2}$  for the contractile process  
b.  $\text{Ca}^{+2}$  entry across the plasma membrane is important sustaining the muscle contraction  
**c. A rise in intracellular  $\text{Ca}^{+2}$  allows actin to interact with myosin**  
d. The tension of a skeletal muscle fiber is partly regulated by G- proteins
196. The functional contractile unit of muscle contraction in striated muscle is  
a. Myofibril  
**c. Sarcomere**  
b. I-band  
d. Z-band
197. The contractile protein of skeletal muscle involving ATPase activity is  
a. Actin  
**b. Myosin**  
c. Troponin  
d. Tropomyosin
198. Muscle fatigue sets in due to non-availability of  
a. Calcium  
**b. ATP**  
c. Actin binding site  
d. Mg cofactor
199. Muscles get fatigue due to accumulation of  
**a. Lactic acid**  
b. ATP  
c. Phosphate molecules  
d. Carbon dioxide
200. Light band has which of the following filament protein ?  
a. Myosin  
**b. Actin**  
c. Myosin and actin  
d. None of these
201. In skeletal muscle intracellular fluid between the myofibrils is  
a. Sarcomere  
**b. Sarcoplasm**  
c. Cytoplasm  
d. Matrix
202. The dark bands of skeletal muscle are  
**a. A-bands**  
b. I-bands  
c. H-zone  
d. Z-disc
203. In skeletal muscle, the length of myosin filament is  
**a. 1.6  $\mu\text{m}$**   
b. 2  $\mu\text{m}$   
c. 1.6 nm  
d. 2 nm
204. Which of the following is NOT a bone cell  
a. Osteoblast  
b. Osteoclasts  
c. Osteocytes  
**d. Chondrocyte**
205. Which of the following statement is not true about allosteric enzymes  
a. Allosteric enzyme are regulatory enzymes  
b. Allosteric enzymes have allosteric site  
c. Allosteric enzymes have regulatory site  
**d. In allosteric enzymes effector binds to the active site**
206. The unit of Carbohydrates is

- a) Disaccharide  
c) Oligosaccharide
207. Disaccharide consists of  
a) **Two molecules of monosaccharides**  
c) Four molecules of monosaccharides
208. The basic unit of protein molecule is  
a) Peptides  
c) Alanine
209. Large molecules that contain carbon and are held together by covalent bonds are categorized as  
a. proteins.  
c. nucleic acids.
210. Which of the following is not a macromolecule?  
a. RNA  
c. A protein
211. The bonds that form between the atoms of polymeric macromolecules are \_\_\_\_\_ bonds.  
a. hydrogen  
c. disulfide
212. Which of the following does not represent a correct monomer/polymer pairing?  
a. Monosaccharide/polysaccharide  
c. **Triglyceride/cellulose**
213. Polymerization reactions in which polysaccharides are synthesized from monosaccharides  
a. require the formation of phosphodiester bonds between the amino acids.  
b. are hydrolysis reactions.  
c. depend upon van der Waals forces to hold the amino acids together.  
d. **result in the formation of water**
214. During the formation of a peptide linkage, a(n) \_\_\_\_\_ is formed.  
a. **molecule of water**  
c. hydrophobic bond
215. Which of the following is responsible for making every amino acid unique?  
a. Amino group  
c. Carboxyl group
216. Enzymes are  
a. DNA  
c. carbohydrates
217. A protein can best be defined as a polymer  
a. **of amino acids**  
b. containing one or more polypeptide chains.  
c. containing 20 amino acids
218. Which of the following amino acids does not have an optical isomer?  
a. Arginine  
c. Alanine
219. Leucine and valine do not interact with water; therefore, they  
a. are hydrophilic  
c. have sulfur atoms in their side chains
- b) **Monosaccharide**  
d) Polysaccharide
- b) Three molecules of monosaccharides  
d) Five molecules of monosaccharides
- b) **Amino acid**  
d) Albumins
- b. polymers.  
d. **macromolecules**
- b. DNA  
d. **Salt**
- b. peptide  
d. **covalent**
- b. Amino acid/protein  
d. Nucleotide/nucleic acid
- b. lipids.  
d. **proteins**
- d. containing 20 peptide linkages.
- b. Cysteine  
d. **Glycine**
- b. **are nonpolar**  
d. are electrically charged.



220. Aspartate and glutamate are highly soluble in water; therefore, they
- a. are hydrophobic
  - b. have sulfur atoms in their side chains.
  - c. **have electrically charged side chains**
  - d. are nonpolar
221. Amino acids can be classified by the
- a. number of monosaccharides they contain
  - b. number of carbon-carbon double bonds in their fatty acids.
  - c. number of peptide bonds they can form.
  - d. **characteristics of their side chains, or "R" groups**
222. What type of amino acid side chains would you expect to find on the surface of a protein embedded in a cell membrane?
- a. Cysteine
  - b. **Hydrophobic**
  - c. Hydrophilic
  - d. Charged
223. Peptide chains have a(n) \_\_\_\_\_ and a(n) \_\_\_\_\_ end.
- a. start; stop
  - b. +; -
  - c. **N terminus; C terminus**
  - d. 5'; 3'
224. An amino acid that is small enough to fit into tight corners of protein molecules is
- a. proline
  - b. **glycine.**
  - c. cysteine
  - d. asparagine.
225. The shape of a folded protein is often determined by
- a. its tertiary structure.
  - b. **the sequence of its amino acids.**
  - c. whether the peptide bonds have  $\alpha$  or  $\beta$  linkages.
  - d. the number of peptide bonds.
226. The tertiary structure of a protein is determined by its
- a. interactions among R groups
  - b. right-handed coil.
  - c. **hydrogen bonding**
  - d. branching.
227. A  $\beta$  pleated sheet organization in a polypeptide chain is an example of \_\_\_\_\_ structure.
- a. primary
  - b. **secondary**
  - c. tertiary
  - d. quaternary
228. Which of the following protein structures is destroyed by denaturation?
- a. Primary
  - b. Secondary
  - c. Tertiary
  - d. **Both b and c**
229. The atoms that make up carbohydrates are
- a. C, H, and N
  - b. C and H.
  - c. C, H, and P
  - d. **C, H, and O.**
230. Glucose and fructose both have the formula  $C_6H_{12}O_6$ , but the atoms in these two compounds are arranged differently. Glucose and fructose are therefore
- a. **isomers**
  - b. polysaccharides.
  - c. oligosaccharides
  - d. pentoses.
231. The monomers that make up polymeric carbohydrates like starch are called
- a. nucleotides
  - b. trisaccharides.
  - c. **monosaccharides**
  - d. nucleosides.

232. A simple sugar with the formula  $C_5H_{10}O_5$  can be classified as a
- a. hexose
  - b. polysaccharide.
  - c. disaccharide
  - d. **pentose.**
233. DNA and RNA both include
- a. **pentoses**
  - b. hexoses.
  - c. fructoses
  - d. maltoses.
234. Lactose, or milk sugar, which is composed of one glucose unit and one galactose unit, can be classified as a
- a. **disaccharide**
  - b. hexose.
  - c. pentose
  - d. polysaccharide.
235. A molecule that has an important role in long-term storage of energy is
- a. a steroid
  - b. RNA.
  - c. **glycogen**
  - d. an amino acid.
236. Asymmetric carbon leads to
- a. **Stereoisomerism**
  - b. Aldose-ketose isomerism
  - c. Pyranose-furanose isomerism
  - d. All of the above
237. The main function of cellulose, the most abundant organic compound on Earth, is
- a. to store genetic information
  - b. as a storage compound for energy in plant cells.
  - c. as a storage compound for energy in animal cells.
  - d. **to provide mechanical strength to plant cell walls.**
238. Lipids are
- a. insoluble in water
  - b. hydrophobic.
  - c. important constituents of biological membranes
  - d. **All of the above**
239. Essential fatty acids are
- a. Linoleic acid
  - b. Arachidonic acid
  - c. Linolenic acid
  - d. **All of these**
240. Maltose is composed of which two sugars?
- a) **Glucose and Glucose**
  - b) Glucose and Fructose
  - c) Glucose and Galactose
  - d) Fructose and Galactose
241. A pentosesugar present in the heart muscle is-
- a) Xylose
  - b) Xylulose
  - c) **Lyxose**
  - d) Aldose
242.  $\alpha$ -D Glucose and  $\beta$ -D glucose are-
- a) Epimers
  - b) **Anomers**
  - c) Keto- Aldose Isomers
  - d) Optical isomers
243. Glucose can have ——— isomers due to the presence of 4 asymmetric carbon atoms-
- a) 4
  - b) 8
  - c) 12
  - d) **16**
244. Galactose and Glucose are-
- a) **Epimers**
  - b) Anomers

c) Isomers

d) Ketose- Aldose isomers

245. The compounds having same structural formula but differing in configuration around one carbon atom are called-

a) Optical isomers

b) Anomers

c) Stereo isomers

d) **Epimers**

246. A Polysaccharide formed by  $\beta 1 \rightarrow 4$  Glycosidic linkages is-

a) Starch

b) Glycogen

c) Dextrin

d) **Cellulose**

247. Invert sugar is-

a) Starch

b) Fructose

c) Glucose

d) **Hydrolytic product of Sucrose**

248. The polysaccharide found in the exoskeleton of insects is-

a) Hyaluronic acid

b) **Chitin**

c) Cellulose

d) Chondrosamine

249. The typical cyclical structure of Glucose is  $\alpha$  and  $\beta$  D-

a) **Glucopyranose**

b) Glucofuranose

c) Glucoside

d) Glucosamine

250. Which of the following monosaccharides is *not* a carboxylic acid?

a) Glucuronate

b) **Glucose**

c) Gluconate

d) Muramic acid

251. Which of following is an anomeric pair?

a) D-glucose and L-glucose

b) D-glucose and D-fructose

c)  **$\alpha$ -D-glucose and  $\beta$ -D-glucose**

d)  $\alpha$ -D-glucose and  $\beta$ -L-glucose

252. Which of the following monosaccharides is *not* an aldose?

a) Ribose

b) Glucose

c) **Fructose**

d) Glyceraldehyde

253. In which type of enzyme inhibition the original  $V_{max}$  can be regained

a. Non-competitive inhibition

b. Un-competitive inhibition

c. **Competitive inhibition**

d. None of the above

254. Colloids are

a) **Two phase system**

b) One -Phase system

c) Combination of Sol and Gel

d) Mixture of solute and solvent

255. Emulsoid are called

a) Gel phase of colloid

b) Sol phase of colloid

c) **Protective colloids**

d) None of the above

256. Each colloid particle has a definite charge, it may be cation or anion so fixed layer constitute by

a) Single charged layer

b) **Double opposite charged layer**

c) Mobile and immobile layer

d) None of the above

257. Electrophoresis results

a) Purification of colloids

b) Separation of Protein

c) Separation of cation and anion charges

d) **All of the above**

258. Gall bladder stone and urinary bladder stones are formed due to

a) Insufficient amount of bile

b) Excessive deposition of cholesterol and Iron

- c) Excess amount of fat in the body  
**d) Absence of protective colloid**
259. Example of protective colloids are  
 a) Milk  
 c) Sodium chloride  
 b) Gold sol  
**d) Gelatin**
260. On the basis of the state of the dispersion medium colloids are  
 a) **Sol and gel type**  
 c) saturated and unsaturated type  
 b) Lyophilic and lyophobic type  
 d) None of the above
261. Osmotic pressure of colloid solution depends on  
 a) **number of the colloid particle**  
 c) Shape of colloid particles  
 b) Size of colloid particles  
 d) None of the above
262. Lyophilic colloid particles holds itself a immobile shell like layer of the dispersion medium, this results  
 a) Aggregation of colloid particles  
 c) Maintain colloidal nature of the solution  
**b) Prevent precipitation**  
 d) None of the above
263. Brownian movement results from  
 a) Movement of liquid molecule of dispersion medium  
**b) Collision of colloid molecules with each other**  
 c) Repulsion of like charged particles  
 d) None of the above
264. Helmholtz- Gouy Electrical double layer is formed by  
 a) Stern potential  
 c) Zeta potential  
**b) Mobile and immobile layer**  
 d) None of the above
265. Zeta potential serves as a  
 a) **measure of stability of colloid particles**  
 c) Formation of lyophobic sol  
 b) Possibility of coagulation of colloid  
 d) None of the above
266. Stern potential are formed  
 a) **Between particle surface and first immobile layer of ions**  
 b) Between immobile and mobile layer  
 c) Both (a) and (b)  
 d) None of the above
267. Isotopes have  
 a) **Same atomic number but different atomic weight**  
 b) Different atomic number and same atomic weight  
 c) Substances of same chemical element  
 d) All of the above
268. Radioactive isotopes have  
 a) **Unstable nuclei**  
 c) None of the above  
 b) Stable nuclei  
 d) All of the above
269. Due to unstable nuclei the radioactive isotopes undergoes decay spontaneously emitting radiation in the form of waves  
 a)  **$\alpha$ ,  $\beta$  and  $\gamma$  rays**  
 c)  $\alpha$  and  $\beta$  rays  
 b)  $\alpha$  and  $\gamma$  rays  
 d) None of the above
270. Unit of radioactivity is  
 a) Calorie  
 c) **Curie**  
 b) Joules  
 d) Kilowatt
271. Which part of the human body is the first to be affected by nuclear radiation

- a) Brain
- c) Lungs

- b) Liver
- d) **Bone marrow**

272. Attraction between dispersed phase and dispersion medium is much more in

- a. **Lyophilic Solution**
- c. Both (a) and (b)

- b. Lyophobic solution
- d. None of the above

273. The pH of buffer is determined by  $\text{pH} = \text{pK} + \log[\text{Salt}]/[\text{Acid}]$  which is also known as the equation of

- a) Henderson- Joules
- c) Henderson- Harris

- b) Henderson- Smith
- d) **Henderson- Hasselbalch**

274. The chief buffering system in the blood

- a)  $\text{K}_2\text{HPO}_4$  and  $\text{KH}_2\text{PO}_4$
- c)  **$\text{NaHCO}_3$  and  $\text{H}_2\text{CO}_3$**

- b) Protein and H protein
- d) Haemoglobin and H haemoglobin

275. pH means

- a)  $\log_{10} [\text{H}^+]$
- c)  $\log_{10} [\text{OH}^-]$

- b)-  **$\log_{10} [\text{H}^+]$**
- d)  $\log_{10} [1/\text{H}^+]$

276. The osmotic pressure of a solution increases with the rise in

- a) Cold
- c) Rancidity

- b) Humidity
- d) **Temperature**

277. Thyroid function is determined by the use of the isotope

- a)  $^{24}\text{Na}$
- c)  $^{45}\text{Ca}$

- b)  $^{42}\text{K}$
- d)  $^{131}\text{I}$

278. The viscosity of a liquid increases due to the presence of

- a) **Suspended particles**
- c) Big size particles

- b) Soluble particles
- d) Small size particles

279. Emulsoid are precipitated by

- a) Adding excess amount of acid
- c) **Adding excess amount of salt**

- b) Adding excess amount of alkali
- d) Adding excess amount of

minerals 280. The force with which the surface molecules are held together is called

- a) Osmotic pressure
- c) **Surface tension**

- b) Hydrostatic pressure
- d) None of the above

281. Radiation is used in medicine for

- a) **Destroying cancerous cells**
- c) Destroying germ cells

- b) Destroying healthy cells
- d) Destroying macrophage

282. **Characteristic feature of any form of chromatography is the ...**

- a. use of molecules that are soluble in water.
- b. use of an inert carrier gas.
- c. calculation of an  $R_f$  value for the molecules separated.
- d. **use of a mobile and a stationary phase.**

283. **The basis of the technique of chromatography for separating components of a mixture is ...**

- a. the absorption of infrared radiation by the components.
- b. **the interaction of the components with both stationary and mobile phases.**

- c. the differing movement of particles of different mass in an electric field.  
d. the deflection of charged particles in a magnetic field.
284. What is one property of acids?  
a. Acidic solutions feel slippery. b. Acids taste bitter.  
c. **Acids react with certain metals to generate hydrogen** d. Acids turn red litmus paper blue.
285. The pH of a strong acid will be  
a. **2** b. 9  
c. 4 d. 7
286. Following are the blood buffers except  
a. haemoglobin b. **phosphate**  
c. plasma proteins d. bicarbonate
287. ESR is high in the following conditions except  
a. female b. pregnancy  
c. high altitude d. **infants**
288. Erythropoietin is produced by  
a. loop of Henle b. liver  
c. **peritubular capillaries of renal cortex** d. none of the above
289. Microcytic anemia develops in  
a. VitB<sub>12</sub> deficiency b. folic acid deficiency  
c. **both** d. none of the above.
290. Iron absorption occurs mostly in  
a. **initial half of the small intestine** b. ileum  
c. stomach d. all of the above
291. Lymph in the blood predominantly are  
a. **T-Lymphocytes** b. B-lymphocytes  
c. Both d. Eosinophil
292. Neutrophils are maximally present in  
a. **bone marrow** b. tissue  
c. Tissue fluid d. blood
293. Plasma protein that exert maximum colloidal osmotic pressure is  
a. Prothrombin b. **albumin**  
c. fibrinogen d. globulin
294. Extrinsic system of blood clotting is initiated by  
a. factor -VIII b. **factor -III**  
c. factor-II d. factor-I
295. Haemophilia A is caused by the deficiency of  
a. factor-II b. **factor-X**  
c. factor-VIII d. factor-XII
296. One of the following is not an anticoagulant  
a. heparin b. protein-C  
c. antithrombin-III d. **thrombin**
297. All plasma proteins except one increase ESR  
a. fibrinogen b. **albumin**  
c. globulin d. prothrombin

298. All the indices are increased in macrocytic anemia except
- a. MCV
  - b. PCV
  - c. **MCHC**
  - d. MCH
299. The stage of erythropoiesis at which Hb starts to appear is
- a. reticulocyte
  - b. mature stage
  - c. proerythroblast
  - d. **intermediate normoblast**
300. The normal stored form of iron in liver and spleen is
- a. transferrin
  - b. apoferritin
  - c. **ferritin**
  - d. hemosiderin