

46. Which of the following in sewage treatment removes suspended solids?  
(1) Tertiary treatment (2) Secondary treatment (3) Primary treatment (4) Sludge treatment
47. Which one of the following is related to Ex-situ conservation of threatened animals and plants?  
(1) Wildlife Safari parks (2) Biodiversity hot spots  
(3) Amazon rainforest (4) Himalayan region
48. Phosphoenol pyruvate (PEP) is the primary  $\text{CO}_2$  acceptor in:  
(1)  $\text{C}_3$  plants (2)  $\text{C}_4$  plants (3)  $\text{C}_2$  plants (4)  $\text{C}_3$  and  $\text{C}_4$  plants
49. Which one of the following statements is not valid for aerosols?  
(1) They are harmful to human health  
(2) They alter rainfall and monsoon patterns  
(3) They cause increased agricultural productivity  
(4) They have negative impact on agricultural land
50. In case of poriferans, the spongocoel is lined with flagellated cells called:  
(1) ostia (2) oscula (3) choanocytes (4) mesenchymal cells
51. Which cells of 'Crypts of Lieberkuhn' secrete antibacterial lysozyme?  
(1) Argentaffin cells (2) Paneth cells (3) Zymogen cells (4) Kupffer cells
52. Lungs are made up of air-filled sacs, the alveoli. They do not collapse even after forceful expiration, because of:  
(1) Residual Volume (2) Inspiratory Reserve Volume  
(3) Tidal Volume (4) Expiratory Reserve Volume
53. Viroids differ from viruses in having:  
(1) DNA molecules with protein coat (2) DNA molecules without protein coat  
(3) RNA molecules with protein coat (4) RNA molecules without protein coat
54. Which of the following are not polymeric?  
(1) Nucleic acids (2) Proteins (3) Polysaccharides (4) Lipids
55. Select the mismatch:  
(1) *Pinus* - Dioecious  
(2) *Cycas* - Dioecious  
(3) *Salvinia* - Heterosporous  
(4) *Equistum* - Homosporous
56. A gene whose expression helps to identify transformed cell is known as:  
(1) Selectable marker (2) Vector (3) Plasmid (4) Structural gene
57. A decrease in blood pressure/volume will not cause the release of:  
(1) Renin (2) Atrial Natriuretic Factor  
(3) Aldosterone (4) ADH

58. In Bougainvillea thorns are the modifications of:  
 (1) Stipules (2) Adventitious root (3) Stem (4) Leaf
59. An important characteristic that Hemichordates share with Chordates is:  
 (1) absence of notochord (2) ventral tubular nerve cord  
 (3) pharynx with gill slits (4) pharynx without gill slits
60. Which of the following facilitates opening of stomatal aperture?  
 (1) Contraction of outer wall of guard cells  
 (2) Decrease in turgidity of guard cells  
 (3) Radial orientation of cellulose microfibrils in the cell wall of guard cells  
 (4) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells
61. Which of the following statements is CORRECT?  
 (1) The ascending limb of loop of Henle is impermeable to water.  
 (2) The descending limb of loop of Henle is impermeable to water.  
 (3) The ascending limb of loop of Henle is permeable to water.  
 (4) The descending limb of loop of Henle is permeable to electrolytes.
62. Which of the following are found in extreme saline conditions?  
 (1) Archaeobacteria (2) Eubacteria (3) Cyanobacteria (4) Mycobacteria
63. The morphological nature of the edible part of coconut is:  
 (1) Perisperm (2) Cotyledon (3) Endosperm (4) Pericarp
64. Identify the WRONG statement in context of heartwood:  
 (1) Organic compounds are deposited in it  
 (2) It is highly durable  
 (3) It conducts water and minerals efficiently  
 (4) It comprises dead elements with highly lignified walls
65. If there are 999 bases in an RNA that codes for a protein with 333 amino acids, and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered?  
 (1) 1 (2) 11 (3) 33 (4) 333
66. The region of Biosphere Reserve which is legally protected and where no human activity is allowed is known as:  
 (1) Core zone (2) Buffer zone (3) Transition zone (4) Restoration zone
67. A dioecious flowering plant prevents both:  
 (1) Autogamy and xenogamy (2) Autogamy and geitonogamy  
 (3) Geitonogamy and xenogamy (4) Cleistogamy and xenogamy
68. Which statement is WRONG for Krebs' cycle?  
 (1) There are three points in the cycle where  $\text{NAD}^+$  is reduced to  $\text{NADH} + \text{H}^+$   
 (2) There is one point in the cycle where  $\text{FAD}^+$  is reduced to  $\text{FADH}_2$   
 (3) During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesised  
 (4) The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid
69. Which among these is the CORRECT combination of aquatic mammals?  
 (1) Seals, Dolphins, Sharks (2) Dolphins, Seals, *Trygon*  
 (3) Whales, Dolphins, Seals (4) *Trygon*, Whales, Seals

70. The hepatic portal vein drains blood to liver from:  
 (1) Heart (2) Stomach (3) Kidneys (4) Intestine
71. Functional megaspore in an angiosperm develops into.  
 (1) Ovule (2) Endosperm (3) Embryo sac (4) Embryo
72. Mycorrhizae are the example of:  
 (1) Fungistasis (2) Amensalism (3) Antibiosis (4) Mutualism
73. Transplantation of tissues/organs fails often due to non-acceptance by the patient's body. Which type of immune-response is responsible for such rejections?  
 (1) Autoimmune response (2) Cell-mediated immune response  
 (3) Hormonal immune response (4) Physiological immune response
74. Adult human RBCs are enucleate. Which of the following statements(s) is/are most appropriate explanation for this feature?  
 (a) They do not need to reproduce  
 (b) They are somatic cells  
 (c) They do not metabolize  
 (d) All their internal space is available for oxygen transport  
 (1) Only (d) (2) Only (a) (3) (a), (c) and (d) (4) (b) and (c)
75. Alexander Von Humbolt described for the first time:  
 (1) Ecological Biodiversity (2) Laws of limiting factor  
 (3) Species area relationships (4) Population Growth equation
76. Attractants and rewards are required for:  
 (1) Anemophily (2) Entomophily (3) Hydrophily (4) Cleistogamy
77. Which one of the following statements is CORRECT with reference to enzymes?  
 (1) Apoenzyme = Holoenzyme + Coenzyme (2) Holoenzyme = Apoenzyme + Coenzyme  
 (3) Coenzyme = Apoenzyme + Holoenzyme (4) Holoenzyme = Coenzyme + Co-factor
78. An example of colonial alga is:  
 (1) Chlorella (2) Volvox (3) Ulothrix (4) Spirogyra
79. A disease caused by an autosomal primary non-disjunction is:  
 (1) Down's Syndrome (2) Klinefelter's Syndrome  
 (3) Turner's Syndrome (4) Sickle Cell Anemia
80. DNA fragments are:  
 (1) Positively charged  
 (2) Negatively charged  
 (3) Neutral  
 (4) Either positively or negatively charged depending their size
81. The pivot joint between atlas and axis is a type of:  
 (1) fibrous joint (2) cartilaginous joint (3) synovial joint (4) saddle joint
82. Asymptote in a logistic growth curve is obtained when:  
 (1) The value of 'r' approaches zero (2)  $K = N$   
 (3)  $K > N$  (4)  $K < N$

83. Myelin sheath is produced by:  
 (1) Schwann Cells and Oligodendrocytes (2) Astrocytes and Schwann Cells  
 (3) Oligodendrocytes and Osteoclasts (4) Osteoclasts and Astrocytes
84. The process of separation and purification of expressed protein before marketing is called:  
 (1) Upstream processing (2) Downstream processing  
 (3) Bioprocessing (4) Postproduction processing
85. GnRH, a hypothalamic hormone, needed in reproduction, acts on:  
 (1) anterior pituitary gland and stimulates secretion of LH and oxytocin.  
 (2) anterior pituitary gland and stimulates secretion of LH and FSH.  
 (3) posterior pituitary gland and stimulates secretion of oxytocin and FSH.  
 (4) posterior pituitary gland and stimulates secretion of LH and relaxin.
86. Hypersecretion of Growth Hormone in adults does not cause further increase in height, because  
 (1) Growth Hormone becomes inactive in adults.  
 (2) Epiphyseal plates close after adolescence.  
 (3) Bones lose their sensitivity of Growth Hormone in adults.  
 (4) Muscle fibres do not grow in size after birth
87. Which ecosystem has the maximum biomass?  
 (1) Forest ecosystem (2) Grassland ecosystem (3) Pond ecosystem (4) Lake ecosystem
88. Fruit and leaf drop at early stages can be prevented by the application of:  
 (1) Cytokinins (2) Ethylene (3) Auxins (4) Gibberellic acid
89. The final proof for DNA as the genetic material came from the experiments of:  
 (1) Griffith (2) Hershey and Chase  
 (3) Avery, Mcleod and McCarty (4) Hargobind Khorana
90. Which of the following represents order of 'Horse'?  
 (1) Equidae (2) Perissodactyla (3) Caballus (4) Ferus
91. Out of 'X' pairs of ribs in humans only 'Y' pairs are true ribs, Select the option that CORRECTLY represents values of X and Y and provides their explanation:  
 (1) X = 12, Y = 7 True ribs are attached dorsally to vertebral column and ventrally to the sternum.  
 (2) X = 12, Y = 5 True ribs are attached dorsally to vertebral column and sternum on the two ends.  
 (3) X = 24, Y = 12 True ribs are dorsally attached to vertebral column but are free on ventral side.  
 (4) X = 24, Y = 12 True ribs are dorsally attached to vertebral column but are free on ventral side.
92. Match the following sexually transmitted diseases (Column-I) with their causative agent (Column-II) and select the CORRECT option.
- | Column – I        |            | Column – II                |            |
|-------------------|------------|----------------------------|------------|
| (a) Gonorrhoea    |            | (i) HIV                    |            |
| (b) Syphilis      |            | (ii) <i>Neisseria</i>      |            |
| (c) Genital Warts |            | (iii) <i>Treponema</i>     |            |
| (d) AIDS          |            | (iv) Human Papilloma-Virus |            |
| <b>(a)</b>        | <b>(b)</b> | <b>(c)</b>                 | <b>(d)</b> |
| (1) (ii)          | (iii)      | (iv)                       | (i)        |
| (2) (iii)         | (iv)       | (i)                        | (ii)       |

- (3) (iv) (ii) (iii) (i)  
 (4) (iv) (iii) (ii) (i)

93. Thalassaemia and sickle cell anemia are caused due to a problem in globin molecules synthesis. Select the CORRECT statement.  
 (1) Both are due to a qualitative defect in globin chain synthesis.  
 (2) Both are due to a quantitative defect in globin chain synthesis.  
 (3) Thalassaemia is due to less synthesis of globin molecules.  
 (4) Sickle cell anemia is due to a quantitative problem of globin molecules
94. Which of the following is made up of dead cells?  
 (1) Xylem parenchyma (2) Collenchyma  
 (3) Phellem (4) Phloem
95. A baby boy aged two years is admitted to play school and passes through a dental check-up. The dentist observed that the boy had twenty teeth. Which teeth were absent?  
 (1) Incisors (2) Canines (3) Pre-molars (4) Molars
96. Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP?  
 (1) Lysosome (2) Ribosome (3) Chloroplast (4) Mitochondrion
97. Capacitation occurs in:  
 (1) Rete testis (2) Epididymis  
 (3) Vas deferens (4) Female Reproductive tract
98. The association of histone H1 with a nucleosome indicates  
 (1) Transcription is occurring  
 (2) DNA replication is occurring  
 (3) The DNA is condensed into a Chromatin fibre.  
 (4) The DNA double helix is exposed
99. With reference to factors affecting the rate of photosynthesis, which of the following statements is not CORRECT?  
 (1) Light saturation for  $\text{CO}_2$  fixation occurs at 10% of full sunlight  
 (2) Increasing atmospheric  $\text{CO}_2$  concentration up to 0.05% can enhance  $\text{CO}_2$  fixation rate  
 (3)  $\text{C}_3$  plants respond to higher temperatures with enhanced photosynthesis while  $\text{C}_4$  plants have much lower temperature optimum  
 (4) Tomato is a greenhouse crop which can be grown in  $\text{CO}_2$ -enriched atmosphere for higher yield
100. Homozygous purelines in cattle can be obtained by:  
 (1) mating of related individuals of same breed.  
 (2) mating of unrelated individuals of same breed.  
 (3) mating of individuals of different breed.  
 (4) mating of individuals of different species.
101. Which of the following options gives the CORRECT sequence of events during mitosis?  
 (1) condensation → nuclear membrane disassembly → crossing over → segregation → telophase  
 (2) condensation → nuclear membrane disassembly → arrangement at equator → centromere division → segregation → telophase  
 (3) condensation → crossing over → nuclear membrane disassembly → segregation → telophase  
 (4) condensation → arrangement equator → centromere division → segregation → telophase

102. Select the CORRECT route for the passage of sperms in male frogs:  
 (1) Testes → Bidder's canal → Kidney → Vasa efferentia → Urinogenital duct → Cloaca  
 (2) Testes → Vasa efferentia → Kidney → Seminal Vesicle → Urinogenital duct → Cloaca  
 (3) Testes → Vasa efferentia → Bidder's canal → Urinogenital duct → Cloaca  
 (4) Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca
103. Spliceosomes are not found in cells of:  
 (1) Plants (2) Fungi (3) Animals (4) Bacteria
104. Which one from those given below is the period for Mendel's hybridization experiments?  
 (1) 1856-1863 (2) 1840-1850 (3) 1857-1869 (4) 1870-1877
105. The DNA fragments separated on an agarose gel can be visualized after staining with:  
 (1) Bromophenol blue (2) Acetocarmine (3) Aniline blue (4) Ethidium bromide
106. The function of copper ions in copper releasing IUD's is:  
 (1) They suppress sperms motility and fertilizing capacity of sperms.  
 (2) They inhibit gametogenesis.  
 (3) They make uterus unsuitable for implantation  
 (4) They inhibit ovulation.
107. Presence of plants arranged into well defined vertical layers depending on their height can be seen best in:  
 (1) Tropical Savannah (2) Tropical Rain Forest  
 (3) Grassland (4) Temperate Forest
108. Which of the following CORRECTLY matched for the product produced by them?  
 (1) *Acetobacter aceti* : Antibiotics (2) *Methanobacterium* : Lactic acid  
 (3) *Penicillium notatum* : Acetic acid (4) *Sacchromyces cerevisiae* : Ethanol
109. What is the criterion for DNA fragments movement on agarose gel during gel electrophoresis?  
 (1) The larger the fragment size, the farther it moves  
 (2) The smaller the fragment size, the farther it moves  
 (3) Positively charged fragments move to farther end  
 (4) Negatively charged fragments do not move
110. Zygotic meiosis is characteristic of:  
 (1) *Marchantia* (2) *Fucus* (3) *Funaria* (4) *Chlamydomonas*
111. Life cycle of Ectocarpus and Fucus respectively are:  
 (1) Haplontic, Diplontic (2) Diplontic, Haplodiplontic  
 (3) Haplodiplontic, Diplontic (4) Haplodiplontic, Haplontic
112. Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen?  
 (1) *Bacillus* (2) *Pseudomonas* (3) Mycoplasma (4) *Nostoc*
113. Root hairs develop from the region of:  
 (1) Maturation (2) Elongation (3) Root cap (4) Meristematic activity
114. Flowers which have single ovule in the ovary and are packed into inflorescence are usually pollinated by:  
 (1) Water (2) Bee (3) Wind (4) Bat

115. Receptor sites for neurotransmitters are present on:  
 (1) membranes of synaptic vesicles (2) pre-synaptic membrane  
 (3) tips of axons (4) post-synaptic membrane
116. Plants which produce characteristic pneumatophores and show vivipary belong to:  
 (1) Mesophytes (2) Halophytes (3) Psammophytes (4) Hydrophytes
117. DNA replication in bacterial occurs:  
 (1) During S phase (2) Within nucleolus  
 (3) Prior to fission (4) Just before transcription
118. The genotypes of a Husband and Wife are  $I^A I^B$  and  $I^A i$ .  
 Among the blood types of their children, how many different genotypes and phenotypes are possible?  
 (1) 3 genotypes; 3 phenotypes (2) 3 genotypes; 4 phenotypes  
 (3) 4 genotypes; 3 phenotypes (4) 4 genotypes; 4 phenotypes
119. Which of the following compounds provides sticky character to the bacterial cell?  
 (1) Cell wall (2) Nuclear membrane (3) Plasma membrane (4) Glycocalyx
120. Which of the following RNAs should be most abundant in animal cell?  
 (1) r-RNA (2) t-RNA (3) m-RNA (4) mi-RNA
121. Anaphase Promoting Complex (APC) is a protein degradation machinery necessary for proper mitosis of animal cells. If APC is defective in a human cell, which of the following is expected to occur?  
 (1) Chromosomes will not condense  
 (2) Chromosomes will be fragmented  
 (3) Chromosomes will not segregate\*\*  
 (4) Recombination of chromosome arms will occurs
122. Among the following characters, which one was not considered by Mendel in his experiments on pea?  
 (1) Stem-Tall or Dwarf (2) Trichomes- Glandular or non-glandular  
 (3) Seed-Green or Yellow (4) Pod-Inflated or Constricted
123. Select the mismatch:  
 (1) *Frankia* - *Alnus*  
 (2) *Rhodospirillum* - Mycorrhiza  
 (3) *Anabaena* - Nitrogen fixer  
 (4) *Rhizobium* - Alfalfa
124. Double fertilization is exhibited by:  
 (1) Gymnosperms (2) Algae (3) Fungi (4) Angiosperms
125. In case of a couple where the male is having a very low sperm count, which technique will be suitable for fertilization?  
 (1) Intrauterine transfer (2) Gamete intracytoplasmic fallopian transfer  
 (3) Artificial Insemination (4) Intracytoplasmic sperm injection
126. A temporary endocrine gland in the human body is:  
 (1) Pineal gland (2) Corpus cardiacum (3) Corpus luteum (4) Corpus allatum

127. The vascular cambium normally gives rise to:  
 (1) Phelloderm (2) Primary phloem (3) Secondary xylem (4) Periderm
128. During DNA replication, Okazaki fragments are used to elongate:  
 (1) The leading strand towards replication fork.  
 (2) The lagging strand towards replication fork.  
 (3) The leading strand away from replication fork.  
 (4) The lagging strand away from the replication fork.
129. Artificial selection to obtain cows yielding higher milk output represents:  
 (1) stabilizing selection as it stabilizes this character in the population.  
 (2) directional as it pushes the mean of the character in one direction  
 (3) disruptive as it splits the population into two, one yielding higher output and the other lower output  
 (4) stabilizing followed by disruptive as it stabilized the population to produce higher yielding cows.
130. Which of the following option best represented the enzyme composition of pancreatic juice?  
 (1) amylase, peptidase, trypsinogen, rennin  
 (2) amylase, pepsin, trypsinogen, maltase  
 (3) peptidase, amylase, pepsin, rennin  
 (4) lipase, amylase, trypsinogen , procarboxypeptidase
131. Coconut fruit is a:  
 (1) Drupe (2) Berry (3) Nut (4) Capsule
132. The water potential of pure water is:  
 (1) Zero (2) Less than zero  
 (3) More than zero but less than one (4) More than one
133. Frog's heart when taken out of the body continues to beat for sometime.  
 Select the best option from the following statements.  
 (a) Frog is a poikilotherm. (b) Frog does not have any coronary circulation.  
 (c) Heart is "myogenic" in nature (d) Heart is Autoexcitable.  
 Options:  
 (1) Only (c) (2) Only (d) (3) (a) and (b) (4) (c) and (d)
134. Good vision depends on adequate intake of carotene rich food.  
 Select the best option from the following statements.  
 (a) Vitamin A derivatives are formed from carotene.  
 (b) The photo pigments are embedded in the membrane discs of the inner segment.  
 (c) Retinal is a derivative of Vitamin A.  
 (d) Retinal is a light absorbing part of all the visual photo pigments.  
 Opitons:  
 (1) (a) and (b) (2) (a), (c) and (d) (3) (a) and (c) (4) (b), (c) and (d)
135. MALT constitutes about \_\_\_\_\_ percent of the lymphoid tissue in human body.  
 (1) 50% (2) 20% (3) 70% (4) 10%