BOTANY

101. Dominant gene for tallness is T and for yellow colour is Y. A plant heterozygous for both the traits is selfed, then the ratio of pure homozygous dwarf and green offspring would be
(1) 1/4 (2) 4/16
(3) 3/16 (4) 1/16

102. ABO blood grouping in humans is an example of
(1) Polygenic inheritance
(2) Multifactor inheritance
(3) Pleiotropic gene
(4) Multiple alleles

103. The ratio of phenotypes in F_2 of a monohybrid cross is
(1) 3 : 1 (2) 1 : 2 : 1
(3) 9 : 3 : 3 : 1
(4) 1 : 1

104. A man having $R_1R_1R_0R_0$ genotype has 12 feet height, while a man with genotype $r_1r_1r_0r_0$ has 2 feet height. What will be the height of a man having $R_1R_1r_0r_0$ genotype ?
(1) 7 feet (2) 10 feet
(3) 8 feet (4) 12 feet

105. In genetics the test cross means
(1) The crossing of F_1 individual with homozygous recessive parents
(2) Crossing an F_1 individual with either of the two parents
(3) Crossing F_1 individual with another F_1 individual
(4) Crossing F_1 individual with that of F_2

106. The Mendelian principle which has always stood true is
(1) The law of independent assortment
(2) The law of segregation
(3) The law of dominance
(4) All the above

107. A tobacco plant heterozygous for albinism (a recessive character) is self pollinated and 1200 seeds are subsequently germinated. How many seedlings would have the parental genotype
(1) 900 (2) 600
(3) 1200 (4) 300

108. A dwarf pea plant was treated with GA. The plant became tall. The treated plant was then crossed with a homozygous tall pea. The results in F_2 are expected to be
(1) All tall
(2) Tall and dwarf in 3 : 1 ratio
(3) 50% tall (4) All dwarf

109. Genes do not occur in pairs in-
(1) Zygote (2) Somatic cell
(3) Endosperm cell (4) Gametes

110. Blue eye colour in humans is recessive to brown eye colour. The expected children of a marriage between a blue eyed woman and a brown eyed man who had a blue eyeed mother will be
(1) All blue eyed (2) All brown eyed
(3) All black eyed
(4) One blue eyed and one brown eyed

111. The ratio 27 : 9 : 9 : 9 : 3 : 3 : 3 : 1 is
(1) Phenotypic Trihybrid Ratio
(2) Phenotypic Dihybrid Ratio
(3) Genotypic Trihybrid Ratio
(4) Genotypic Dihybrid Ratio

112. If genes A and B show supplementary gene effect for mice coat colour, such that aa is rescessively epistatic to B, what would be the ratio of agouti, black & albino in the cross aaBB × AaBb
(1) 1 : 2 : 1 (2) 1 : 1 : 2
(3) 2 : 2 (4) 4: 3 : 1

113. An organism with two identical alleles is
(1) Dominant (2) Hybrid
(3) Heterozygous (4) Homozygous

114. Female AaBb is crossed to male AAbb. The gametes shall be
(1) Female AB and ab, male AA and bb
(2) Female Aa and Bb, male AA and bb
(3) Female AB, Ab, aB and ab, male Ab
(4) Female AA, bb, AB and ab, male Ab

115. Cob length in maize is an example of
(1) Pleiotropy (2) Polygeny
(3) Multiple Allelism (4) Supplmentary gene

116. If a negro marries a white skin female, the mulattoes are born. If such mulattoes intermarry, progeny will show a grandual gradation of skin colour in ratio of
(1) 1 : 4 : 6 : 4 : 1 (2) 9 : 3 : 3 : 1
(3) 1 : 6 : 15 : 20 : 15 : 6 : 1
(4) 1 : 4 : 6 : 15 : 20 : 15 : 6 : 4 : 1

117. In sickle cell syndrome the aminoacid substituted is
(1) Glutamic acid by valine in α -chain
(2) Valine by glutamic acid in α -chain
(3) Glutamic acid by valine in β -chain
(4) Valine by glutamic in β -chain

118. When chicken on F_1 generation are mated among themselves, they produce an F_2 generation of four kind of birds, as far as comb type and plumage colour are concerned in the following proportion 9 rose comb blacks, 1 single comb white, 3 rose comb whites, 3 single comb blacks. Based on this find out which two are the recessive characters in these birds
(1) Black plumage and white plumage
(2) Single comb and white plumage
(3) Rose comb and single comb
(4) Rose comb and black plumage

119. Normal man without widow peak marries to a woman having widow peak (dominant character) produce a boy child with widow peak which marries to a normal female what is the probability to have a widow peak child in next generation
(1) 100% (2) 50%
(3) 25% (4) 0%

120. Which of the following statement is incorrect ?
(1) Polygenic chracter is controlled by multiple genes
(2) Numerous intermediates are found in between the two extremes in polygenic inheritance
(3) Height, weight and skin colour are polygenic
(4) Polygenic trait is controlled by multiple alleles

121. Which one shows codominance?
(1) Alleles of blood groups A and B
(2) Alleles of normal blood and sickle cell
(3) Alleles for dots and bands in Ladybird Beetle
(4) All the above

122. Phenotypic and genotypic ratio are similar in
(1) Incomplete dominance
(2) Segregation
(3) Independent assortment
(4) Epistasis

123. 9: 3 : 3:1 ratio is due to
(1) Incomplete dominance
(2) Complete dominance
(3) Espistatic genes
(4) Polygenic inheritance

124. A person meet with an accident and great loss of blood has occured. There is not time to analyse his blood groups. It is safe to transfuse blood of
(1) AB, Rh+ (2) AB, Rh^-
(3) O, Rh^- (4) O, Rh+

125. A mother of blood group O has a group O child. The father could be?
(1) A or B or O (2) O only
(3) A or B (4) AB only

126. In a dihybrid cross, F_2 ratio of 15 : 1 is due to
(1) Supplementary genes
(2) Duplicate genes
(3) Recessive epistatsis
(4) Dominant epistasis

127. If an individual of genotype AaBbCcDd is testcrossed, how many different phenotypes can appear in their offpsring?
(1) 3 (2) 6
(3) 8 (4) 16

128. A colour blind man (X^CY) has a colour blind sister (X^CX^C) and a normal Brother (XY). What is the genotype of father & mother
(1) X^CY and XX (2) XY and X^CX
(3) X^CY and X^CX (4) XY and X^CX^C

129. If individuals of genotype AaBbCc are intercrossed, how many different phenotypes can appear in their offspring?
(1) 3 (2) 6
(3) 8 (4) 16

130. What is pleiotropic gene?
(1) Gene with multiple effect
(2) Gene with single effect
(3) Gene without any effect
(4) Multiple gene with single effect

131. If individuals of genotype AaBbCc are intercrossed, how many different genotypes can occur in their progeny?
(1) 6 (2) 8
(3) 16 (4) None of these

132. When F_2 phenotypic ratio is 12 : 3 : 1 this indicate
(1) Dominance
(2) Complementary gene interaction
(3) Dominant epitasis
(4) Allelic interaction

133. The segregation of paired hereditary factors that Mendel postulated occurs during
(1) Anaphase of first meiotic division
(2) Metaphase of second meiotic division
(3) During interphase between two meiotic divisions
(4) Prophase of first meiotic division

134. The minimum progeny population size allowing for random union of all kinds of gametes from AaBbCc parents is
(1) 9 (2) 27
(3) 64 (4) More than 100

135. Who has putforth Mendel's conclusions in the form of laws?
(1) Bateson (2) Correns
(3) Punnet (4) Johanssen

136. In genetics, the use of chequer board was done by
(1) Mendel (2) Correns
(3) Punnet (4) Darwin

137. If in a garden pea plant, a cross is made between pure red flowered and white flowered plants. What will be the phenotypic ratio in F_2 generation
(1) 1 : 2 : 1
(2) 9 : 3 : 3 : 1
(3) 3 : 1
(4) 1 : 3

138. Which genotype represents a true dihybrid condition?
(1) Tt Rr (2) tt rr
(3) Tt rr (4) Tt RR

139. Alleles of different genes that are on the same chromosome may occasionally be separated by a phenomenon known as
(1) Pleotropy (2) Epistasis
(3) Continuous variation (4) Crossing over

140. Mendel did not include in his discoveries
(1) Dominanace (2) Purity of gametes
(3) Linkage (4) Independent Assortment

141. The crossing of a homozygous tall plant with a dwarf would yield plants in the ratio of
(1) Two tall and two dwarf
(2) 3 tall & 1 Dwarf
(3) All homozygous dwarf
(4) All heterozygous tall

142. People who carry an allele for normal haemoglobin and an allele for sickle cell are resistant to malaria they are example of:
(1) Diploidy (2) Outbreeding
(3) Heterozygotic advantage
(4) Recessive superiority

143. The possibility of homozygous progeny in F_2 generation of a monohybrid cross would be
(1) 25% (2) 50%
(3) 75% (4) 100%

144. A man is heterozygous for one autosomal gene pair Dd and he carries a recessive X-linked gene e. What will be the proportion of his sperms with gene pair de?
(1) $\frac{1}{2}$ (2) $\frac{1}{8}$
(3) $\frac{1}{4}$ (4) $\frac{1}{16}$

145. In F_2-generation of dihybrid cross occurence of four types of phenotypes proves
(1) Law of segregation (2) Law of dominance
(3) Law of independent assortment
(4) All the above

146. Hemizygous condition is:
(1) Diploid condition in which both alleles are identical
(2) Condition in which only one allele of a pair is present
(3) Composition of characteristics in terms of alleles
(4) Diploid condition where different alleles are present

147. Which word was designated by Bateson?
(1) Allele (2) Genetics
(3) Homozygons (4) All of these

148. If the dihybrid plant has been crossed with the plant showing recessive characters, the resultant ratio will be
(1) 1 : 1
(2) 9 : 3 : 3 : 1
(3) 1 : 1 : 1 : 1
(4) All plant showing dominant character

149. In which type of cross in F_2-generation progenies will show parent phenotypes in 1 : 1 ratio
(1) Monohybrid cross
(2) Dihybrid cross
(3) Trihybrid cross (4) Test cross

150. How many genotypic categories are obtained in F_2-generation of a dihybrid cross?
(1) Three (2) Nine
(3) Four (4) Eight

ZOOLOGY

151. In Spallanzani's experiment, one set of flasks had access to air through holes in the corks and the other set did not. In the set which had access to air, the contents showed abundant growth of micro-organisms. What inference can be drawn from this experiment?
(1) Spontaneous generation needs contact with air
(2) Spontaneous generation does not need air
(3) In the set of jars which were closed with corks, the contents had not been boiled thoroughly
(4) Air must have got into the jars through the holes in the corks and must have carried the micro-organisms along with it

152. Pasteur succeeded in disproving the spontaneous generation theory, because
(1) He was lucky
(2) He was ingenious in drawing out the necks of the glass flasks so as to provide access to air, but not to the micro-organisms
(3) Of the fact that the sample of yeast taken by him was dead
(4) Of the clean surroundings of his laboratory

153. Stanley Miller conducted experiments on prebiotic earth environment using a special apparatus. The primary products formed in this experiment were
(1) Nucleotides (2) Peptides
(3) Simple sugars (4) Amino acids

154. *Periatus* is a connecting link between
(1) Reptiles and mammals
(2) Molluscs and arthropods
(3) Annelids and arthropods
(4) Annelids and helminths

155. A vestigial organ of man is
(1) Adrenal glands (2) Sebaceous glands
(3) Ear pinnae (4) Wisdom teeth

156. The Theory of Recapitulation means that
(1) All animals start as an egg
(2) Life history of an animal reflects its evolutionary history
(3) Body parts once lost are regenerated
(4) Progeny of an organisms resembles its parents

157. Presence of temporary gill pouches in embryos of snakes, birds and mammals indicates that
(1) These embryos need the pouches for breathing
(2) Common ancestor of these animals had gill pouches
(3) Lungs evolved from gills
(4) Fluid medium in which these embryos develop has abundant O_2

158. Geology and Zoology are intimately connected in
(1) Archaeology (2) Palaeontology
(3) Sociology (4) Zoogeography

159. Which location is most suitable for fossil hunters?
(1) Inside an old active volcano site
(2) Inside a dead volcano site
(3) Sedimentary rocks that had once been lake
(4) Hot sulphur springs

160. In its most widely accepted sense, organic evolution mean, *i.e.,* the "Doctrine of evolution" is particularly concerned with
(1) Descent with modification
(2) Special Creation
(3) Spontaneous growth
(4) Environmental conditions

161. After examining the evidence related to the evolution of haemoglobin, you might conclude that
(1) bird haemoglobin evolved prior to lamprey haemoglobin
(2) frogs are more closely related to lampreys than to birds
(3) evolutionary changes occur at the molecular level
(4) only DNA can be examined for establishing evolutionary differences

162. Which structures provide strong evidence of organic evolution?
(1) Gill clefts in invertebrate embryos
(2) Wings in birds and bats
(3) Jointed legs in arthropods and mammals
(4) Excretory organs in earthworms and frogs

163. Most important evidences of organic evolution are provided by
(1) Occurrence of homologous and vestigial organs in different animals
(2) Occurrence of analogous and vestigial organs in different animals
(3) Occurrence of homologous and analogous organs in different animals
(4) All of these

164. Which set of organs is best to support evolutionary theory
(1) Wings of locusts, pigeon and bat
(2) Wings of bat and birds and forelimbs of horse
(3) Forelimbs of horse, tentacles of hydra and prostomium of earthworm
(4) Wings of pigeon and forelimbs of horse and cockroach

165. Most primitive living mammals which provide an evidence of organic evolution from geographical distribution are found in
(1) China (2) India
(3) Australia (4) Africa

166. Which one represents a connecting link as an evidence from comparative anatomy in favour of organic evolution
(1) Whale between fishes and mammals
(2) *Archaeopteryx* between birds and mammals
(3) Duckbill platypus between reptiles and mammals
(4) Java ape-man between modern man and Peking man

167. Galapagos islands are associated with the name of
(1) Wallace (2) Malthus
(3) Darwin (4) Lamarck

168. According to the theory of evolution, all of the different kinds of homologies-namely, anatomical, molecular, and embryological should
(1) be completely independent of each other
(2) produce similar patterns of evolutionary relatedness
(3) yield very different hierarchical patterns
(4) link all of the species currently present on earth

169. Evolutionary convergence is characterized by
(1) Development of dissimilar characteristics in closely related groups
(2) Development of common set of characteristics in groups of different ancestory
(3) Development of characteristics by random mating
(4) Replacement of common characteristics in different groups

170. Which one is a pair of homologous organs
(1) Wings of grasshopper and crow
(2) Wings of bats and butterflies
(3) Lungs of rabbit and gills of rohu
(4) Arm of monkey and arm of human

171. Most evident evidence of organic evolution is obtained from
(1) Embryos
(2) Fossils
(3) Vestigial organs
(4) Morphological variations

172. Animals that possess homologous structures probably
(1) are headed for extinction
(2) evolved from the same ancestor
(3) have increased genetic diversity
(4) by chance had similar mutations independently in the past

173. Two geographical regions separated by high mountain ranges
(1) Palaearctic and Oriental
(2) Oriental and Australian
(3) Nearctic and Palaearctic
(4) Neotropical and Ethopian

174. Which type of evolution exemplified by wings of mosquito, bat and pigeon?
(1) Convergent
(2) Divergent
(3) Parallel
(4) Co-evolution

175. The flightless bird, Kiwi is found in
(1) Mauritius (2) Indonesia
(3) New Zealand (4) New Guinea

176. The approach to evolution that involves the study of similar structures that appear during the development of different organisms is known as the study of
(1) comparative physiology
(2) embryological homologies (comparative embryology)
(3) biogeography
(4) molecular biology

177. During embryonic development in mammals heart is first 2-chambered as in fishes then 3-chambered as in amphibians and finally becomes 4-chambered. This fact is related with
(1) Mendelism
(2) Hardy-Weinberg's Law
(3) Biogenetic Law
(4) Lamarckism

178. Vestigial organs are

(1) evidence for Lamarck's theory of use and disuse

(2) remnants of structures that were useful to an organism's ancestors

(3) one piece of evidence that does not support the theory of evolution

(4) examples of anatomical imperfections that can only be observed in embryos

179. Which one of these is likely to have been absent in free form at the time of origin of life

(1) Oxygen (2) Hydrogen

(3) Ammonia (4) Methane

180. The water of primitive ocean during the time of "Origin of life", has been called "hot dilute soup of organic substances" by

(1) Haldane (2) Miller

(3) Oparin (4) Sydney Fox

181. As adults, humans have a vestige of a tail. It is called the

(1) lanugo (2) vermiform appendix

(3) Plica semilunaris (4) coccyx

182. According to Wegener continental drift hypothesis before 200 million years ago earth was a large single piece of called

(1) Gondwana (2) Laursia

(3) Pangea (4) Antartica

183. Though whales have lost hairs during their course of evolution but in their development they do develop hairs. This is an example of

(1) Ontogeny repeats phylogeny

(2) Phylogeny repeats phylogeny

(3) Dollo's law

(4) Bergman's rule

184. Cervical fistula is an example of

(1) Atavism (2) Vestigeal organ

(3) Homologous organ (4) Analogous organ

185. Which among the following is a true statement ?

(1) The reducing primitive atmosphere contributed to the origin of life, and the oxidizing one of today would hinder it

(2) The primitive atmosphere was an oxidizing one and today's is a reducing one

(3) The primitive atmosphere had 20% oxygen

(4) Prokaryote evolution took so long because the primitive atmosphere screened out the ultra violet radiations from the sun

186. Evolution of DNA $\rightarrow$ RNA $\rightarrow$ protein system was a milestone because the protocell :

(1) Could now reproduce

(2) Was a heterotrophic fermenter

(3) Needed energy to grow

(4) None of these

187. Which of the following is not an example of a vestigial structure in humans?

(1) Coccyx (2) Pelvis

(3) Appendix (4) Nictitating membrane

188. During their early stages of development, the embryos of reptiles, birds, and mammals look very similar. This suggests that reptiles, birds, and mammals

(1) have a common ancestor

(2) live in the same types of environments

(3) have undergone parallel evolution

(4) are no longer undergoing evolution

189. Which of the following does not apply when discussing the molecular evidence for evolution?

(1) Related organisms share a greater portion of their DNAs

(2) The haemoglobin gene is less similar between humans and dogs than between humans and chimpanzees

(3) Only DNA can be examined for establishing evolutionary differences

(4) None of these

190. Similarity in distantly related groups as an adaptation to some function is called as

(1) Divergent-evolution

(2) Convergent evolution

(3) Parallel evolution

(4) Co-evolution

191. Preservation of finer histological details during fossilization is called

(1) Casting (2) Moulding

(3) Histometabasis

(4) Impression formation

192. Cytochrome oxidase in yeast and human have remarkable similarity. It is an example of

(1) Biochemical evidence

(2) Morphological evidence

(3) Biogeographical evidence

(4) All of these

193. Mesozoic era was golden age of
(1) Fishes (2) Birds
(3) Reptiles (4) Mammals

194. Concept of microsphere was given by
(1) A.T. Oparin (2) Haldane
(3) Sydney Fox (4) Bahadur

195. A thorn of *Bougainvillaea* and a tendril of *Cucurbita* indicate
(1) Homologous structures
(2) Analogous structures
(3) Vestigial structures (4) Rudimentary structure

196. Which of the following sets of structure include all homologous organs?
(1) Wings of bat, pigeon and locust
(2) Nematocyst, trichocyst and sporocyst
(3) Hindlegs of dog, penguin and kangaroo
(4) Nephridium, Malpighian tubules and uriniferous tubules

197. The correct order of the geologic eras, from most ancient to most recent, is .....
(1) Palaeozoic, Coenozoic, Mesozoic, Precambrian
(2) Precambrian, Mesozoic, Coenozoic, Palaeozoic
(3) Precambrian, Palaeozoic, Mesozoic, Coenozoic
(4) Palaeozoic, Mesozoic, Coenozoic, Precambrian

198. The fauna and flora of Australia are very different from those of the rest of the world. Why might this be true?
(1) They have become different by convergent evolution.
(2) The climate of Australia is unlike that of any other place in the world.
(3) Australia was never in close proximity to the other continents.
(4) Australia has been isolated for about 50 million years.

199. All known organisms transcribe genetic information to protein molecules *via* the same genetic code. This finding strongly supports the hypothesis that
(1) there's only one possible way to encode information in a macromolecule
(2) the earliest macromolecules probably arose when lightning struck an oxygen-free atmosphere
(3) all organisms are descended from a single common ancestor
(4) the genetic code will never be broken

200. Evidence from molecular biology supports the theory of evolution by demonstrating that
(1) homologous proteins have arisen independently in many different animal groups
(2) closely related animal species have similar geographic distributions
(3) closely related organisms have more similar DNA and proteins
(4) closely related organisms have different stages of development