

BIOLOGY

- 51.** The bacterium *Bacillus thuringiensis* is widely used in contemporary biology as
- (1) Indicator of water pollution (2) Insecticide
(3) Agent for production of dairy products (4) Source of industrial enzyme
- Sol. (2)**
- 52.** Chipko movement was launched for the protection of
- (1) Grasslands (2) Forests (3) Livestock (4) Wet lands
- Sol. (2)**
- 53.** A health disorder that results from the deficiency of thyroxine in adults and characterized by (i) a low metabolic rate, (ii) increase in body weight and (iii) tendency to retain water in tissues is
- (1) Hypothyroidism (2) Simple goitre (3) Myxoedema (4) Cretinism
- Sol. (3)**
- 54.** Elbow joint is an example of
- (1) Pivot joint (2) Hinge joint (3) Gliding joint (4) Ball and socket joint
- Sol. (2)**
- 55.** The correct sequence of plants in a hydrosere is
- (1) Oak – Lantana – Scirpus – Pistia – hydrilla - Volvox (2) Volvox – Hydrilla – Pistia – Scirpus – Lantana - oak
(3) Pistia – Volvox – Scirpus – hydrilla – Oak – Lantana (4) Oak – Lantana – Volvox – Hydrilla – Pistia - Scirpus
- Sol. (2)**
- 56.** Mannitol is the stored food in
- (1) Chara (2) Porphyra (3) Fucus (4) Gracillaria
- Sol. (3)**
- 57.** The epithelial tissue present on the inner surface of bronchioles and fallopian tubes is
- (1) Cuboidal (2) Glandular (3) Ciliated (4) Squamous
- Sol. (3)**
- 58.** Which one of the following pairs of food components in humans reaches the stomach totally undigested
- (1) Protein and starch (2) Fat and starch (3) Fat and cellulose (4) Starch and cellulose
- Sol. (3)**
- 59.** Uric acid is the chief nitrogenous component of the excretory products of
- (1) Man (2) Earthworm (3) Cockroach (4) Frog
- Sol. (3)**
- 60.** Which one of the following groups of animals is bilaterally symmetrical and triploblastic
- (1) Coelenterates (Cnidarians) (2) Aschelminthes (round worms)
(3) Ctenophores (4) Sponges
- Sol. (2)**
- 61.** Tiger is not a resident in which one of the following national park
- (1) Ranthamhbor (2) Sunderbans (3) Gir (4) Jim Corbett
- Sol. (3)**

62. A change in the amount of yolk and its distribution in the egg will affect

- (1) Formation of zygote (2) Pattern of cleavage
(3) Number of blastomeres produced (4) Fertilization

Sol. (2)

63. When breast feeding is replaced by less nutritive food low in proteins and calories; the infants below the age of one year are likely to suffer from

- (1) Marasmus (2) Rickets (3) Kwashiorkor (4) Pellagra

Sol. (1)

64. Stroma in the chloroplasts of higher plant contains

- (1) Light-independent reaction enzymes (2) Light-dependent reaction enzymes
(3) Ribosomes (4) Chlorophyll

Sol. (1)

65. Which one of the following correctly describes the location of some body parts in the earthworm Pheretima

- (1) Two pairs of accessory glands in 16-18 segments
(2) Four pairs of spermathecae in 4 – 7 segments
(3) One pair of ovaries attached at intersegmental septum of 14th and 15th segments
(4) Two pairs of testes in 10th and 11th segments

Sol. (4)

66. Foetal ejection reflex in human female is induced by

- (1) Pressure exerted by amniotic fluid (2) Release of oxytocin from pituitary
(3) Fully developed foetus and placenta (4) Differentiation of mammary glands

Sol. (3)

67. Which one of the following has haplontic life cycle

- (1) Funaria (2) Polytrichum (3) Ustilago (4) Wheat

Sol. (3)

68. Which of the following plant species you would select for the production of bioethanol

- (1) Brassica (2) Zea mays (3) Pongamia (4) Jatropha

Sol. (4)

69. Which part of human brain is concerned with the regulation of body temperature

- (1) Medulla Oblongata (2) Cerebellum (3) Cerebrum (4) Hypothalamus

Sol. (4)

70. Which one of the following is correct pairing of a body part and the kind of muscle tissue that moves it

- (1) Heart wall – involuntary unstriated muscle (2) Biceps of upper arm – Smooth muscle fibres upper arm
(3) Abdominal wall – Smooth muscle (4) Iris – Involuntary smooth muscle

Sol. (4)

71. In the case of peppered moth (*Biston betularia*) the black-coloured form became dominant over the light-coloured form in England during industrial revolution. This is an example of

- (1) Natural selection whereby the darker forms were selected
(2) Appearance of the darker coloured individuals due of very poor sunlight
(3) Protective mimicry
(4) Inheritance of darker colour character acquired due to the darker environment

Sol. (1)

72. Oxygenic photosynthesis occurs in
 (1) Chromatium (2) Oscillatoria (3) Rhodospirillum (4) Chlorobium

Sol. (2)

73. The genetic defect-adenosine deaminase (ADA) deficiency may be cured permanently by
 (1) Periodic infusion of genetically engineered lymphocytes having functional ADA cDNA
 (2) Administering adenosine deaminase activators
 (3) Introducing bone marrow cells producing ADA into cells at early embryonic stages
 (4) Enzyme replacement therapy

Sol. (3)

74. The annular and spirally thickened conducting elements generally develop in the protoxylem when the root or stem is
 (1) Maturing (2) Elongating (3) Widening (4) Differentiating

Sol. (1)

75. In barley stem vascular bundles are
 (1) Open and scattered (2) Closed and scattered (3) Open and in a ring (4) Closed and radial

Sol. (2)

76. Sickle cell anemia is
 (1) An autosomal linked dominant trait
 (2) Caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin
 (3) Caused by a change in a single base pair of DNA
 (4) Characterized by elongated sickle like RBCs with a nucleus

Sol. (3)

77. If a live earthworm is pricked with a needle on its outer surface damaging its gut, the fluid that comes out is
 (1) Excretory fluid (2) Coelomic fluid (3) Haemolymph (4) Slimy mucus

Sol. (2)

78. There is on DNA in
 (1) An enucleated ovum (2) Mature RBCs (3) A mature spermatozoan (4) Hair root

Sol. (2)

79. Point mutation involves
 (1) Insertion (2) Change in single base pair (3) Duplication (4) Deletion

Sol. (2)

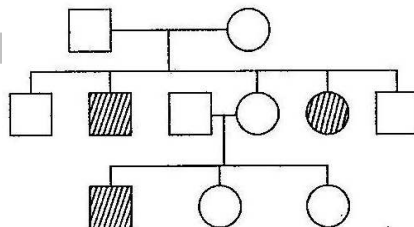
80. Which one of the following has maximum genetic diversity in India
 (1) Teak (2) Mango (3) Wheat (4) Tea

Sol. (2)

81. In a standard ECG which one of the following alphabets is the correct representation of the respective of the human heart
 (1) R – repolarisation of ventricles (2) S – start of systole
 (3) T – end of diastole (4) P – depolarization of the atria

Sol. (4)

82. Study the pedigree chart given below



What does it show

- (1) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria
- (2) Inheritance of a condition like phenylketonuria as an autosomal recessive trait
- (3) The pedigree chart is wrong as this is not possible
- (4) Inheritance of a recessive sex-linked disease like haemophilia

Sol. (2)

83. Middle lamella is composed mainly of

- (1) Hemicellulose (2) Muramic acid (3) Calcium Pectate (4) Phosphoglycerides

Sol. (3)

84. Somaclones are obtained by

- (1) Tissue culture (2) Plant breeding (3) Irradiation (4) Genetic engineering

Sol. (1)

85. Which one of the following plants is monoecious

- (1) Marchantia (2) Pinus (3) Cycas (4) Papaya

Sol. (2)

86. Which one of the following is the correct matching of three items and their grouping category

- | Items | Group |
|--|--|
| (1) Malleus, incus, cochlea - Ear ossicles | (2) Ilium, ischium, pubis - Coxal bones of pelvic girdle |
| (3) Actin, myosin, rhodopsin - Muscle proteins | (4) Cytosine, uracil, thiamine - Pyrimidines |

Sol. (2)

87. Plasmodesmata are

- (1) Lignified cemented layers between cells (2) Locomotary structures
(3) Membranes connecting the nucleus with plasmalemma (4) Connections between adjacent cells

Sol. (4)

88. Which of the following is a pair of viral diseases

- (1) Ringworm, AIDS (2) Common Cold, AIDS (3) Dysentery, common cold (4) Typhoid, Tuberculosis

Sol. (2)

89. Aerobic respiratory pathway is appropriately termed

- (1) Catabolic (2) Parabolic (3) Amphibolic (4) Anabolic

Sol. (3)

90. Which of the following is not used as a biopesticide

- (1) Bacillus thuringiensis (2) Trichoderma harzianum
(3) Nuclear Polyhedrosis Virus (NPV) (4) Xanthomonas campestris

Sol. (4)

91. Alzheimer disease in humans is associated with the deficiency of

- (1) Dopamine (2) Glutamic acid
(3) Acetylcholine (4) Gamma aminobutyric acid (GABA)

Sol. (4)

92. Cytoskeleton is made up to

- (1) Calcium carbonate granules (2) Callose deposits
(3) Cellulosic microfibrils (4) Proteinaceous filaments

Sol. (4)

93. Compared to blood our lymph has

- (1) No plasma (2) Plasma without proteins (3) More WBCs and no RBCs (4) More RBCs and less WBCs

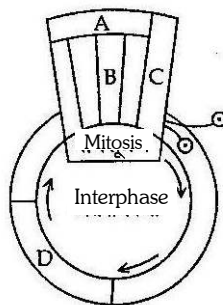
Sol. (3)

94. Which one of the following is the most likely root cause why menstruation is not taking place in regularly cycling human female

- (1) Fertilisation of the ovum
(2) Maintenance of the hypertrophical endometrial lining
(3) Maintenance of high concentration of sex-hormones in the blood stream
(4) Retention of well-developed corpus luteum

Sol. (1)

95. Given below is a schematic break-up of the phases/stages of cell cycle



Which one of the following is the correct indication of the stage/phase in the cell cycle

- (1) B-Metaphase (2) C-Karyokinesis (3) D-Synthetic phase (4) A-Cytokinesis

Sol. (3)

96. The floral formula $\oplus \frac{\text{K}_{(5)}}{\text{C}_{(5)} \text{A}_5 \underline{\text{G}}(2)}$ is that of

- (1) Tulip (2) Soybean (3) Sunnhemp (4) Tobacco

Sol. (4)

97. The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC, because "O" in it refers to having

- (1) Other antigens besides A and B on RBCs (2) Overdominance of this type of the genes for A and B types
 (3) One antibody only-either anti-A or anti-B on the RBCs (4) No antigens A and B on RBCs

Sol. (4)

98. Which one of the following statements is true regarding digestion and absorption of food in humans

- (1) Oxyntic cells in our stomach secrete the proenzyme pepsinogen.
 (2) Fructose and amino acids are absorbed through intestinal mucosa with the help of carrier ions like Na^+
 (3) Chylomicrons are small lipoprotein particles that are transported from intestine into blood capillaries
 (4) About 60% of starch is hydrolysed by salivary amylase in our mouth.

Sol. (2)

99. Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by

- (1) Absence of secondary xylem (2) Absence of secondary phloem
 (3) Presence of cortex (4) Position of protoxylem

Sol. (4)

100. Manganese is required in

- (1) Nucleic acid synthesis (2) Plant cell wall formation
 (3) Photolysis of water during photosynthesis (4) Chlorophyll synthesis

Sol. (3)

101. Which one of the following is commonly used in transfer of foreign DNA into crop plants

- (1) *Trichoderma harzianum* (2) *Meloidogyne incognita*
 (3) *Agrobacterium tumefaciens* (4) *Penicillium expansum*

Sol. (3)

102. Removal of introns and joining the exons in a defined order in a transcription unit is called

- (1) Splicing (2) Tailing (3) Transformation (4) Capping

Sol. (1)

103. Whose experiments cracked the DNA and discovered unequivocally that a genetic code is a “triplet”

- (1) Nirenberg and mathaei (2) Hershey and Chase
(3) Morgan and Sturtevant (4) Beadle and Tatum

Sol. (1)

104. Seminal plasma in humans is rich in

- (1) Fructose, calcium certain enzymes (2) Fructose and calcium but has no enzymes
(3) Glucose and certain enzymes but has no calcium (4) Fructose and certain enzymes but poor in calcium

Sol. (1)

105. Phylogenetic system of classification is based on

- (1) Evolutionary relationships (2) Morphological features
(3) Chemical constituents (4) Floral characters

Sol. (1)

106. Synapsis occurs between

- (1) A male and a female gamete (2) mRNA and ribosomes
(3) Spindle fibres and centromere (4) Two homologous chromosomes

Sol. (4)

107. Which one of the following pairs of animals comprises ‘jawless fishes’

- (1) Lampreys and eels (2) Mackerals and Rohu (3) Lampreys and hag fishes (4) Guppies and hag fishes

Sol. (3)

108. Select the incorrect statement from the following

- (1) Linkage is an exception to the principle of independent assortment in heredity
(2) Galactosemia is an inborn error of metabolism
(3) Small population size results in random genetic drift in a population
(4) Baldness is a sex-limited trait

Sol. (4)

109. The cell junctions called tight, adhering and gap junctions are found in

- (1) Muscular tissue (2) Connective tissue (3) Epithelial tissue (4) Neural tissue

Sol. (3)

110. Which one of the following types of organisms occupy more than one trophic level in a pond ecosystem

- (1) Phytoplankton (2) Fish (3) Zooplankton (4) Frog

Sol. (2)

111. Use of anti-histamines and steroids give a quick relief from

- (1) Allergy (2) Nausea
(3) Cough (4) Headache

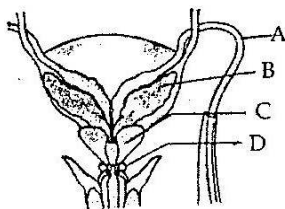
Sol. (1)

112. Which one is the wrong pairing for the disease and its causal organism

- (1) Late blight of potato – *Alternaria solani* (2) Black rust of wheat – *Puccinia graminis*
(3) Loose smut of wheat – *Ustilago nuda* (4) Root-knot of vegetables-*Meloidogyne* sp

Sol. (1)

113. Given below is a diagrammatic sketch of a portion of human male reproductive system. Select the correct set of names of the parts labelled A, B, C, D



- | | | | |
|--|--|---|--|
| <p>A</p> <p>(1) Urter</p> <p>(2) Vas deferens</p> <p>(3) Vas deferens</p> <p>(4) Ureter</p> | <p>B</p> <p>Prostate</p> <p>Seminal vesicle</p> <p>Semianl vesicle</p> <p>Seminal vesicle</p> | <p>C</p> <p>Seminal vesicle</p> <p>Prostate</p> <p>Bulboure thrall gland</p> <p>Prostate</p> | <p>D</p> <p>Bulboure thrall gland</p> <p>bulboure thrall gland</p> <p>Prostate</p> <p>Bulboure thrall gland</p> |
|--|--|---|--|

Sol. (2)

114. Vegetative propagation in mint occurs by

- | | | | |
|------------|------------|-------------|------------|
| (1) Runner | (2) Offset | (3) Rhizome | (4) Sucker |
|------------|------------|-------------|------------|

Sol. (4)

115. What will happen if the stretch receptors of the urinary bladder wall are totally removed

- | | |
|--|----------------------------------|
| (1) Urine will not collect in the bladder | (2) Micturition will continue |
| (3) Urine will continue to collect normally in the bladder | (4) There will be no micturition |

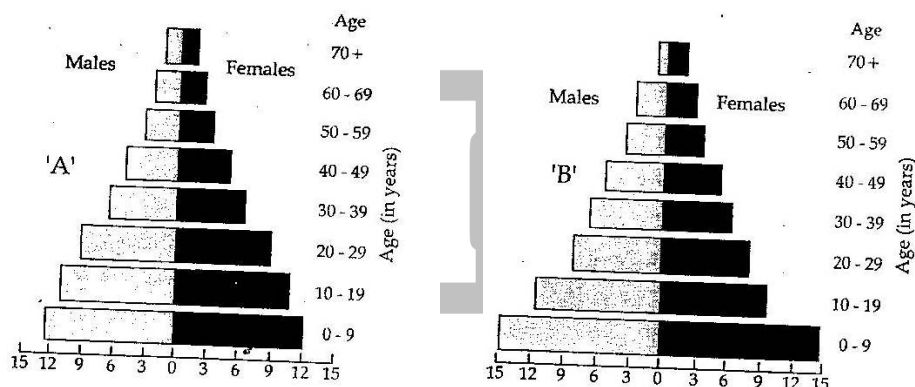
Sol. (2)

116. One of the synthetic auxin is

- | | | | |
|---------|---------|--------|---------|
| (1) NAA | (2) IAA | (3) GA | (4) IBA |
|---------|---------|--------|---------|

Sol. (1)

117. A country with a high rate of population growth took measures to reduce it. The figure below shows age-sex pyramids of populations A and B twenty years apart. Select the correct interpretation about them



Interpretations

- (1) "A" is more recent and shows slight reduction in the growth rate
- (2) "B" is ealier pyramid and shows stabilized growth rate
- (3) "B" is more recent showing that population is very young.
- (4) "A" is the earlier pyramid and no change has occurred in the growth rate

Sol. (1)

- 118.** The correct sequence of spermatogenetic stages leading to the formation of sperms in a mature human testis is
- (1) Spermatocyte – spermatogonia-spermatid-sperms (2) Spermatogonia-spermatocyte-spermatid-sperms
(3) Spermatid-spermatocyte-spermatogonia-sperms (4) Spermatogonia-spermatid-spermatocyte-sperms

Sol. (2)

- 119.** What is true about Bt toxin

- (1) The inactive protoxin gets converted into active form in the insect gut.
(2) Bt protein exists as active toxin in the Bacillus
(3) The activated toxin enters the ovaries of the pest to sterilize it and thus prevent its multiplication
(4) The concerned Bacillus has antitoxins.

Sol. (1)

- 120.** The kind of tissue that forms the supportive structure in our pinna (external sears) is also found in

- (1) Vertebrae (2) Nails (3) Ear ossicles (4) Tip of the nose

Sol. (4)

- 121.** DDT residues are rapidly passed through food chain causing biomagnification because DDT is

- (1) Lipo soluble (2) Moderately toxic (3) Non-toxic to aquatic animals (4) Water soluble

Sol. (1)

- 122.** Which one of the following is a vascular cryptogam

- (1) Equisetum (2) Ginkgo (3) Marchantia (4) Cedrus

Sol. (1)

- 123.** Steps taken by the Government of India to control air pollution include

- (1) Compulsory mixing of 20% ethyl alcohol with petrol and 20% biodiesel with diesel
(2) Compulsory PUC (Pollution Under Control) certification of petrol driven vehicles which tests for carbon monoxide and hydrocarbons
(3) Permission to use only pure diesel with a maximum of 500 ppm sulphur as fuel for vehicles
(4) Use of non-polluting compressed Natural Gas (CNG) only as fuel by all buses and trucks.

Sol. (4)

- 124.** Montreal Protocol aims at

- (1) Reduction of ozone depleting substances (2) Biodiversity conservation
(3) Control of water pollution (4) Control of CO₂ emission

Sol. (1)

- 125.** Which one of the following acids is a derivative of carotenoids

- (1) Indole butyric acid (2) Indole-3-acetic acid (3) Gibberellic acid (4) Abscisic acid

Sol. (4)

- 126.** Guard cells help in

- (1) Protection against grazing (2) Transpiration
(3) Guttation (4) Fighting against infection

Sol. (2)

- 127.** Palisade parenchyma is absent in leaves of

- (1) Sorghum (2) mustard (3) Soybean (4) Gram

Sol. (1)

- 128.** Cotyledons and testa respectively are edible parts in

- (1) Groundnut and pomegranate (2) Walnut and tamarind
(3) French bean and cocount (4) Cashew nut and litchi

Sol. (1)

129. Which one of the following is considered important in the development of seed habit
(1) Dependent sporophyte (2) Heterospory (3) Haplontic life cycle (4) Free-living gametophyte

Sol. (2)

130. T.O. Diener discovered a
(1) Free infectious RNA (2) Free infectious DNA (3) Infectious protein (4) Bacteriophage

Sol. (1)

131. Polyethylene glycol method is used for
(1) Gene transfer without a vector (2) Biodiesel production
(3) Seedless fruit production (4) Energy production from sewage

Sol. (1)

132. Which one of the following pairs is wrongly matched
(1) Detergents - lipase (2) Alcohol - nitrogenase (3) Fruit juice - pectinase (4) Textile - amylase

Sol. (2)

133. A person likely to develop tetanus is immunized by administering
(1) Dead germs (2) Preformed antibodies (3) Wide spectrum antibiotics (4) weakened germs

Sol. (2)

134. Biochemical Oxygen Demand (BOD) in a river water
(1) Remains unchanged when algal bloom occurs (2) Has no relationship with concentration of oxygen in the water
(3) Gives a measure of salmonella in the water (4) Increases when sewage gets mixed with river water

Sol. (4)

135. Which one of the following is the correct matching of the events occurring during menstrual cycle
(1) Ovulation : LH and FSH attain peak level and sharp fall in the secretion of progesterone
(2) Proliferative phase : Rapid regeneration of myometrium and maturation of Graafian follicle
(3) Development of corpus luteum : Secretory phase and increased secretion of progesterone
(4) Menstruation : Breakdown of myometrium and ovum not fertilised

Sol. (3)

136. Cyclic photophosphorylation result in the formation of
(1) NADPH (2) ATP and NADPH (3) ATP, NADPH and O₂ (4) ATP

Sol. (4)

137. Globulins contained in human blood plasma are primarily involved in
(1) Defence mechanisms of body (2) Osmotic balance of body fluids
(3) Oxygen transport in the blood (4) Clotting of blood

Sol. (1)

138. Which of the following is a symbiotic nitrogen fixer
(1) Glomus (2) Azotobacter (3) Frankia (4) Azolla

Sol. (3)

139. An example of axile placentation is
(1) Argemone (2) Dianthus (3) Lemon (4) Marigold

Sol. (3)

140. Semiconservative replication of DNA was first demonstrated in
(1) *Drosophila melanogaster* (2) *Escherichia coli*
(3) *Streptococcus pneumoniae* (4) *Salmonella typhimurium*

Sol. (2)

141. A your infant may be feeding entirely on mother's milk which is white in colour but the stools which the infant passes out is quite yellowish. What is this yellow colour due to

- (1) Intestinal juice (2) Bile pigments passed through bile
(3) Undigested milk protein casein (4) Pancreatic juice poured into duodenum

Sol. (2)

142. A fruit developed from hypanthodium inflorescence is called

- (1) Hesperidium (2) Sorosis (3) syconus (4) caryopsis

Sol. (3)

143. Which one of the following statement is correct

- (1) Patients who have undergone surgery are given cannabinoids to relieve pain
(2) Benign tumours show the property of metastasis
(3) Heroin accelerates body functions
(4) Malignant tumours may exhibit metastasis

Sol. (4)

144. Transgenic plants are the ones

- (1) Produced by a somatic embryo in artificial medium
(2) Generated by introducing foreign DNA in to a cell and regenerating a plant from that cell
(3) Produced after protoplast fusion in artificial medium
(4) Grown in artificial medium after hybridization in the field

Sol. (2)

145. The letter T in T-lymphocyte refers to

- (1) Thyroid (2) Thalamus (3) Tonsil (4) Thymus

Sol. (4)

146. Global agreement in specific control strategies to reduce the release of ozone depleting substances was adopted by

- (1) Rio de Janeiro Conference (2) The Montreal Protocol
(3) The Koyoto Protocol (4) The Vienna convention

Sol. (2)

147. Reduction in vascular tissue mechanical tissue and cuticle is characteristic of

- (1) Xerophytes (2) Mesophytes (3) Epiphyttes (4) Hydrophytes

Sol. (4)

148. An example of a seed with endoperm perisperm and caruncle is

- (1) Cotton (2) Coffee (3) Lily (4) Castor

Sol. (4)

149. What is not true for genetic code

- (1) A codon in mRNA is read in a non-contiguous fashion
(2) It is nearly universal
(3) It is degenerate
(4) It is unambiguous

Sol. (1)

150. Peripatus is a connecting link between

- (1) Ctenophora and Platyhelminthis (2) Mollusca and Echinodermata
(3) Annelida and Arthropoda (4) Coelenterata and Porifera

Sol. (3)