1. A drug which prevents uric acid synthesis by inhibiting the enzyme xanthine oxidase is
   (A) Aspirin  (B) Allopurinol
   (C) Colchicine  (D) Probenecid

2. Which of the following is required for crystallization and storage of the hormone insulin?
   (A) Mn ++  (B) Mg ++
   (C) Ca ++  (D) Zn ++

3. Oxidation of which substance in the body yields the most calories
   (A) Glucose  (B) Glycogen
   (C) Protein  (D) Lipids

4. Milk is deficient in which vitamins?
   (A) Vitamin C  (B) Vitamin A
   (C) Vitamin B₂  (D) Vitamin K

5. Milk is deficient of which mineral?
   (A) Phosphorus  (B) Sodium
   (C) Iron  (D) Potassium

6. Synthesis of prostaglandins is inhibited by
   (A) Aspirin  (B) Arsenic
   (C) Fluoride  (D) Cyanide

7. HDL is synthesized and secreted from
   (A) Pancreas  (B) Liver
   (C) Kidney  (D) Muscle

8. Which are the cholesterol esters that enter cells through the receptor-mediated endocytosis of lipoproteins hydrolyzed?
   (A) Endoplasmin reticulum  (B) Lysosomes
   (C) Plasma membrane receptor  (D) Mitochondria

9. Which of the following phospholipids is localized to a greater extent in the outer leaflet of the membrane lipid bilayer?
   (A) Choline phosphoglycerides  (B) Ethanolamine phosphoglycerides
   (C) Inositol phosphoglycerides  (D) Serine phosphoglycerides

10. All the following processes occur rapidly in the membrane lipid bilayer except
    (A) Flexing of fatty acyl chains  (B) Lateral diffusion of phospholipids
        (C) Transbilayer diffusion of phopholipids  (D) Rotation of phospholipids around their long axes

11. Which of the following statement is correct about membrane cholesterol?
    (A) The hydroxyl group is located near the centre of the lipid layer
    (B) Most of the cholesterol is in the form of a cholesterol ester
    (C) The steroid nucleus form forms a rigid, planar structure
12. Which one is the heaviest particulate component of the cell?
(A) Nucleus  (B) Mitochondria  
(C) Cytoplasm  (D) Golgi apparatus

13. Which one is the largest particulate of the cytoplasm?
(A) Lysosomes  (B) Mitochondria  
(C) Golgi apparatus  (D) Endoplasmic reticulum

14. The degradative processes are categorized under the heading of
(A) Anabolism  (B) Catabolism  
(C) Metabolism  (D) None of the above

15. The exchange of material takes place
(A) Only by diffusion  (B) Only by active transport  
(C) Only by pinocytosis  (D) All of these

16. The average pH of Urine is
(A) 7.0  (B) 6.0  
(C) 8.0  (D) 0.0

17. The pH of blood is 7.4 when the ratio between H₂CO₃ and NaHCO₃ is
(A) 1 : 10  (B) 1 : 20  
(C) 1 : 25  (D) 1 : 30

18. The phenomenon of osmosis is opposite to that of
(A) Diffusion  (B) Effusion  
(C) Affusion  (D) Coagulation

19. The surface tension in intestinal lumen between fat droplets and aqueous medium is decreased by
(A) Bile Salts  (B) Bile acids  
(C) Conc. H₂SO₄  (D) Acetic acid

20. Which of the following is located in the mitochondria?
(A) Cytochrome oxidase  
(B) Succinate dehydrogenase  
(C) Dihydrolipoyl dehydrogenase  
(D) All of these

21. The most active site of protein synthesis is the
(A) Nucleus  (B) Ribosome  
(C) Mitochondrion  (D) Cell sap

22. The fatty acids can be transported into and out of mitochondria through
(A) Active transport  (B) Facilitated transfer  
(C) Non-facilitated transfer  (D) None of these

23. Mitochondrial DNA is
(A) Circular double stranded  (B) Circular single stranded  
(C) Linear double helix  (D) None of these

24. The absorption of intact protein from the gut in the foetal and newborn animals takes place by
(A) Pinocytosis  (B) Passive diffusion  
(C) Simple diffusion  (D) Active transport

25. The cellular organelles called “suicide bags” are
(A) Lysosomes  (B) Ribosomes  
(C) Nucleolus  (D) Golgi’s bodies

26. From the biological viewpoint, solutions can be grouped into
(A) Isotonic solution  (B) Hypotonic solutions  
(C) Hypertonic solution  (D) All of these

27. Bulk transport across cell membrane is accomplished by
(A) Phagocytosis  (B) Pinocytosis  
(C) Extrusion  (D) All of these

28. The ability of the cell membrane to act as a selective barrier depends upon
(A) The lipid composition of the membrane  
(B) The pores which allows small molecules  
(C) The special mediated transport systems  
(D) All of these
29. Carrier protein can
(A) Transport only one substance
(B) Transport more than one substance
(C) Exchange one substance to another
(D) Perform all of these functions

30. A lipid bilayer is permeable to
(A) Urea (B) Fructose
(C) Glucose (D) Potassium

31. The Golgi complex
(A) Synthesizes proteins
(B) Produces ATP
(C) Provides a pathway for transporting chemicals
(D) Forms glycoproteins

32. The following points about microfilaments are true except
(A) They form cytoskeleton with microtubules
(B) They provide support and shape
(C) They form intracellular conducting channels
(D) They are involved in muscle cell contraction

33. The following substances are cell inclusions except
(A) Melanin (B) Glycogen
(C) Lipids (D) Centrosome

34. Fatty acids can be transported into and out of cell membrane by
(A) Active transport (B) Facilitated transport
(C) Diffusion (D) Osmosis

35. Enzymes catalyzing electron transport are present mainly in the
(A) Ribosomes
(B) Endoplasmic reticulum
(C) Lysosomes
(D) Inner mitochondrial membrane

36. Mature erythrocytes do not contain
(A) Glycolytic enzymes (B) HMP shunt enzymes
(C) Pyridine nucleotide (D) ATP

37. In mammalian cells rRNA is produced mainly in the
(A) Endoplasmic reticulum
(B) Ribosome
(C) Nucleolus
(D) Nucleus

38. Genetic information of nuclear DNA is transmitted to the site of protein synthesis by
(A) rRNA (B) mRNA
(C) tRNA (D) Polysomes

39. The powerhouse of the cell is
(A) Nucleus (B) Cell membrane
(C) Mitochondria (D) Lysosomes

40. The digestive enzymes of cellular compounds are confined to
(A) Lysosomes (B) Ribosomes
(C) Peroxisomes (D) Polysomes

ANSWERS
82. The percentage of CO₂ carrying capacity of whole blood by hemoglobin and oxyhemoglobin is
   (A) 20  (B) 40
   (C) 60  (D) 80

83. The normal serum CO₂ content is
   (A) 18–20 meq/L  (B) 24–29 meq/L
   (C) 30–34 meq/L  (D) 35–38 meq/L

84. The carbon dioxide carrying power of the blood residing within the red cells is
   (A) 50%  (B) 60%
   (C) 85%  (D) 100%

85. Within the red blood cells the buffering capacity contributed by the phosphates is
   (A) 5%  (B) 10%
   (C) 20%  (D) 25%

86. The normal ratio between the alkaline phosphate and acid phosphate in plasma is
   (A) 2 : 1  (B) 1 : 4
   (C) 20 : 1  (D) 4 : 1

87. The oxygen dissociation curve for hemoglobin is shifted to the right by
   (A) Decreased O₂ tension  (B) Decreased CO₂ tension
   (C) Increased CO₂ tension  (D) Increased pH

88. Bohr effect is
   (A) Shifting of oxyhemoglobin dissociation curve to the right
   (B) Shifting of oxyhemoglobin dissociation curve to the left
   (C) Ability of hemoglobin to combine with O₂
   (D) Exchange of chloride with carbonate

89. Chloride shift is
   (A) H ions leaving the RBC in exchange of Cl⁻
   (B) Cl⁻ leaving the RBC in exchange of bicarbonate
   (C) Bicarbonate ion returns to plasma and exchanged with chloride which shifts into the cell
   (D) Carbonic acid to the plasma

90. Of the total body water, intracellular compartment contains about
   (A) 50%  (B) 60%
   (C) 70%  (D) 80%

91. Osmotically active substances in plasma are
   (A) Sodium  (B) Chloride
   (C) Proteins  (D) All of these

92. Osmotic pressure of plasma is
   (A) 80–100 milliosmole/litre  (B) 180–200 milliosmole/litre
   (C) 280–300 milliosmole/litre  (D) 380–400 milliosmole/litre

93. Contribution of albumin to colloid osmotic pressure of plasma is about
   (A) 10%  (B) 50%
   (C) 80%  (D) 90%

94. The highest concentration of proteins is present in
   (A) Plasma  (B) Interstitial fluid
   (C) Interstitial fluid  (D) Transcellular fluid

95. Oncotic pressure of plasma is due to
   (A) Proteins  (B) Chloride
   (C) Sodium  (D) All of these

96. Oncotic pressure of plasma is about
   (A) 10 mm of Hg  (B) 15 mm of Hg
   (C) 25 mm of Hg  (D) 50 mm of Hg

97. Oedema can occur when
   (A) Plasma Na and Cl are decreased
   (B) Plasma Na and Cl are increased
   (C) Plasma proteins are decreased
   (D) Plasma proteins are increased

98. Colloid osmotic pressure of intracellular fluid is
   (A) Equal to that of plasma  (B) More than that of plasma
   (C) More than that of plasma  (D) Nearly zero
99. The water produced during metabolic reactions in an adult is about
   (A) 100 ml/day    (B) 300 ml/day
   (C) 500 ml/day    (D) 700 ml/day

100. The daily water loss through gastrointestinal tract in an adult is about
   (A) Less than 100 ml/day
   (B) 200 ml/day
   (C) 300 ml/day
   (D) 400 ml/day

101. Recurrent vomiting leads to loss of
   (A) Potassium      (B) Chloride
   (C) Bicarbonate    (D) All of these

102. Obligatory reabsorption of water
   (A) Is about 50% of the total tubular reabsorption of water
   (B) Is increased by antidiuretic hormone
   (C) Occurs in distal convoluted tubules
   (D) Is secondary to reabsorption of solutes

103. Antidiuretic hormone
   (A) Is secreted by hypothalamus
   (B) Secretion is increased when osmolality of plasma decreases
   (C) Increases obligatory reabsorption of water
   (D) Acts on distal convoluted tubules and collecting ducts

104. Urinary water loss is increased in
   (A) Diabetes mellitus
   (B) Diabetes insipidus
   (C) Chronic glomerulonephritis
   (D) All of these

105. Diabetes insipidus results from
   (A) Decreased insulin secretion
   (B) Decreased ADH secretion
   (C) Decreased aldosterone secretion
   (D) Unresponsiveness of osmoreceptors

106. Thiazide diuretics inhibit
   (A) Carbonic anhydrase
   (B) Aldosterone secretion
   (C) ADH secretion
   (D) Sodium reabsorption in distal tubules

107. Furosemide inhibits reabsorption of sodium and chloride in
   (A) Proximal convoluted tubules
   (B) Loop of Henle
   (C) Distal convoluted tubules
   (D) Collecting ducts

108. A diuretic which is an aldosterone antagonist is
   (A) Spironolactone
   (B) Ethacrynic acid
   (C) Acetazolamide
   (D) Chlorothiazide

109. In a solution having a pH of 7.4, the hydrogen ion concentration is
   (A) 7.4 nmol/L
   (B) 40 nmol/L
   (C) 56 nmol/L
   (D) 80 nmol/L

110. At pH 7.4, the ratio of bicarbonate : dissolved CO₂ is
   (A) 1 : 1
   (B) 10 : 1
   (C) 20 : 1
   (D) 40 : 1

111. Quantitatively, the most significant buffer system in plasma is
   (A) Phosphate buffer system
   (B) Carbonic acid-bicarbonate buffer system
   (C) Lactic acid-lactate buffer system
   (D) Protein buffer system

112. In a solution containing phosphate buffer, the pH will be 7.4, if the ratio of monohydrogen phosphate : dihydrogen phosphate is
   (A) 4 : 1
   (B) 5 : 1
   (C) 10 : 1
   (D) 20 : 1

113. pKₐ of dihydrogen phosphate is
   (A) 5.8
   (B) 6.1
   (C) 6.8
   (D) 7.1

114. Buffering action of haemoglobin is mainly due to its
   (A) Glutamine residues
   (B) Arginine residues
   (C) Histidine residues
   (D) Lysine residues
115. Respiratory acidosis results from
(A) Retention of carbon dioxide
(B) Excessive elimination of carbon dioxide
(C) Retention of bicarbonate
(D) Excessive elimination of bicarbonate

116. Respiratory acidosis can occur in all of the following except
(A) Pulmonary oedema
(B) Hysterical hyperventilation
(C) Pneumothorax
(D) Emphysema

117. The initial event in respiratory acidosis is
(A) Decrease in pH
(B) Increase in pCO₂
(C) Increase in plasma bicarbonate
(D) Decrease in plasma bicarbonate

118. Respiratory alkalosis can occur in
(A) Bronchial asthma
(B) Collapse of lungs
(C) Hysterical hyperventilation
(D) Bronchial obstruction

119. The primary event in respiratory alkalosis is
(A) Rise in pH
(B) Decrease in pCO₂
(C) Increase in plasma bicarbonate
(D) Decrease in plasma chloride

120. Anion gap is the difference in the plasma concentrations of
(A) (Chloride) – (Bicarbonate)
(B) (Sodium) – (Chloride)
(C) (Sodium + Potassium) – (Chloride + Bicarbonate)
(D) (Sum of cations) – (Sum of anions)

121. Normal anion gap in plasma is about
(A) 5 meq/L      (B) 15 meq/L
(C) 25 meq/L     (D) 40 meq/L

122. Anion gap is normal in
(A) Hyperchloraeic metabolic acidosis
(B) Diabetic ketoacidosis
(C) Lactic acidosis
(D) Uraemic acidosis

123. Anion gap is increased in
(A) Renal tubular acidosis
(B) Metabolic acidosis resulting from diarrhoea
(C) Metabolic acidosis resulting from intestinal obstruction
(D) Diabetic ketoacidosis

124. Anion gap in plasma is because
(A) Of differential distribution of ions across cell membranes
(B) Cations outnumber anions in plasma
(C) Anions outnumber cations in plasma
(D) Of unmeasured anions in plasma

125. Salicylate poisoning can cause
(A) Respiratory acidosis
(B) Metabolic acidosis with normal anion gap
(C) Metabolic acidosis with increased anion gap
(D) Metabolic alkalosis

126. Anion gap of plasma can be due to the presence of all the following except
(A) Bicarbonate
(B) Lactate
(C) Pyruvate
(D) Citrate

127. All the following features are found in blood chemistry in uncompensated lactic acidosis except
(A) pH is decreased
(B) Bicarbonate is decreased
(C) pCO₂ is normal
(D) Anion gap is normal

128. All the following statements about renal tubular acidosis are correct except
(A) Renal tubules may be unable to reabsorb bicarbonate
(B) Renal tubules may be unable to secrete hydrogen ions
(C) Plasma chloride is elevated
(D) Anion gap is decreased

129. All the following changes in blood chemistry can occur in severe diarrhoea except
(A) Decreased pH
(B) Decreased bicarbonate
(C) Increased pCO₂
(D) Increased chloride
130. During compensation of respiratory alkalosis, all the following changes occur except
   (A) Decreased secretion of hydrogen ions by renal tubules
   (B) Increased excretion of sodium in urine
   (C) Increased excretion of bicarbonate in urine
   (D) Increased excretion of ammonia in urine

131. Blood chemistry shows the following changes in compensated respiratory acidosis:
   (A) Increased pCO₂
   (B) Increased bicarbonate
   (C) Decreased chloride
   (D) All of these

132. Metabolic alkalosis can occur in
   (A) Severe diarrhoea
   (B) Renal failure
   (C) Recurrent vomiting
   (D) Excessive use of carbonic anhydrase inhibitors

133. Which of the following features are present in blood chemistry in uncompensated metabolic alkalosis except?
   (A) Increased pH
   (B) Increased bicarbonate
   (C) Normal chloride
   (D) Normal pCO₂

134. One joule is the energy required to
   (A) Raise the temperature of 1 gm of water by 1°C
   (B) Move a mass of 1 kg by 1 m distance by a force of 1 Newton
   (C) Raise the temperature of 1 gm by 1 cm distance by a force of 1 Newton
   (D) Move a mass of 1 kg by 1 m distance by a force of 1 Newton

135. Organic compound of small molecular size is
   (A) Urea  (B) Uric acid
   (C) Creatinine  (D) Phosphates

136. Organic substance of large molecular size is
   (A) Starch  (B) Insulin
   (C) Lipids  (D) Proteins

137. Body water is regulated by the hormone:
   (A) Oxytocin  (B) ACTH
   (C) FSH  (D) Epinephrine

138. Calcium is required for the activation of the enzyme:
   (A) Isocitrate dehydrogenase  (B) Fumarase
   (C) Succinate thiokinase  (D) ATPase

139. Cobalt is a constituent of
   (A) Folic acid  (B) Vitamin B₁₂
   (C) Niacin  (D) Biotin

140. Calcium absorption is inferred by
   (A) Fatty acids  (B) Amino acids
   (C) Vitamin D  (D) Vitamin B₁₂

141. The average of pH of urine is
   (A) 5.6  (B) 6.0
   (C) 6.4  (D) 7.0
## ANSWERS

139. B  140. A  141. B