

- Botany :** Sexual Reproduction in Flowering Plants, Principles of Inheritance and Variations, Molecular Basis of Inheritance, Organisms and Population, Ecosystem, Biodiversity and Conservation, Environmental Issues, Strategies for Enhancement in Food Production (Plant Section)
- Zoology :** Reproduction in Organisms, Human Reproduction, Reproductive Health, Evolution, Human Health & Diseases, Microbes in Human Welfare, Biotechnology : Principles & Process, Biotechnology & its Applications, Strategies for Enhancement in food production (Animal Section)

BOTANY

101. Match these components of the lac operon with their function and mark the correct option

Components	Function
1. Operator	a. Codes for synthesis of repressor
2. Promoter	b. Codes for an enzyme
3. Regulator gene	c. is inactivated when attached to lactose
4. Repressor	d. R.N.A. polymerase attaches here
5. Structural gene	e. Repressor attaches here

- (1) 1-b; 2-d; 3-c; 4-a; 5-c
 (2) 1-e; 2-d; 3-a; 4-c; 5-b
 (3) 1-c; 2-a; 3-d; 4-e; 5-b
 (4) 1-d; 2-c; 3-b; 4-a; 5-e

102. Dachigam national park of J & K is famous for

- (1) Tiger (2) Chiru
 (3) Hangul (4) Siberian crane

103. A species or a group of species whose impact on its community or ecosystem is much larger and more influential than would be expected from more abundance is called

- (1) Cenospecies (2) Ecospecies
 (3) Dominant species (4) Keystone species

104. Two true-breeding varieties of garden peas are crossed one parent had red, axial flowers and the other had white, terminal flowers. All F_1 individuals had Red, axial flowers. If 100 F_2 offspring were counted, how many of them would you expect to have Red, terminal flowers?

- (1) 6 (2) 19
 (3) 25 (4) 56

105. The genetic event that results in Turner syndrome (XO) is probably

- (1) Non-disjunction (2) Parental imprinting
 (3) Deletion (4) Translocation

106. For the discovery of D.N.A. structure, Nobel prize was given to Watson, Crick and

- (1) Franklin (2) Wilkins
 (3) Pauling (4) Astbury

107. cDNA can be formed by

- (1) Transaminase
 (2) D.N.A. ligase
 (3) R.N.A. dependent D.N.A. polymerase
 (4) D.N.A. dependent D.N.A. polymerase

108. Nitrate ions are thought to be harmful to human if large quantities present in drinking water. It results into an illness called

- (1) Minimatadisease (2) Blue baby syndrome
 (3) Itai-Itai disease (4) Phocomalea

109. The joining of nucleotides in the polymerization of D.N.A. requires energy from

- (1) D.N.A. polymerase
 (2) the hydrolysis of the terminal phosphate group of ATP
 (3) The hydrolysis of GTP
 (4) The hydrolysis of phosphates from nucleoside triphosphate

110. RNA Polymerase

- (1) is the protein responsible for the production of ribonucleotides
 (2) is the enzyme that creates hydrogen bonds between nucleotides on the DNA template strand and their complementary R.N.A.
 (3) begins transcription at a promoter sequence and moves along the template strand of D.N.A. in a $5' \longrightarrow 3'$ direction
 (4) is the enzyme that transcribes exons, but not transcribe introns.

111. According to Genic balance theory, if the value of X/A ratio is less than 1, then the individual Drosophilla will be

- (1) Diploid female (2) Inter sex
 (3) Super female (4) Super male

112. During the transcription of DNA, the DNA strand oriented in $5' \longrightarrow 3'$ direction is called

- (1) Template and antisense strand
 (2) Template and sense strand
 (3) Non-template and antisense strand
 (4) Non-template and sense strand

113. In which of the following blotting technique the protein is denatured with SDS (Sodium dodecyl Sulphate)?
 (1) Southern blotting (2) Northern blotting
 (3) Eastern blotting (4) Western blotting
114. Which of the following vector has both centromere and telomere?
 (1) BAC (2) YAC
 (3) Cosmid (4) All of these
115. Predation and parasitism are similar in that both can be characterised as
 (1) + / + interactions
 (2) + / - interactions
 (3) + / 0 interactions
 (4) Symbiotic interaction
116. The open ocean and tropical rain forest are the two largest contributors to earth's net primary productivity because
 (1) both have high rate of net primary productivity
 (2) both cover large surface area of the earth
 (3) the ocean covers a large surface area and the tropical rain forest has a high rate of productivity
 (4) both (1) and (2) are correct
117. Carbon dioxide is called a green house gas because
 (1) It is used in greenhouses to increase plant growth
 (2) It is transparent to sunlight but opaque to heat radiation
 (3) It is transparent to heat radiation but opaque to sunlight
 (4) It is opaque to both sunlight and heat radiation.
118. In almost all Indian metropolitan cities like Delhi, the major atmosphere pollutant(s) is / are
 (1) suspended particulate matter
 (2) oxides of sulphur
 (3) carbon dioxide and carbon monoxide
 (4) oxides of nitrogen
119. When some physical barriers exist between the stamens and carpels to check self pollination, it is known as
 (1) Herkogamy (2) Dichogamy
 (3) Diclony (4) Protogyny
120. The remnants of nucellus in seed after fertilization
 (1) Perithecium (2) Perisperm
 (3) Endothecium (4) Pericarp
121. If anther wall consists of four layers
 (1) Endothecium lies in between epidermis and tapetum
 (2) Middle layers lie in between endothecium and tapetum
 (3) Tapetum lies in between endothecium and middle layers
 (4) Endothecium lies in between middle layers and tapetum
122. When only the first division of primary endosperm is followed up by wall formation, the endosperm is termed
 (1) nuclear endosperm (2) cellular endosperm
 (3) helobiar endosperm (4) ruminant endosperm
123. When micropylar chalazal line lies at right angle to the funicle, the ovule is known as
 (1) orthotropous (2) anatropous
 (3) hemi-anatropous (4) campylotropous
124. Dicot pollen grains are generally
 (1) monocolpate (2) bicolpate
 (3) tricolpate (4) multicolpate
125. Pusa Komal, the variety of cowpea is resistant to
 (1) Bacterial blight (2) white rust
 (3) leaf rust (4) leaf curl
126. Triticale is an allopolyploid developed by crosses between
 (1) Wheat and Rye (2) Wheat and Barley
 (3) Barley and Rye (4) Rye and Tobacco
127. Which rice variety has solved food problem in Asia to a great extent?
 (1) IR-36 (2) Dee-geo-woo-gen
 (3) Jaya (4) All of these
128. If a gene at one locus shows lethality by recessive gene and gene at other locus follows law of dominance, then what will be the F₂ phenotypic ratio?
 (1) 6 : 3 : 2 : 1 (2) 3 : 6 : 1 : 2
 (3) 4 : 2 : 2 : 1 (4) 2 : 4 : 2 : 1 : 2 : 1
129. Hybrid of pure red flowered and white flowered pea is crossed to pure red flowered plant. The progeny shall be
 (1) white flowers
 (2) red flowers
 (3) both red and white flowered plant
 (4) mostly red flowered plant

130. According to Denver System G group of chromosomes contain
- (1) 1, 2 & 3 autosomes
 - (2) 6-12 autosomes and X-chromosome
 - (3) 21, 22 autosomes and Y-chromosome
 - (4) 14, 15 & 16 autosomes
131. Free Martin is due to
- (1) sex reversal by gene
 - (2) environmental control of sex
 - (3) hormonal control of sex
 - (4) sex-determination by chromosome
132. In which of the following Lichen is pioneer in succession?
- (1) Hydrosere
 - (2) Psammosere
 - (3) Xerosere
 - (4) Halosere
133. If the frequency of a recessive phenotype in a stable population is 25%. The frequency of the dominant allele in heat population is
- (1) 50%
 - (2) 40%
 - (3) 10%
 - (4) 10%
134. Rape seed (*Brassica napus*) is harmful; to human health due to the presence of
- (1) Lysine
 - (2) Erucic acid
 - (3) Ascorbic acid
 - (4) Tyrosine
135. Rice varieties produced due to mutation is/ are
- (1) Reimei
 - (2) Pelita-1
 - (3) Pelita-2
 - (4) All of these
136. Which of the following is blood cholesterol lowering agent?
- (1) Statin
 - (2) Cyclosporin
 - (3) Bacuolin
 - (4) Erucic acid
137. Which of the following gene controls come borer?
- (1) Cry I Ac
 - (2) Cry I Ab
 - (3) Cry II Ac
 - (4) Cry I Ac and Cry II Ab
138. Which one of the following pair is not correctly matched?
- (1) Spirulina → Single cell protein
 - (2) Rhizobium → biofertilizer
 - (3) Streptomyces → antibiotic
 - (4) Serratia → drug addiction
139. Which of the following is the first transgenic crop?
- (1) Pea
 - (2) Tobacco
 - (3) Flax
 - (4) Cotton
140. *Streptomyces fradiae* produces
- (1) Erythromycin
 - (2) Neomycin
 - (3) Terramycin
 - (4) Aureomycin
141. Tectum baculus, foot layer are the different parts of
- (1) microspore wall
 - (2) microspore mother cell wall
 - (3) megaspore wall
 - (4) megaspore mother cell wall
142. For the formation of tetrasporic embryo-sac, how many megaspore mother cells are required?
- (1) One
 - (2) Two
 - (3) Three
 - (4) Four
143. What is the most effective way to conserve plant diversity of an area?
- (1) Tissue culture
 - (2) Botanical garden
 - (3) Biosphere reserves
 - (4) Seeds banks
144. A bird enters mouth of cocodile and feed on parasitic leeches. The bird gets food and crocodile gets ribs of blood sucking leeches. Both the partners can live independently. Such an association is
- (1) Mutualsim
 - (2) Amensalism
 - (3) Commensalism
 - (4) Protocooperation
145. Rhizophora is a characteristic component of
- (1) Marsh plants
 - (2) Swamp forest
 - (3) Mangroove vegetation
 - (4) Salt swamp
146. In a food chain, the total amount of living material is depicted by
- (1) Pyramid of biomass
 - (2) pyramid of energy
 - (3) Pyramid of number
 - (4) Trophic level
147. Ozone layer in stratosphere is destroyed by or which one of the chemical is responsible for the reduction of ozone content of atmosphere?
- (1) Hydrochloric acid
 - (2) Photochemical smog
 - (3) Chlorofluro carbon
 - (4) Sulphur dioxide
148. Which of the following generally used for induced mutagenesis in crop plants?
- (1) Alpha particle
 - (2) X-rays
 - (3) UV-rays (260 nm)
 - (4) Gamma rays (from cobalt 60)
149. Which of the following is not a hereditary disease
- (1) cretinism
 - (2) cystic fibrosis
 - (3) thalassaemia
 - (4) haemophilia
150. In which of the following plants translating mechanism of pollination occurs?
- (1) Yucca
 - (2) Calotropis
 - (3) Ophrys
 - (4) Salvia

ZOOLOGY

151. Which of the following is incorrectly paired with its function
- (1) Seminiferous tubules - Add fluid containing mucus, fructose and prostaglandins to semen
 - (2) Scrotum - Encases testes and suspends them below abdominal cavity
 - (3) Epididymus - stores sperm
 - (4) Prostate gland - Adds alkaline secretion to semen.
152. Which of the following is least likely to be hermaphrodite?
- (1) Earthworm
 - (2) Barnacle
 - (3) Tapeworm
 - (4) Honeybee
153. Wolfian body is also known as
- (1) Pronephros
 - (2) Mesonephros
 - (3) Metanephros
 - (4) Abnormal heart
154. Acrosome is made up of
- (1) Golgi bodies
 - (2) Mitochondria
 - (3) Ribosomes
 - (4) Centriole
155. Withdrawal of which of the following hormones is the immediate cause of menstruation?
- (1) FSH
 - (2) FSH-RH
 - (3) Estrogen
 - (4) Progesterone
156. Which of the following events is correctly matched with the time period in a normal menstrual cycle
- (1) Release of egg – 5th day
 - (2) Endometrium regenerates – 5-10 days
 - (3) Endometrium secretes nutrients for implantation – 11-18 days
 - (4) Rise in progesterone level – 1-15 days
157. The blastocoel
- (1) Develops into the archenteron or embryonic gut
 - (2) Is a fluid filled cavity in the blastula
 - (3) Opens to the exterior through a blastopore
 - (4) Forms a hollow chamber during gastrulation
158. Which of the following groups does not have eggs with definite polarity?
- (1) Sea urchin
 - (2) Fruit fly
 - (3) Frog
 - (4) Mammals
159. In human females, menstruation can be deferred by administration of
- (1) FSH and LH
 - (2) Estrogen and Progesterone
 - (3) FSH only
 - (4) LH only
160. Neubenkern is part of
- (1) Human ovum
 - (2) Human sperm
 - (3) Foetus
 - (4) Graafian follicle
161. Mesoderm is formed through invagination of
- (1) Ectoderm
 - (2) Endoderm
 - (3) Inner mass of cells
 - (4) Primitive Streak
162. Grey crescent is the area
- (1) at the point of entry of sperm into ovum
 - (2) at the animal pole
 - (3) just opposite the site of entry of sperm into ovum
 - (4) at the vegetal pole
163. Which is not formed by wolffian duct?
- (1) Epididymus
 - (2) vas-deferens
 - (3) Ejaculatory duct
 - (4) Oviduct
164. Chemical found on the surface of ovum which attract the sperm is
- (1) Antifertilizin
 - (2) Fertilizin
 - (3) Agglutinin
 - (4) Hyaluronidase
165. Both corpus lutea and macula lutea are
- (1) Found in human ovaries
 - (2) source of hormones
 - (3) characterised by yellow colours
 - (4) contributory in maintaining pregnancy
166. Monoclonal antibodies
- (1) are produced by mast cells and basophils
 - (2) explain the ability of the immune system to create a larger number of identical T or B cells
 - (3) Are produced in tissue culture by hybridomas
 - (4) are used to treat autoimmune diseases
167. Which one of the following depresses brain activity and produce feeling of calmness, relaxation and drowsiness?
- (1) Hashish
 - (2) morphine
 - (3) Amphetamine
 - (4) valium
168. Which of the following is least likely to result in density dependent effect on the growth of natural population?
- (1) Interspecific competition
 - (2) Parasitism
 - (3) Disease
 - (4) Increased rainfall

169. Heroin is obtained from plant of family?
 (1) Papaveraceae (2) Leguminosae
 (3) Cruciferae (4) Liliaceae
170. Foetal sex can be determined by aminocentesis. This test looks for
 (1) Sex chromosomes in metaphase
 (2) Barr bodies
 (3) Kinetochore (4) Chiasmata
171. The drug "Belladonna" is obtained from
 (1) Rauwolfia (2) Atropa
 (3) Capsicum (4) Solanum
172. Non-sedative drug thalidomide causes phocomelia characterised by the symptoms
 (1) vomiting of female during delivery
 (2) malformed limbs of foetus
 (3) malformed bones of foetus
 (4) all of the above
173. The unit of evolution is now known to be the
 (1) Individual (2) Family
 (3) Population (4) Species
174. The unit of Natural selection is the
 (1) Individual (2) Family
 (3) Population (4) Species
175. The Darwinian fitness of an organism is a measure of
 (1) Its ability, relative to others in the population, to pass its genes to the next generation
 (2) The number of offspring it produces
 (3) Its lifespan
 (4) Its physical vigor
176. Another term for adaptive evolution is
 (1) Clinical change (2) Speciation
 (3) Microevolution (4) Macroevolution
177. Hybrid vigor is often seen in the offspring of two pure bred lines of crop plants (eg. corn). Such vigor is an example of
 (1) Heterozygote advantage
 (2) Extreme diploidy
 (3) Hermaphroditism (4) Recessive superiority
178. Population of Kaibab squirrels on the north rim of the Grand Canyon do not mate with population on the south rim. They are isolated by a
 (1) Sympatric barrier (2) Autopatric barrier
 (3) Geographic barrier (4) Genetic barrier
179. The cultivation of honey bee is called
 (1) Sericulture (2) Laeculture
 (3) Apiculture (4) Silviculture
180. Ranikhet disease is associated with
 (1) Fishes (2) Hens
 (3) Pigs (4) Honey bees
181. Coccidiosis in poultry is caused by
 (1) Virus (2) Protozoa
 (3) Nematode (4) Bacteria
182. Presence of gills in the tadpoles of frog indicates that
 (1) Fishes evolved from frog like ancestors
 (2) Frog will have gills in future
 (3) Frog evolved from gilled ancestors
 (4) Fishes were amphibians in the past
183. Which of the following structure is a solid proof of organic evolution?
 (1) Wings of bird & bats
 (2) jointed legs in arthropods and mammals
 (3) Gill clefts in vertebrate embryos
 (4) Excretory organs of earthworm and cockroach
184. The first organism that came on the earth was
 (1) Aerobes (2) Anaerobes
 (3) Autotrophs (4) Heterotrophs
185. Who is not associated with evolution
 (1) Darwin (2) Morgan
 (3) Lamarck (4) Wallace
186. A deleterious allele decreases more rapidly in frequency if it is
 (1) Recently mutated (2) Rare
 (3) Dominant (4) Recessive
187. A beneficial allele increases more rapidly in frequency if it is
 (1) Recently mutated (2) Rare
 (3) Dominant (4) Recessive
188. Natural selection acts on an organism's
 (1) Dominant alleles
 (2) Recessive, homozygous alleles
 (3) Phenotype (4) Combined genotype
189. Stabilizing selection favours
 (1) Both extreme forms of a trait
 (2) Intermediate forms of a trait
 (3) Environmental differences
 (4) One extreme form over the other extreme form and over intermediate form of a trait

190. Directional selection favours
- (1) Both extreme forms of a trait
 - (2) Intermediate form of a trait
 - (3) Environmental differences
 - (4) One extreme form over the other extreme form and over intermediate form of a trait
191. World's highly prized wool yielding "Pashmina" breed is
- (1) Goat-sheep cross
 - (2) Sheep
 - (3) Goat
 - (4) Kashmir sheep- Afghan, sheep cross
192. Protein present in silk fibre is
- (1) Elastin
 - (2) Casein
 - (3) Fibroin
 - (4) Keratin
193. Isinglass is prepared from
- (1) Air bladder of bony fishes
 - (2) Silica from the earth crust
 - (3) Scales of cartilaginous fishes
 - (4) Shark liver oil
194. Nosema disease is caused by
- (1) Protozoan in the bee
 - (2) Helminth in cattles
 - (3) Bacteria in Poultry
 - (4) Viral in the fishes?
195. Lae is secreted by the
- (1) Adult females & some nymphs
 - (2) Adult male & some nymphs
 - (3) Adult male only
 - (4) Adult females only
196. Silk is formed by
- (1) 75% Fibroin and 25% secicin
 - (2) 50% Fibroin and 50% secicin
 - (3) Only Fibroin
 - (4) Only Secicin
197. Karan Fries is the breed of
- (1) Bee
 - (2) Fish
 - (3) Cow
 - (4) Horse
198. Breed of Buffalo is
- (1) Surti
 - (2) Marwari
 - (3) Nali
 - (4) Manipuri
199. Marine fish is
- (1) Hilsa
 - (2) Catla
 - (3) Tench
 - (4) Rohn
200. Control of mosquito may be done by
- (1) Fumigation
 - (2) Odomos
 - (3) Pyrethrin
 - (4) All of the above

bGbGbGb

ANSWERS

- | | | |
|----------|----------|----------|
| 101. (2) | 141. (1) | 181. (2) |
| 102. (3) | 142. (1) | 182. (3) |
| 103. (4) | 143. (3) | 183. (3) |
| 104. (2) | 144. (4) | 184. (4) |
| 105. (1) | 145. (3) | 185. (2) |
| 106. (2) | 146. (1) | 186. (3) |
| 107. (3) | 147. (3) | 187. (3) |
| 108. (2) | 148. (4) | 188. (3) |
| 109. (4) | 149. (1) | 189. (2) |
| 110. (2) | 150. (2) | 190. (4) |
| 111. (2) | 151. (1) | 191. (3) |
| 112. (4) | 152. (4) | 192. (3) |
| 113. (4) | 153. (2) | 193. (1) |
| 114. (2) | 154. (1) | 194. (1) |
| 115. (2) | 155. (4) | 195. (1) |
| 116. (3) | 156. (2) | 196. (1) |
| 117. (2) | 157. (2) | 197. (3) |
| 118. (1) | 158. (4) | 198. (1) |
| 119. (1) | 159. (2) | 199. (1) |
| 120. (2) | 160. (2) | 200. (4) |
| 121. (2) | 161. (4) | |
| 122. (3) | 162. (3) | |
| 123. (3) | 163. (4) | |
| 124. (3) | 164. (2) | |
| 125. (1) | 165. (3) | |
| 126. (1) | 166. (3) | |
| 127. (1) | 167. (4) | |
| 128. (2) | 168. (4) | |
| 129. (2) | 169. (1) | |
| 130. (3) | 170. (2) | |
| 131. (3) | 171. (2) | |
| 132. (3) | 172. (2) | |
| 133. (1) | 173. (3) | |
| 134. (2) | 174. (1) | |
| 135. (4) | 175. (1) | |
| 136. (1) | 176. (3) | |
| 137. (2) | 177. (1) | |
| 138. (4) | 178. (3) | |
| 139. (2) | 179. (3) | |
| 140. (2) | 180. (2) | |

BOTANY

117. Energy in the form of sunlight is allowed to enter but heat radiation not allowed to leave which results in increase in temperature.

128.
$$\frac{1 : 2}{3 : 1}$$

$$\frac{3 : 6 : 1 : 2}{3 : 6 : 1 : 2}$$

129.
$$\begin{array}{ccc} Rr & \times & RR \\ \square & \square & \downarrow \\ R & R & R \end{array}$$

	R
R	R R Red Flowered
r	R r Red flowered

All red flowered plants

133. $q^2 = 25$

$$q = \sqrt{25} = 5$$

$$q = 0.5$$

$$p = 1 - q = 1 - 0.5 = 0.5$$

137. Protein encoded by the genes Cry I Ac and Cry II Ab controls the cotton bollworms, that of Cry I Ab control corn borer.

138. *Serratia marcescens* is important as a cause of hospital acquired (Nosocomial) infections. it causes urinary & respiratory tract infection.

140. Neomycin has an anti-bacterial action against gram negative bacilli and some gram positive bacteria.

141. Extexine made up of continuous foot layer. A discontinuous baculate (baculium) layer and tectum.

143. Biosphere reserves are mutlipurpose protected area which are meant for preserving genetic diversity in representative ecosystems of various natural biomes and unique biological communities.

145. A few mangrove plants secrete salts from their roots. Some have water storage tissues to dilute salt. e.g. Rhizophora (Red mangrove).

146. The concept of biomass refers to organismal mass or the living material.

147. CFC is strong enemy of ozone and causes depletion of ozone layer.

ZOOLOGY

181. Protozoan Eimeria causes coccidiosis in fowls. It causes bloody diarrhoea.