125. Intercalated discs are characteristic of muscles found in
(a) heart (b) thigh
(c) urinary bladder (d) stomach.

126. In which of the following sets of organisms, does the external fertilization occur?
(a) Echinodermata and mosses
(b) Hemichordata and ferns
(c) Amphibians and algae
(d) Reptiles and gymnosperms

127. Starting from the maximum, arrange the following male reproductive accessory organs in the correct order, based on the amount of secretion poured into urethra.
(i) Prostrate gland
(ii) Seminal vesicle
(iii) Bulbourethral gland
(a) (i) > (ii) > (iii) (b) (iii) > (ii) > (i)
(c) (ii) > (iii) > (i) (d) (ii) > (i) > (iii)

128. Which of the following contraceptive devices make uterus unsuitable for implantation?
(a) Progestasert (b) CuT
(c) Lippe's loop (d) Multiload

129. In Miller's experiment, he used a mixture of CH_4, NH_3, H_2 and water vapour in a closed flask to mimic early earth conditions. What was the temperature at which this flask was kept?
(a) 800°C (b) 1200°C (c) 200°C (d) 400°C

130. Sexual stage (gametocytes) of *Plasmodium* occurs in
(a) Salivary glands of mosquito
(b) Human RBC
(c) Intestine of mosquito
(d) Human liver

131. Occurrence of triploid (3n) primary endosperm nucleus is a characteristic feature of
(a) Algae (b) Gymnosperms
(c) Angiosperms (d) Bryophytes.

132. From the following groups, select the one which has only secondary metabolites?
(a) Arbrin, cellulose, arginine, tyrosine
(b) Glycine, gums, serine, diterpenes
(c) Carotenoids, phenylalanine, curcumin, rubber
(d) Conclavin-A, morphine, codeine, vinblastin

133. In a diploid cell, at which stage of cell cycle, the amount of DNA is doubled?
(a) G_1 and G_2 phase (b) G_0 phase
(c) S, G_2 and M phase (d) S phase

134. Sporopollenin is a constituent of pollen exine. It can be degraded by the action of
(a) enzymes (b) high temperature
(c) strong acids
(d) cannot be degraded.

135. The pollen grains of rice and wheat lose their viability in ___ minutes of their release.
(a) 30 (b) 10 (c) 60 (d) 90

136. After double fertilization, a mature ovule has
(a) 1 diploid and 1 haploid cell
(b) 1 diploid and 1 triploid cell
(c) 2 haploid and 1 triploid cell
(d) 1 haploid and 1 triploid cell.

137. Genetically modified (GM) crops can be produced by
(a) recombinant DNA technology
(b) somatic hybridization
(c) cross breeding (d) micropropagation.

138. Which of the following is a palindromic sequence?
(a) 5′ - CGTATG - 3′ (b) 5′ - CGAATG - 3′
3′ - GCATAC - 5′ 3′ - CGAATG - 5′
(c) 5′ - GAATTC - 3′ (d) 5′ - GACTAC - 3′
3′ - CTTAAG - 5′ 3′ - TACGAC - 5′

139. C_4 plants have better productivity because
(a) C_4 plants absorb more light
(b) C_4 plants absorb more CO_2
(c) C_4 plants does not carry photorespiration
(d) C_4 plants have more amount of RuBisCO.

140. Match the source gland with its respective hormone and function and select the correct option.

	Source gland	Hormone	Function
(a)	Anterior pitutary	Oxytocin	Contraction of uterine muscles
(b)	Anterior pitutary	Vasopressin	Induces reabsorption of water in nephron
(c)	Thymus	Thymosin	Proliferation of T-lymphocytes
(d)	α-cells of islets of Langerhans	Glucagon	Uptake of glucose into the cell.

9/29

141. Which of the following microbes is correctly paired with its function?
(a) *Aspergillus niger* – Production of lactic acid
(b) *Trichoderma polysporum* – Lowers blood cholesterol
(c) *Saccharomyces cerevisiae* – Production of citric acid
(d) Methanogenic bacteria – Gobar gas formation

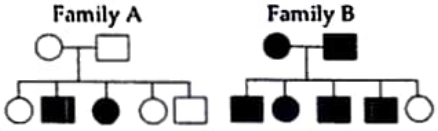
142. Match Column - I with Column - II and select the correct option from the codes given below.

Column - I	Column - II
A. Chlorophyta	(i) *Equisetum*
B. Lycopsida	(ii) *Chara*
C. Phaeophyta	(iii) *Selaginella*
D. Sphenopsida	(iv) *Ectocarpus*

(a) A - (ii), B - (iii), C - (iv), D - (i)
(b) A - (iv), B - (i), C - (ii), D - (iii)
(c) A - (ii), B - (iii), C - (i), D - (iv)
(d) A - (iv), B - (i), C - (iii), D - (ii)

143. Which of the following gastric secretions is correctly matched with its source?
(a) Pepsin – Chief cells
(b) Chymotrypsin – Parietal cells
(c) HCl – Goblet cells
(d) Mucus – Oxyntic cells

144. Which of the following is true for a recessive disease in family A and B?



(a) In family A, both the parents are homozygous recessive.
(b) In family B, both the parents are homozygous dominant.
(c) In family B, both the parents are heterozygous recessive.
(d) In family A, both the parents are heterozygous recessive.

145. Which of the following is true for excretion in humans?
(a) Glucose and amino acids are reabsorbed in PCT by simple diffusion.
(b) DCT is impermeable to water.
(c) On an average, 25-30 gm of urea is excreted out per day.
(d) Maximum reabsorption occurs in the loop of Henle.

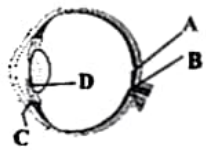
146. Which of the following is not true for inbreeding?
(a) It causes inbreeding depression after a few generations.
(b) It always increases the productivity.
(c) It is used to produce a pure line.
(d) It leads to homozygosity.

147. Which of the following is the correct floral formula for the floral diagram given below?

(a) Br $\oplus \male$ Epi $K_{5 \text{ or } (5)}$ $\overset{\frown}{C_5}$ $A_{(\infty)}$ $\underline{G}_{(2\ \infty)}$
(b) $\oplus \male$ $K_{(5)}$ $\overset{\frown}{C_5}$ $A_{(5)}$ $\underline{G}_{(2)}$
(c) % $\male$ $K_{(5)}C_{1+2+(2)}$ $A_{(9)+1}$ $\underline{G}_1$
(d) $\oplus \male$ $\overset{\frown}{P_{3+3 \text{ or } (3+3)}}$ A_{3+3} $\underline{G}_{(3)}$

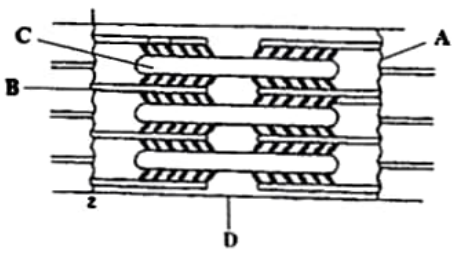
10/29

148. Which of the following is true for the function of labelled parts in the diagram below?



(a) **A** - Blind spot – Image is formed here
(b) **B** - Fovea – No visual activity is present
(c) **C** - Cornea – Helps to hold lens in place
(d) **D** - Iris – Visible coloured portion of eye

149. Which of the following is true for the labelled parts in the figure below?



(a) **A** - Z-line – located at centre of I - band
(b) **B** - Thin filament – occurs in A-band only
(c) **C** - Thick filament – confined to I-band
(d) **D** - H-zone – located at centre of M-line

150. Which of the following is correctly matched without exception in regard to plant classification?
(a) Family – Poaceae - ae
(b) Division – Pteridophyta - phyta
(c) Class – Bryopsida - sida
(d) Genus – *Solanum* - um

151. What is the oxidation state of iron in haemoglobin?
(a) Fe^{-} (b) Fe^{2+}
(c) Fe^{3+} (d) Fe^{4+}

152. In the given table, some organisms are classified into categories. However, there is one exception. Select the option with correctly mentioned exceptional organism.

	Organisms	Category	Exception
(a)	*Penicillium, Aspergillus, Mucor*	Fungi	Mucor
(b)	Cacti, Venus flytrap	Plants	Cacti
(c)	*Ascaris, Neresis, Wuchereria*	Aschelminthes	*Neresis*
(d)	Scorpion, Prawn, *Anopheles*	Arthropoda	Prawn

153. Select the correct pair amongst the following.
(a) Spring wood – light colour, high density
(b) Spring wood – dark colour, low density
(c) Autumn wood – light colour, high density
(d) Autumn wood – dark colour, high density.

154. Which of the following organelles contain DNA?
(i) Mitochondria (ii) Chloroplasts (iii) Golgi bodies (iv) Ribosomes
(a) (i) and (ii)
(b) (ii) and (iii)
(c) (i) only
(d) (iv) only.

155. Carbon dioxide (CO_2) diffuses into blood from tissue site and passes to alveolar site in the form of
(a) bicarbonate; 70%
(b) bicarbonate; 20 – 25%
(c) carbaminohaemoglobin; 60 – 70%
(d) carbaminohaemoglobin; 7%.

156. Select the option having all the correct characteristics.

	Structure	Percentage of WBCs	Function
(a)		0.3 – 0.5	Phagocytic
(b)		0.5 – 1.0	Secrete histamine and serotonin
(c)		30 – 40	Defence against parasites
(d)		30 – 40	Allergic reactions

157. Chromatin is made up of:
(a) DNA and protein
(b) DNA and histone
(c) DNA, RNA, protein
(d) RNA, histone and oil bodies.

158. A large quantity of urban sewage is drained to nearby village river. Which among the given conditions would happen after mixing of sewage into the river?
(i) Biochemical oxygen demand (BOD) of receiving water body increases.
(ii) Dissolved oxygen of receiving water body decreases.
(iii) It will not cause mortality among fishes and other aquatic creatures.
(iv) It will lead to nutrient enrichment of receiving water body.
(a) (i), (ii) and (iii) (b) (i), (ii) and (iv)
(c) (ii) and (iii) (d) (iii) and (iv).

159. Which of the following plant growth regulators (PGRs) promotes root initiation, flowering and induced parthenocarpy?
(a) Gibberellin (b) Auxin
(c) Cytokinin (d) Ethylene.

160. Which of the following is a secondary pollutant?
(a) Carbon dioxide
(b) Nitrogen oxides
(c) Peroxyacyl nitrates
(d) All of these.

Directions : In the following questions (161-180), a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

(a) If both assertion and reason are true and reason is the correct explanation of assertion.
(b) If both assertion and reason are true but reason is not the correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false.

161. Assertion : A mutual exchange of sperms occurs between two earthworms during mating.
Reason : Mature sperms and egg cells and nutritive fluid are deposited in cocoons produced by gland cells of clitellum.

162. Assertion : On plotting the length of the root against time, a linear curve is obtained.
Reason : An elongating root exemplifies arithmetic growth.

163. Assertion : Small intestine is the principal organ for absorption of nutrients.
Reason : Absorption of water, simple sugars and alcohol etc. takes place in small intestine.

164. Assertion : On touching radial artery in our wrist, we feel pulse waves.
Reason : The heart beats originate from the sinoatrial node (SA node) on the right atrium.

165. Assertion : In a regular medical examination of a small population, a 35 years old lady was found to have higher levels of oestrogens, progesterone in her blood.
Reason : The lady is 12 weeks pregnant.

166. Assertion : While working on *Staphylococci*, Alexander Fleming observed that *Penicillium notatum* inhibits the growth of the bacteria.
Reason : This inhibiting chemical was commercially extracted and its full potential was established by Alexander Fleming.

167. Assertion : *Saccharomyces cerevisiae* produces acetic acid.
Reason : *Trichoderma polysporum* produces blood cholestrol lowering agent.

168. Assertion : Protostele is the simplest stele.
Reason : Protostele is the most advanced type of stele.

169. Assertion : Rice field is an ecosystem for plants and animals.
Reason : Gut of human/animals is an ecosystem for flora and fauna.

170. Assertion : Mitochondria and chloroplasts have their own genome.
Reason : Endoplasmic reticulum and Golgi body are the cell organelles which have their own DNA.

171. Assertion : Now-a-days, the biodiversity is declining with an accelerated rate.
Reason : Exotic species are considered to be a major cause of extinction of species.

172. Assertion : Meiosis II is similar to mitosis.
Reason : Meiosis I cannot occur in haploid cells.

173. Assertion : Periodic abstinence is a natural method where couples abstain from coitus
Reason : Coitus from day 5–10 should be avoided because this is the time of ovulation.

174. Assertion : Corpus callosum connects the two cerebral hemispheres.
Reason : Association areas are responsible for complex functions like intersensory association of memory and communication.

175. Assertion : Only a boy child could be born with a substitution of glutamic acid by valine on 6th codon of beta-chain of haemoglobin.
Reason : The gene for the above mutation is found on Y-chromosome.

176. Assertion : The efficiency of C_4 plant is more than those of C_3 plant.
Reason : C_4 plants are more efficient in picking CO_2.

177. Assertion : Cattles feed on leaves of maize to get nutrition for growth and development.