

AIPMT 2015 (Code: E) – DETAILED SOLUTION

Biology

91.

1.	Phytophthora	Aseptate mycelium	Basidiomycetes
2.	Alternaria	Sexual reproduction absent	Deuteromycetes
3.	Mucor	Reproduction by Conjugation	Ascomycetes
4.	Agaricus	Parastic fungus	Basidiomycetes

Sol:

Phytophthora belongs to class phycomycetes, while Mucor belong to zygomycetes. Agaricus is a saprotroph.

Hence, the correct option is (2).

92. Read the following five statements (A to E) and select the option with all correct statements :

(A) Mosses and Lichens are the first organisms to colonise a bare rock.

(B) Selaginella is a homosporous pteridophyte.

(C) Coralloid roots in Cycas have VAM.

(D) Main plant body in bryophytes is gametophytic, whereas in pteridophytes it is sporophytic.

(E) In gymnosperms, male and female gametophytes are present within sporangia located on sporophyte.

(1) (A), (C) and (D)

(2) (B), (C) and (D)

(3) (A), (D) and (E)

(4) (B), (C) and (E)

Sol:

Selaginella is a heterosporous pteridophyte, i.e. it produces both microspores and megaspores. Coralloid roots in Cycas has blue green algae (like Nostoc or Anabaena).

Hence, the correct option is (3).

93. In which of the following gametophyte is not independent free living?

- (1) Funaria
- (2) Marchantia
- (3) Pteris
- (4) Pinus

Sol:

Gametophyte is free living and independent in bryophytes (Funaria and Marchantia) and pteridophytes (Pteris). In Pinus, a gymnosperm, gametophyte is present within sporangia located on sporophyte.

Hence, the correct option is (4).

94. Which one of the following statements is wrong?

- (1) Algin and carragen are products of algae
- (2) Agar-agar is obtained from Gelidium and Gracilaria
- (3) Chlorella and Spirulina are used as space food
- (4) Mannitol is stored food in Rhodophyceae

Sol:

Food is stored in the form of floridean starch in Rhodophyceae (Red algae), while it is stored in the form of mannitol in Phaeophyceae (Brown algae).

Hence, the correct option is (4).

95. The guts of cow and buffalo possess :

- (1) Fucus spp.
- (2) Chlorella spp.
- (3) Methanogens
- (4) Cyanobacteria

Sol:

The guts of cow and buffalo possess methanogens which help them to partially digest the cellulose.

Hence, the correct option is (3).

96. Male gametes are flagellated in :

- (1) Polysiphonia
- (2) Anabaena
- (3) Ectocarpus
- (4) Spirogyra

Sol:

Male gametes are flagellated in Ectocarpus which belongs to the flagellated brown algae (Phaeophyta).

Hence, the correct option is (3).

97. Vascular bundles in monocotyledons are considered closed because :

- (1) A bundle sheath surrounds each bundle
- (2) Cambium is absent
- (3) There are no vessels with perforations
- (4) Xylem is surrounded all around by phloem

Sol:

Vascular bundles are considered closed in monocots because cambium is absent. No secondary growth is seen in monocots.

Hence, the correct option is (2).

98. Figure is the floral formula of :

- (1) Allium
- (2) Sesbania
- (3) Petunia
- (4) Brassica

Sol:

The given floral formula is of family Solanceae, to which Petunia belongs.

Hence, the correct option is (3).

99. A major characteristic of the monocot root is the presence of :

- (1) Open vascular bundles
- (2) Scattered vascular bundles
- (3) Vasculature without cambium
- (4) Cambium sandwiched between phloem and xylem along the radius

Sol:

A major characteristic of the monocot roots is the presence of vasculature without cambium.

Hence, the correct option is (3).

100. Keel is the characteristic feature of flower of :

- (1) Tulip

- (2) Indigofera
- (3) Aloe
- (4) Tomato

Sol:

Keel is a structure formed by two fused anterior petals in members (e.g. Indigofera) of Fabaceae. The characteristic aestivation present in members is vexillary. Tomato is a member of Solanaceae, while tulip and Aloe are members of Liliaceae.

Hence, the correct option is (2).

101. Perigynous flowers are found in :

- (1) Guava
- (2) Cucumber
- (3) China rose
- (4) Rose

Sol:

Perigynous flowers are those in which ovary is intermediate between epigynous and hypogynous. Example: Rose

Hence, the correct option is (4).

102. Leaves become modified into spines in :

- (1) Opuntia
- (2) Pea
- (3) Onion
- (4) Silk Cotton

Sol:

Leaves are modified into spines in Opuntia as an adaptation to xerophytic conditions so as to prevent the water loss.

Hence, the correct option is (1).

103. The structures that are formed by stacking of organized flattened membranous sacs in the chloroplasts are :

- (1) Cristae
- (2) Grana
- (3) Stroma lamellae
- (4) Stroma

Sol:

Chloroplasts are plastids involved in photosynthesis. The flattened membranous sacs found in chloroplast are called thylakoids. The stacks of thylakoids are called grana.

Hence, the correct option is (2).

104. The chromosomes in which centromere is situated close to one end are :

- (1) Metacentric
- (2) Acrocentric
- (3) Telocentric
- (4) Sub-metacentric

Sol:

Centromere is located close to one end in acrocentric chromosomes while it is located at the terminal end in telocentric chromosomes. It is at centre in metacentric and close to centre in sub-metacentric.

Hence, the correct option is (2).

105. Select the correct matching in the following pairs :

- (1) Smooth ER – Oxidation of phospholipids
- (2) Smooth ER – Synthesis of lipids
- (3) Rough ER – Synthesis of glycogen
- (4) Rough ER – Oxidation of fatty acids

Sol:

Smooth Endoplasmic reticulum is involved in synthesis of lipids as well as glycogen metabolism, whereas rough endoplasmic reticulum is involved in synthesis of proteins.

Hence, the correct option is (2).

106. True nucleus is absent in :

- (1) Anabaena
- (2) Mucor
- (3) Vaucheria
- (4) Volvox

Sol:

Anabaena is a cyanobacteria (prokaryote) lacking true nucleus. All the other options are eukaryotes. Mucor is a fungi while Vaucheria and Volvox are algae.

Hence, the correct option is (1).

107. Which one of the following is not an inclusion body found in prokaryotes?

- (1) Phosphate granule
- (2) Cyanophycean granule
- (3) Glycogen granule
- (4) Polysome

Sol:

Polysomes are multiple number of ribosomes joined to mRNA in a string-like fashion. This results in more efficient translation of mRNA molecule. Polysomes are not inclusion bodies and have been isolated from both prokaryotes and eukaryotes.

Hence, the correct option is (4).

108. Transpiration and root pressure cause water to rise in plants by :

- (1) pulling it upward

- (2) pulling and pushing it, respectively
- (3) pushing it upward
- (4) pushing and pulling it, respectively

Sol:

Transpirational pull results from transpiration of water vapour from leaves resulting in a pressure gradient that pulls water upwards. The water column thus created is continuous because of cohesive and adhesive properties of water molecules. Root pressure is the positive pressure created inside the xylem that pushes the water to move into the xylem elements.

Hence, the correct option is (2).

109. Minerals known to be required in large amounts for plant growth include :

- (1) phosphorus, potassium, sulphur, calcium
- (2) calcium, magnesium, manganese, copper
- (3) potassium, phosphorus, selenium, boron
- (4) magnesium, sulphur, iron, zinc

Sol:

Carbon, hydrogen, oxygen, nitrogen, phosphorous, sulphur, potassium, calcium and magnesium are macronutrients for plants, while manganese, iron, zinc, boron, copper, molybdenum and chlorine are micronutrients.

Hence, the correct option is (1).

110. What causes a green plant exposed to the light on only one side, to bend toward the source of light as it grows?

- (1) Green plants need light to perform photosynthesis.
- (2) Green plants seek light because they are phototropic.
- (3) Light stimulates plant cells on the lighted side to grow faster.
- (4) Auxin accumulates on the shaded side, stimulating greater cell elongation there.

Sol:

Auxin is a plant growth regulator that responds to the blue component of light and from the tip, gets transferred more to the shaded side of plant, where it causes cell expansion, thus bending the plant in the direction towards light.

Hence, the correct option is (4).

111. In a ring girdled plant :

- (1) The shoot dies first
- (2) The root dies first
- (3) The shoot and root die together
- (4) Neither root nor shoot will die

Sol:

Translocation of food from the shoot towards the root taking place via phloem does not occur in the ring girdled experiment due to removal of phloem. Thus, the roots die first in the experiment.

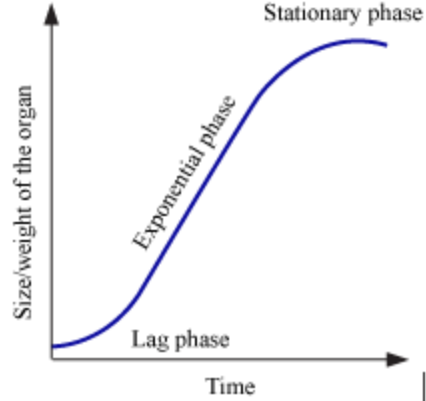
Hence, the correct option is (2).

112. Typical growth curve in plants is :

- (1) Sigmoid
- (2) Linear
- (3) Stair-steps shaped
- (4) Parabolic

Sol:

Typical growth curve observed in plants is sigmoid. Initial growth is slow (lag phase), followed by a rapid increase in growth (log/exponential phase), followed by a phase where growth slows down (stationary phase).



Hence, the correct option is (1).

113. Which one gives the most valid and recent explanation for stomatal movements ?

- (1) Transpiration
- (2) Potassium influx and efflux
- (3) Starch hydrolysis
- (4) Guard cell photosynthesis

Sol:

The most recent and valid explanation for stomatal movement, i.e. opening and closing of stomata occurs in response to the influx and efflux of potassium ions.

Hence, the correct option is (2).

114. The hilum is a scar on the :

- (1) Seed, where funicle was attached
- (2) Fruit, where it was attached to pedicel
- (3) Fruit, where style was present
- (4) Seed, where micropyle was present

Sol:

Hilum is a scar on a seed, to which funiculus was attached.

Hence, the correct option is (1).

115. Which one of the following may require pollinators, but is genetically similar to autogamy ?

- (1) Geitonogamy
- (2) Xenogamy
- (3) Apogamy
- (4) Cleistogamy

Sol:

Geitonogamy is type of pollination in which pollens are transferred from anther of one flower to the stigma of another flower, in same plant. It may require action of a pollinator but is genetically similar to autogamy in which pollens are transferred to stigma in same flower.

Hence, the correct option is (1).

116. Which one of the following statements is not true ?

- (1) Pollen grains are rich in nutrients, and they are used in the form of tablets and syrups
- (2) Pollen grains of some plants cause severe allergies and bronchial afflictions in some people
- (3) The flowers pollinated by flies and bats secrete foul odour to attract them
- (4) Honey is made by bees by digesting pollen collected from flowers

Sol:

Honey is made by honey bees from nectar and not from pollen. The nectar is partially digested by honey bees with repeated regurgitation and by evaporation. Honey is stored in the bee hives.

Hence, the correct option is (4).

117. Transmission tissue is characteristic feature of :

- (1) Hollow style

- (2) Solid style
- (3) Dry stigma
- (4) Wet stigma

Sol:

Transmission tissue helps to direct the pollen tube in the style. Thus, it is a characteristic feature of solid style.

Hence, the correct option is (2).

118. In ginger vegetative propagation occurs through :

- (1) Rhizome
- (2) Offsets
- (3) Bulbils
- (4) Runners

Sol:

Rhizome is the underground modification of stem from which new plant can arise as in case of ginger.

Hence, the correct option is (1).

119. Which of the following are the important floral rewards to the animal pollinators ?

- (1) Colour and large size of flower
- (2) Nectar and pollen grains
- (3) Floral fragrance and calcium crystals
- (4) Protein pellicle and stigmatic exudates

Sol:

Nectar and pollen grains are the important floral rewards for the animal pollinators such as bees and birds.

Hence, the correct option is (2).

120. How many pairs of contrasting characters in pea plants were studied by Mendel in his experiments ?

- (1) Five
- (2) Six
- (3) Eight
- (4) Seven

Sol:

Seven pairs of contrasting characters were used by Mendel for his experiments.

Hence, the correct option is (4).

121. Which is the most common mechanism of genetic variation in the population of a sexually-reproducing organism ?

- (1) Transduction
- (2) Chromosomal aberrations
- (3) Genetic drift
- (4) Recombination

Sol:

Recombination takes place during pachytene in Prophase - I in meiosis during crossing over. It is the most common method of producing genetic variations in sexually reproducing organisms.

Genetic drift is the change in allele frequency due to random sampling. Transduction is transfer of genetic material from one bacteria to other through virus. Chromosomal aberrations can lead to diseases like cri-du-chat syndrome.

Hence, the correct option is (4).

122. A technique of micropropagation is :

- (1) Somatic hybridization
- (2) Somatic embryogenesis
- (3) Protoplast fusion
- (4) Embryo rescue

Sol:

Multiplication of genetically identical copies of plants through asexual reproduction is called clonal propagation. Using tissue culture, large number of such plants can be produced. This is called micropropagation. Somatic embryogenesis involves formation of embryos from somatic cell or cells.

Hence, the correct option is (2).

123. The movement of a gene from one linkage group to another is called :

- (1) Inversion
- (2) Duplication
- (3) Translocation
- (4) Crossing over

Sol:

Translocation involves movement of a gene from one linkage group to another, whereas crossing over involves movement of genetic material between homologous chromosomes.

Hence, the correct option is (3).

124. Multiple alleles are present :

- (1) On different chromosomes
- (2) At different loci on the same chromosome
- (3) At the same locus of the chromosome
- (4) On non-sister chromatids

Sol:

Multiple alleles are variation of alleles in a population and are present at the same locus of the chromosome. An example of multiple allelism in humans is of ABO blood group.

Hence, the correct option is (3).

125. Which body of the Government of India regulates GM research and safety of introducing GM organisms for public services ?

- (1) Bio - safety committee
- (2) Indian Council of Agricultural Research
- (3) Genetic Engineering Approval Committee
- (4) Research Committee on Genetic Manipulation

Sol:

Indian government has set up an organisation, Genetic Engineering Approval Committee (GEAC), which makes decisions regarding validity of GM research and its use for public utility.

Hence, the correct option is (3).

126. In Bt cotton, the Bt toxin present in plant tissue as pro - toxin is converted into active toxin due to :

- (1) alkaline pH of the insect gut
- (2) acidic pH of the insect gut
- (3) action of gut micro-organisms
- (4) presence of conversion factors in insect gut

Sol:

The pro-toxin is converted to active toxin in the alkaline pH of the insect gut. Activated toxin binds to the epithelial cells in the midgut of insect and creates pores that cause lysis and swelling, eventually leading to the death of insect.

Hence, the correct option is (1).

127. The crops engineered for glyphosate are resistant/ tolerant to :

- (1) Fungi
- (2) Bacteria
- (3) Insects
- (4) Herbicides

Sol:

Glyphosate is a herbicide used to kill weeds. The crops engineered for resistance against it have an additional enzyme in them that is resistant of inhibition by this herbicide.

Hence, the correct option is (4).

128. DNA is not present in :

- (1) Chloroplast
- (2) Ribosomes
- (3) Nucleus
- (4) Mitochondria

Sol:

Ribosomes are cell organelles that consist of RNA and proteins. They do not have DNA.

Hence, the correct option is (2).

129. Which of the following enhances or induces fusion of protoplasts ?

- (1) Sodium chloride and potassium chloride
- (2) Polyethylene glycol and sodium nitrate
- (3) IAA and kinetin
- (4) IAA and gibberellins

Sol:

Protoplasts are cells devoid of cell wall. Two protoplasts from different species can be fused to create a somatic hybrid. The fusion can be induced by polyethylene glycol (PEG) and calcium ions or sodium nitrate.

Hence, the correct option is (2).

130. The UN Conference of Parties on climate change in the year 2011 was held in :

- (1) Poland
- (2) South Africa
- (3) Peru
- (4) Qatar

Sol:

UN Conference of Parties (COP) on climate change in 2011 was held in Durban, South Africa.

Hence, the correct option is (2).

131. Vertical distribution of different species occupying different levels in a biotic community is known as :

- (1) Divergence
- (2) Stratification
- (3) Zonation
- (4) Pyramid

Sol:

Vertical distribution of different species occupying different levels in a biotic community is known as stratification.

Hence, the correct option is (2).

132. In which of the following both pairs have correct combination ?

- (1) In situ conservation : National Park
Ex situ conservation : Botanical Garden
- (2) In situ conservation : Cryopreservation
Ex situ conservation : Wildlife Sanctuary
- (3) In situ conservation : Seed Bank
Ex situ conservation : National Park
- (4) In situ conservation : Tissue culture
Ex situ conservation : Sacred groves

Sol:

In situ methods of conservation include on-site protection, i.e. at their natural habitat, for organisms. These include national parks, biosphere reserves and sacred groves.

Ex situ methods of conservation include off site protection, i.e. animals or plants are taken out of their natural habitat. These include, botanical gardens, seed banks, cryopreservation, tissue culture, etc.

Hence, the correct option is (1).

133. Secondary Succession takes place on/in :

- (1) Bare rock
- (2) Degraded forest
- (3) Newly created pond
- (4) Newly cooled lava

Sol:

Succession happens in areas where no life forms ever existed as in bare rocks, cool lava, newly created ponds, etc. (primary succession), or in areas which have lost all life forms due to destruction or floods (secondary succession).

Hence, the correct option is (2).

134. The mass of living material at a trophic level at a particular time is called :

- (1) Gross primary productivity
- (2) Standing state
- (3) Net primary productivity
- (4) Standing crop

Sol:

The mass of living material at a trophic level at a particular time is called standing crop.

Hence, the correct option is (4).

135. In an ecosystem the rate of production of organic matter during photosynthesis is termed as :

- (1) Net primary productivity
- (2) Gross primary productivity

- (3) Secondary productivity
- (4) Net Productivity

Sol:

GPP is the rate of production of organic matter during photosynthesis.

Hence, the correct option is (2).

136. Which of the following characteristics is mainly responsible for diversification of insects on land ?

- (1) Segmentation
- (2) Bilateral symmetry
- (3) Exoskeleton
- (4) Eyes

Sol:

Exoskeleton provides protection from attack or injury and assures mechanical advantage to the muscles of insects aiding to their diversification.

Hence, the correct option is (3).

137. Which of the following endoparasites of human does show viviparity ?

- (1) *Ancylostoma duodenale*
- (2) *Enterobius vermicularis*
- (3) *Trichinella spiralis*
- (4) *Ascaris lumbricoides*

Sol:

The adult female *Trichinella spiralis* gives birth to batches of live larvae and therefore, is viviparous whereas, the other three are egg laying endoparasites.

Hence the correct option is (3)

138. Which of the following represents the correct combination without any exception ?

	Characteristics	Class
1.	Mammary gland; hair on body; pinnae; two pairs of limbs	Mammalia
2.	Mouth ventral; gills without operculum; skin with placoid scales; persistent notochord	Chondrichthyes
3.	Sucking and circular mouth; jaws absent, integument without scales; paired appendages	Cyclostomata
4.	<i>Body covered with feathers; skin moist and glandular; fore-limbs form wings; lungs with air sacs</i>	Aves

Sol:

Whales do not have pinnae, paired appendages are not present in Cyclostomata and Aves have non glandular skin.

Hence, the Correct option is (2).

139. Which of the following animals is not viviparous ?

- (1) Flying fox (Bat)
- (2) Elephant
- (3) Platypus
- (4) Whale

Sol:

Flying fox (Bat), elephant and whale are viviparous animals. Among the listed animals Platypus is the only mammal that is oviparous.

Hence the correct option is (3)

140. Erythropoiesis starts in :

- (1) Kidney
- (2) Liver

- (3) Spleen
- (4) Red bone marrow

Sol:

Erythropoiesis is a process through which new red blood cells are formed. It begins in the liver in foetal stage. As the organism grows, this function is taken over by the red bone marrow.

Hence, the correct option is (2)

141. The terga, sterna and pleura of cockroach body are joined by :

- (1) Cementing glue
- (2) Muscular tissue
- (3) Arthroial membrane
- (4) Cartilage

Sol:

Terga, sterna and Pleura are joined by arthroial membrane.

Hence, the correct option is (3).

142. Nuclear envelope is a derivative of :

- (1) Smooth endoplasmic reticulum
- (2) Membrane of Golgi complex
- (3) Microtubules
- (4) Rough endoplasmic reticulum

Sol:

The nuclear envelope is a derivative of the rough endoplasmic reticulum (RER).

Hence, the correct option is (4).

143. Cytochromes are found in :

- (1) Matrix of mitochondria
- (2) Outer wall of mitochondria
- (3) Cristate of mitochondria
- (4) Lysosomes

Sol:

Cytochromes are the part of electron transport chain and are present on the cristae of mitochondria. Hence, the correct option is (3).

144. Which one of the following statements is incorrect?

- (1) A competitive inhibitor reacts reversibly with the enzyme to form an enzyme-inhibitor complex.
- (2) In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme.
- (3) The competitive inhibitor does not affect the rate of breakdown of the enzyme-substrate complex.
- (4) The presence of the competitive inhibitor decreases the K_m of the enzyme for the substrate.

Sol:

The effect of competitive inhibition on reaction is that substrate concentration needs to be increased to achieve a given reaction velocity, hence the K_m is increased.

Hence the correct option is (4)

145.

	I		II
a.	Synapsis aligns homologous chromosomes	(i)	Anaphase-II
b.	Synthesis of RNA and protein	(ii)	Zygotene
c.	Action of enzyme recombinase	(iii)	G2-phase
d.	Centromeres do not separate but chromatids moves towards opposite poles	(iv)	Anaphase-I
		(v)	Pachytene

- | | (a) | (b) | (c) | (d) |
|-----|------|-------|-------|------|
| (1) | (ii) | (i) | (iii) | (iv) |
| (2) | (ii) | (iii) | (v) | (iv) |
| (3) | (i) | (ii) | (v) | (iv) |
| (4) | (ii) | (ii) | (iv) | (v) |

Sol:

Synapsis aligns homologous chromosomes in anaphase II.

Synthesis of RNA and protein occurs in zygotene.

Recombinase enzyme works in Pachytene stage.

In Anaphase I, centromere do not separate and chromatids move towards opposite ends.

Hence, the correct option is (3)

146. A somatic cell that has just completed the S phase of its cell cycle, as compared to gamete of the same species, has :

- (1) twice the number of chromosomes and twice the amount of DNA
- (2) same number of chromosomes but twice the amount of DNA
- (3) twice the number of chromosomes and four times the amount of DNA
- (4) four times the number of chromosomes and twice the amount of DNA

Sol:

After S phase, the amount of DNA is doubled as the chromosomes are replicated. Following replication, each chromosome now consists of two sister chromatids . Thus, the amount of DNA in the cell has effectively doubled but the chromosome count of the cell remains at $2n$.

Compared to a gamete (haploid, n) of same species, the amount of DNA will be four times to it and chromosome number will be twice in the somatic cell.

Hence, the correct option is (3).

147. Which of the following statements is not correct?

- (1) Brunner's glands are present in the submucosa of stomach and secrete pepsinogen
- (2) Goblet cells are present in the mucosa of intestine and secrete mucus

- (3) Oxyntic cells are present in the mucosa of stomach and secrete HCl.
- (4) Acini are present in the pancreas and secrete carboxypeptidase

Sol:

Brunner's glands are present on the submucosa of duodenum and its function is to secrete mucous.

Hence the correct option is (1).

148. Gastric juice of infants contains:

- (1) maltase, pepsinogen, rennin
- (2) nuclease, pepsinogen, lipase
- (3) pepsinogen, lipase, rennin
- (4) amylase, rennin, pepsinogen

Sol:

Gastric juice of infants contains pepsinogen, lipase, and rennin. Rennin is a protease enzyme that is involved in milk-curdling and is also produced in the stomach of calves and other ruminants.

Hence, the correct option is (3).

149. When you hold your breath, which of the following gas changes in blood would first lead to the urge to breathe?

- (1) falling O₂ concentration
- (2) rising CO₂ concentration
- (3) falling CO₂ concentration
- (4) rising CO₂ and falling O₂ concentration

Sol:

Chemoreceptors in aorta and carotid artery are stimulated by the increase of CO₂ concentration which further stimulate respiratory centre and hence compel for breathing.

Hence, the correct option is (2).

150. Blood pressure in the mammalian aorta is maximum during:

- (1) Systole of the left atrium
- (2) Diastole of the right ventricle
- (3) Systole of the left ventricle
- (4) Diastole of the right atrium

Sol:

Blood is pumped to aorta by left ventricle systole (contraction) under the high pressure.

Hence, the correct option is (3).

151. Which one of the following is correct ?

- (1) Plasma = Blood - Lymphocytes
- (2) Serum = Blood + Fibrinogen
- (3) Lymph = Plasma + RBC + WBC
- (4) Blood = Plasma + RBC + WBC + Platelets

Sol:

The main components of blood include

Plasma

Red blood cells

White blood cells

Platelets

Hence, the correct option is (4).

152. Removal of proximal convoluted tubule from the nephron will result in :

- (1) More diluted urine
- (2) More concentrated urine
- (3) No change in quality and quantity of urine
- (4) no urine formation

Sol:

The main function of proximal convoluted tubule is reabsorption of water by the transport of sodium ions from lumen into blood. Majority of the nutrients, electrolytes and water is absorbed through this segment. So if it is removed the reabsorption of water will get decreased, resulting into formation of more dilute urine.

Hence, the correct option is (1).

153. Sliding filament theory can be best explained as :

- (1) When myofilaments slide pass each other Actin filaments shorten while Myosin filament do not shorten
- (2) Actin and Myosin filaments shorten and slide pass each other
- (3) Actin and Myosin filaments do not shorten but rather slide pass each other
- (4) When myofilaments slide pass each other, Myosin filaments shorten while Actin filaments do not shorten

Sol:

The sliding filament theory states that proteins called actin and myosin filaments slide in relation with each other to bring about muscle contraction. There is no shortening of these myofilaments. They just slide past each other.

Hence, the correct option is (3).

154. Glenoid cavity articulates :

- (1) clavicle with acromion
- (2) scapula with acromion
- (3) clavicle with scapula
- (4) humerus with scapula

Sol:

Glenoid Cavity is located on the lateral angle of the scapula. It is directed laterally and forward and articulates with the head of the humerus. This joint is a type of ball and socket joint.

Hence the correct option is (4).

155. Which of the following regions of the brain is incorrectly paired with its function ?

- (1) Medulla oblongata - homeostatic control
- (2) Cerebellum - language comprehension
- (3) Corpus callosum - communication between the left and right cerebral cortices
- (4) Cerebrum - calculation and contemplation

Sol:

The cerebellum (part of hind brain) functions to regulate voluntary motor movements such as posture, balance, coordination, and speech, resulting in smooth, balanced muscular activity.

Hence, the correct option is (2).

156. A gymnast is able to balance his body upside down even in the total darkness because of :

- (1) Cochlea
- (2) Vestibular apparatus
- (3) Tectorial membrane
- (4) Organ of Corti

Sol:

Vestibular apparatus together with the cochlea makes up the labyrinth of inner ear and is responsible for the sense of balance and orientation. It consists of 3 semi-circular canals, base of which consist of ampulla, and otolith organ, which consist of utricle and saccule which have a projecting ridge called macula.

Hence the correct option is (2).

157. A chemical signal that has both endocrine and neural roles is :

- (1) Melatonin
- (2) Calcitonin
- (3) Epinephrine
- (4) Cortisol

Sol:

Epinephrine has dual roles as endocrine and neural roles as it is secreted by adrenal medulla glands and is also produced at the ends of sympathetic nerve fibres.

Hence, the correct option is (3).

158. Which of the following does not favour the formation of large quantities of dilute urine ?

- (1) Alcohol
- (2) Caffeine
- (3) Renin
- (4) Atrial-natriuretic factor

Sol:

RAAS system stands for renin - angiotensin - aldosterone system, which is activated by renin secreted by JG cells in kidney which sense low GFR or low blood pressure. Renin converts angiotensinogen to angiotensin - I which is further converted to angiotensin - II. Angiotensin - II is a powerful vasoconstrictor and also promotes secretion of aldosterone from adrenal cortices, which increases the reabsorption of sodium ions and hence of water. This leads to formation of more concentrated urine.

Hence the correct option is (3).

159. Capacitation refers to changes in the :

- (1) sperm before fertilization
- (2) ovum before fertilization
- (3) ovum after fertilization
- (4) sperm after fertilization

Sol:

Spermatozoa must undergo certain changes that make it enable to penetrate and fertilise egg. These changes occur in female genital tract after ejaculation. This is called capacitation.

Hence, the correct option is (1).

160. Which of these is not an important component of initiation of parturition in humans ?

- (1) Increase in estrogen and progesterone ratio
- (2) Synthesis of prostaglandins
- (3) Release of oxytocin
- (4) Release of prolactin

Sol:

Parturition is the process of giving birth to the child. Oxytocin secreted by posterior pituitary, stimulates the contraction of uterus. Prostaglandins also increase the uterine contractility.. Ratio of estrogen and progesterone is increased as estrogen also increases uterine contractility.

Prolactin is a hormone that plays role in lactation along with oxytocin.

Hence the correct option is (4).

161. Which of the following viruses is not transferred through semen of an infected male ?

- (1) Hepatitis B virus
- (2) Human immunodeficiency virus
- (3) Chikungunya virus
- (4) Ebola virus

Sol:

Hepatitis B, Ebola Virus and HIV can be transmitted from human to human as they are present in blood, secretions (including semen) or other bodily fluids of infected people.

Chikungunya virus is transmitted by mosquito Aedes.

Hence, the correct option is (3).

162. Which of the following cells during gametogenesis is normally diploid ?

- (1) Primary polar body
- (2) Spermatid

- (3) Spermatogonia
- (4) Secondary polar body

Sol:

During gametogenesis, some spermatogonia (immature germ cells) present in seminiferous tubules undergo meiosis to become spermatids which later become sperms. By the process of spermatogenesis each one of the diploid spermatogonium divide into four haploid sperm cells. All other given options are haploid.

Hence, the correct option is (3).

163. Hysterectomy is surgical removal of :

- (1) Uterus
- (2) Prostate gland
- (3) Vas-deference
- (4) Mammary glands

Sol:

Removal of uterus is called hysterectomy.

Hence, the correct option is (1).

164. Which of the following is not a sexually transmitted disease ?

- (1) Syphilis
- (2) Acquired Immuno Deficiency Syndrome (AIDS)
- (3) Trichomoniasis
- (4) Encephalitis

Sol:

Syphilis, AIDS and trichomoniasis are sexually transmitted diseases caused by a bacteria, a virus and a protozoan respectively. Encephalitis is the inflammation of brain that can be virus, bacteria or by attack of body's own immune system on brain tissue.

Hence the correct option is (4).

165. An abnormal human baby with 'XXX' sex chromosomes was born due to :

- (1) formation of abnormal sperms in the father
- (2) formation of abnormal ova in the mother
- (3) fusion of two ova and one sperm
- (4) fusion of two sperms and one ovum

Sol:

Formation of abnormal ova containing two X chromosomes instead of one will lead to an abnormal human baby with XXX sex chromosomes.

Hence the correct option is (2).

166. Alleles are :

- (1) different phenotype
- (2) true breeding homozygotes
- (3) different molecular forms of a gene
- (4) heterozygotes

Sol:

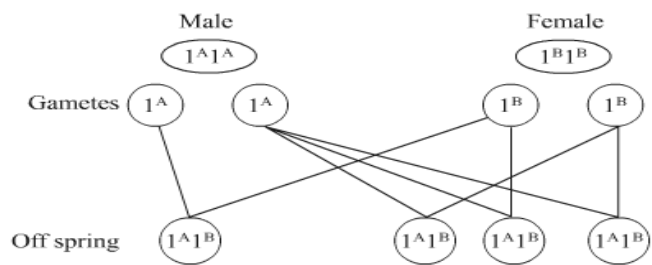
Alleles refers to the different molecular forms of a gene that controls different traits in an individual.

Hence, the correct option is (3).

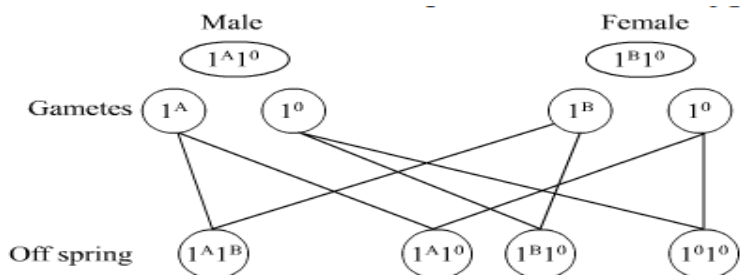
167. A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offsprings ?

- (1) A and B only
- (2) A, B and AB only
- (3) A, B, AB and O
- (4) O only

Sol:



In the above scenario, both parents are homozygous and all offsprings have AB blood group.



In this scenario, both parents are heterozygous and in offsprings all blood groups are possible.

Hence, the correct option is (3).

168. Gene regulation governing lactose operon of E.coli that involves the lac I gene product is :

- (1) Positive and inducible because it can be induced by lactose
- (2) negative and inducible because repressor protein prevents transcription.
- (3) negative and repressible because repressor protein prevents transcription
- (4) Feed back inhibition because excess of β -galactosidase can switch off transcription

Sol:

Gene regulation governing lactose operon of E.coli that involves the lac I gene product is negative and repressible because repressor protein prevents transcription.

Hence, the correct option is (3).

169. In sea urchin DNA, which is double stranded, 17% of the bases were shown to be cytosine. The percentages of the other three bases expected to be present in this DNA are :

- (1) G 34%, A 24.5%, T 24.5%
- (2) G 17%, A 16.5%, T 32.5%
- (3) G 17%, A 33%, T 33%
- (4) G 8.5%, A 50%, T 24.5%

Sol:

According to Chargaff's rule,

$$[A]+[G]=[C]+[T] \text{ and } [A]=[T]; [C]=[G]$$

So, if C= 17%

Then, G= 17%

$$A+G+C+T= 100\%$$

$$A+(17+17)+T = 100$$

$$A+T = 100 - 34$$

$$2A = 66$$

$$A = 33\%$$

$$A=T$$

Thus, $T = 33\%$

Hence, the correct option is (3).

170. Which of the following had the smallest brain capacity ?

- (1) Homo erectus
- (2) Homo sapiens
- (3) Homo neanderthalensis
- (4) Homo habilis

Sol:

Species	Brain Capacity
Homo erectus	900 cc
Homo sapiens	1350 cc
Homo neanderthalis	1400 cc
Homo habilis	650 cc-800 cc

Hence the correct option is (4).

171. A population will not exist in Hardy-Weinberg equilibrium if :

- (1) individuals mate selectively
- (2) there are no mutations
- (3) there is no migration
- (4) the population is large

Sol:

If individuals mate selectively in a population then the population will not exist in Hardy-Weinburg equilibrium

Hence, the correct option is (1).

172. Match each disease with its correct type of vaccine :

- | | | | |
|-----|----------------|-------|-------------------|
| (a) | tuberculosis | (i) | harmless virus |
| (b) | harmless virus | (ii) | inactivated toxin |
| (c) | diphtheria | (iii) | killed bacteria |
| (d) | polio | (iv) | harmless bacteria |

- | | | | | |
|-----|-------|-------|-------|-------|
| | (a) | (b) | (c) | (d) |
| (1) | (ii) | (i) | (iii) | (iv) |
| (2) | (iii) | (ii) | (iv) | (i) |
| (3) | (iv) | (iii) | (ii) | (i) |
| (4) | (i) | (ii) | (iv) | (iii) |

Sol:

Disease

Tuberculosis

Whooping Cough

Diphtheria

Polio

Vaccine

Attenuated bacteria (harmless)

Killed bacteria (Bordetella pertussis)

Inactivated toxin

Harmless virus

Hence, the correct option is (3).

173. Hiv that causes AIDS, first starts destroying :

- (1) B - Lymphocytes
- (2) Leucocytes
- (3) Helper T - Lymphocytes
- (4) Thrombocytes

Sol:

HIV first starts destroying helper T-lymphocytes. T lymphocytes help in fighting against infections in the body.

Hence, the correct option is (3).

174. The active form of *Entamoeba histolytica* feeds upon :

- (1) erythrocytes; mucosa and submucosa of colon
- (2) mucosa and submucosa of colon only
- (3) food in intestine
- (4) blood only

Sol:

Active form of *Entamoeba histolytica* feeds upon erythrocytes, mucosa and sub mucosa of colon.

Hence, the correct option is (1).

175. High value of BOD (Biochemical Oxygen Demand) indicates that :

- (1) water is pure
- (2) water is highly polluted
- (3) water is less polluted
- (4) consumption of organic matter in the water is higher by the microbes

Sol:

High BOD indicates presence of more organic waste in water body; thus, more pollution.

Hence the correct option is (2).

176. Most animals are tree dwellers in a:

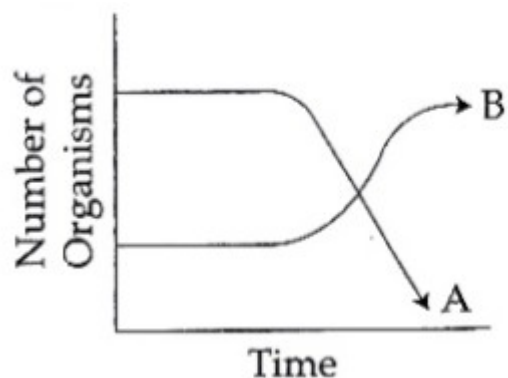
- (1) coniferous forest
- (2) thorn woodland
- (3) temperate deciduous forest
- (4) tropical rain forest

Sol:

Most animals are tree dwellers in tropical rain forests as tropical rain forests have striated vegetation.

Hence, the correct answer is (4).

177. The following graph depicts changes in two populations (A and B) of herbivores in a grassy field. A possible reason for these changes is that:



- (1) Both plant populations in this habitat decreased
- (2) Population B competed more successfully for food than population A
- (3) Population A produced more offspring than population B
- (4) Population A consumed the members of population B

Sol:

Both the populations A and B are herbivores; so, there will be competition between both of them for food. The population which will succeed in this competition will survive. In this case, population B has competed better than population A.

Hence the correct option is (2).

178. Cryopreservation of gametes of threatened species in viable and fertile condition can be referred to as:

- (1) In situ conservation of biodiversity
- (2) Advanced ex-situ conservation of biodiversity
- (3) In situ conservation by sacred groves
- (4) In situ cryo-conservation of biodiversity

Sol:

Cryopreservation of gametes of threatened species in viable and fertile condition can be referred to as advanced ex-situ conservation of biodiversity. In this method, the genes or gene pools are stored under liquid nitrogen at -196 degrees Celsius.

Hence, the correct option is (2).

179. Rachel Carson's famous book "Silent Spring" is related to:

- (1) Pesticide pollution
- (2) Noise pollution
- (3) Population explosion
- (4) Ecosystem management

Sol:

The book "Silent Spring" is related to pesticide pollution.

Hence, the correct option is (1).

180. Which of the following is not one of the prime health risks associated with greater UV radiation through the atmosphere due to depletion of stratospheric ozone?

- (1) Increased skin cancer
- (2) Reduced Immune System
- (3) Damage to eyes
- (4) Increased liver cancer

Sol:

Over exposure to UV rays may lead to harmful effects on the skin, eye, and immune system.

Hence, the correct option is (4).