



General Instructions

- (i) The test is of 3 hours and 15 minutes duration.
- (ii) This test paper consists of 180 questions. The maximum marks are 720.
- (iii) Physics and Chemistry contains 45 questions each and Biology (Botany and Zoology) contains 90 questions.
- (iv) Each question carries +4 marks for correct answer and –1 mark for wrong answer.

136. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : In recombinant DNA technology, lysozyme is used for disrupting bacterial cells while cellulase is for plant cells.

Reason R : Isolation of genetic material needs disruption of cells.

In the light of the above statements, choose the *most appropriate* answer from the options given below :

- (A) A is not correct but R is correct
- (B) Both A and R are correct and R is the correct explanation of A
- (C) Both A and R are correct but R is not the correct explanation of A
- (D) A is correct but R is not correct

137. The method of directly injecting a sperm into ovum in assisted reproductive technology is called :

- (A) Embryo transfer (ET)

- (B) Gamete intra fallopian transfer (GIFT)
 - (C) Zygote intra fallopian transfer (ZIFT)
 - (D) Intra cytoplasmic sperm injection (ICSI)
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138. Adaptive radiation in placental mammals and Australian Marsupials leading to similarity between distant species is an example of _____

- (A) genetic drift
 - (B) divergent evolution
 - (C) convergent evolution
 - (D) founder effect
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139. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : In an experiment, Mendel observed that the F1 progeny plants are all tall and none are dwarf.

Reason R : Stem height is a contrasting trait, with tall being dominant and dwarf being recessive.

In the light of the above statements, choose the *most appropriate* answer from the options given below :

- (A) A is not correct but R is correct
 - (B) Both A and R are correct and R is the correct explanation of A
 - (C) Both A and R are correct but R is not the correct explanation of A
 - (D) A is correct but R is not correct
-

140. Arrange the following in descending order of number of species in the Amazonian rain forest.

- (a) Plants
- (b) Birds
- (c) Fishes
- (d) Invertebrates
- (e) Mammals

Choose the correct answer from the options given below :

- (A) (b) > (a) > (d) > (c) > (e)
 - (B) (c) > (b) > (d) > (e) > (a)
 - (C) (d) > (a) > (c) > (b) > (e)
 - (D) (e) > (b) > (a) > (c) > (d)
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141. Sponges exchange O_2 with CO_2 by

- (A) gills
 - (B) simple diffusion over their entire body surfaces
 - (C) moist cuticle
 - (D) tracheal tubes
-

142. For a person with blood group 'O', which of the following is not a possible combination of parents' blood group genotypes ?

- (A) Father : $I^A I^B$ and Mother : $I^A i$
 - (B) Father : $I^A i$ and Mother : $I^B i$
 - (C) Father : $I^A i$ and Mother : $I^A i$
 - (D) Father : $I^B i$ and Mother : $I^B i$
-

143. Given below are two statements :

Statement I : Modern *Homo sapiens* arose in Australia and moved across continents.

Statement II : *Homo sapiens* arose around 75000 to 10000 years ago.

In the light of the above statements, choose the *most appropriate* answer from the options given below :

- (A) Statement I is incorrect but Statement II is correct
 - (B) Both Statement I and Statement II are correct
 - (C) Both Statement I and Statement II are incorrect
 - (D) Statement I is correct but Statement II is incorrect
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144. Which of the following is used as an effective sedative and painkiller for treating post-surgery patients ?

- (A) Anti-retroviral drugs
 - (B) Interferon
 - (C) Antibiotics
 - (D) Morphine
-

145. Which of the following plant produces non-albuminous seeds ?

- (A) Pea
 - (B) Wheat
 - (C) Maize
 - (D) Barley
-

146. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : Abingdon tortoise in Galapagos islands became extinct within a decade after goats were introduced.

Reason R : Goats were more efficient at browsing than Abingdon tortoise.

In the light of the above statements, choose the *most appropriate* answer from the options given below :

- (A) A is not correct but R is correct
 - (B) Both A and R are correct and R is the correct explanation of A
 - (C) Both A and R are correct but R is not the correct explanation of A
 - (D) A is correct but R is not correct
-

147. The covering of ovum at ovulation is

- (A) chorion
- (B) endometrium

- (C) zona radiata
 - (D) zona pellucida
-

148. Which of the following is used as a clot buster ?

- (A) Statins
 - (B) Streptokinase
 - (C) Penicillin
 - (D) Cyclosporin A
-

149. Which of the following structure is not a part of the male reproductive system ?

- (A) Infundibulum
 - (B) Rete testis
 - (C) Epididymis
 - (D) Vasa efferentia
-

150. Given below are two statements :

Statement I : Ovulation is caused by LH surge leading to rupture of Graafian follicles.

Statement II : Graafian follicle remaining after ovulation transform into corpus luteum and secretes large amount of estrogen.

In the light of the above statements, choose the *most appropriate* answer from the options given below :

- (A) Statement I is incorrect but Statement II is correct
 - (B) Both Statement I and Statement II are correct
 - (C) Both Statement I and Statement II are incorrect
 - (D) Statement I is correct but Statement II is incorrect
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151. The opening between the right atrium and the right ventricle is guarded by

- (A) sino-atrial node

- (B) bicuspid valve
 - (C) tricuspid valve
 - (D) semilunar valve
-

152. Which of the following is not evidence for evolution ?

- (A) Divergent evolution of anatomical structures such as forelimbs
 - (B) Convergent evolution of traits like wings of birds and butterflies
 - (C) Paleontological evidence from fossil records
 - (D) Embryological support for evolution as proposed by Ernst Haeckel
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153. The inactive form of Bt toxin is converted to the active form in the insect gut

- (A) by nucleases
 - (B) due to alkaline pH
 - (C) due to acidic pH
 - (D) by proteases
-

154. Colostrum, secreted by mother during initial days of lactation, is abundant in

- (A) IgD
 - (B) IgG
 - (C) IgM
 - (D) IgA
-

155. Which of the following in female gametophyte of an angiosperm helps in guiding the pollen tube for fertilizing the eggs ?

- (A) Polar nucleus
- (B) Antipodals
- (C) Synergids
- (D) Central cells

156. Which of the following disease is not sexually transmitted ?

- (A) Genital warts
 - (B) Syphilis
 - (C) Tuberculosis
 - (D) Gonorrhoea
-

157. Which of the following statements about lac-operon is correct ?

- (A) Galactose can act as an inducer of lac operon
 - (B) Gene i is constitutively expressed
 - (C) Lactose activates repressor to bind to the operator
 - (D) Genes i, z, y and a share single common promoter
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158. Match List-I with List-II.

List-I

List-II

- | | |
|--------------------------|--|
| A. Transformation | I. Restriction enzyme |
| B. Cloning site | II. Transfer DNA to host bacteria |
| C. Selection | III. Replication |
| D. Ori | IV. Antibiotic |

Choose the correct answer from the options given below:

- (A) A-IV, B-I, C-III, D-II
 - (B) A-II, B-I, C-IV, D-III
 - (C) A-I, B-II, C-IV, D-III
 - (D) A-III, B-IV, C-II, D-I
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159. A population of diploid organisms is at Hardy-Weinberg equilibrium. If the frequency of allele A is 0.1, the frequency of AA is _____.

- (A) 0.99
 - (B) 0.01
-

(C) 0.02

(D) 0.10

160. Sperm motility is due to _____.

(A) muscular movement

(B) flagellar movement

(C) ciliary movement

(D) amoeboid movement

161. Consider a population of 10 million cells. Given the per-capita birth rate of 0.002 (per unit time) and the per-capita death rate of 0.002 (per unit time), the expected number of cells after 10 generations is _____.

(A) 100 million

(B) 1 million

(C) 5 million

(D) 10 million

162. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : Forelimbs of human and bats are homologous.

Reason R : Forelimbs of humans and bats have similar anatomical structure.

In the light of the above statements, choose the most appropriate answer from the options given below :

(A) A is false but R is true

(B) Both A and R are correct and R is the correct explanation of A

(C) Both A and R are true, but R is not the correct explanation of A

(D) A is true but R is false

163. Muscle contraction is initiated by a signal sent by the central nervous system by the

release of _____

- (A) cyclic adenine monophosphate
 - (B) acetyl choline
 - (C) acetyl coenzyme A
 - (D) cyclic guanine monophosphate
-

164. Which of the following hormone is not secreted by human placenta ?

- (A) LH
 - (B) hCG
 - (C) Estrogen
 - (D) Progesterone
-

165. Which of the following statements is correct about *Plasmodium* ?

- (A) Fertilization takes place in mosquito gut
 - (B) Reproduces sexually in liver cells
 - (C) Reproduces sexually in RBCs
 - (D) Gametocytes develop in mosquito gut
-

166. Which of the following are primary consumers in a food chain ?

- (A) Carnivores
 - (B) Parasites
 - (C) Predators
 - (D) Herbivores
-

167. Which of the following statements about the reabsorption process in Henle's loop are correct?

- (a) The descending limb of Henle's loop is permeable to water but almost impermeable to electrolytes.

- (b) Urine gets concentrated in Henle's loop.
(c) Reabsorption of Na^+ and water takes place in Henle's loop.
(d) Active or passive transport of electrolytes occurs in the ascending limb of Henle's loop.
Choose the correct answer from the options given below:

- (A) (a), (b) and (d) only
(B) (a) and (b) only
(C) (b), (c) and (d) only
(D) (a), (b) and (c) only
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168. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : The logistic growth model of populations is considered more realistic than the exponential growth model.

Reason R : Resources are finite.

In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) A is not correct but R is correct
(B) Both A and R are correct and R is the correct explanation of A
(C) Both A and R are correct but R is not the correct explanation of A
(D) A is correct but R is not correct
-

169. Which of the following is the correct order of arrangement of vertebrate column from the head to toe?

- (A) Cervical vertebra, thoracic vertebra, lumbar vertebra, sacrum
(B) Cervical vertebra, thoracic vertebra, sacrum, lumbar vertebra
(C) Sacrum, lumbar vertebra, thoracic vertebra, cervical vertebra
(D) Cervical vertebra, lumbar vertebra, thoracic vertebra, sacrum
-

170. Match List-I with List-II.

List-I

- A. Both species are harmed
- B. One species is harmed and the other is benefited
- C. Both species are benefited
- D. One is benefited while the other has no effect

List-II

- I. Predation
- II. Mutualism
- III. Competition
- IV. Commensalism

Choose the correct answer from the options given below:

- (A) A-III, B-I, C-II, D-IV
 - (B) A-III, B-IV, C-II, D-I
 - (C) A-I, B-II, C-III, D-IV
 - (D) A-II, B-I, C-IV, D-III
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171. If the diploid chromosome number of typical angiosperm is 36, what would be the chromosome number in its endosperm ?

- (A) 72
 - (B) 18
 - (C) 36
 - (D) 54
-

172. Which of the following enzymes synthesizes precursor mRNA ?

- (A) DNA polymerase
 - (B) RNA polymerase I
 - (C) RNA polymerase II
 - (D) RNA polymerase III
-

173. Given below are two statements :

Statement I : Plasmids are autonomously replicating DNA.

Statement II : Plasmids are extrachromosomal DNA.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (A) Statement I is incorrect but Statement II is correct
 - (B) Both Statement I and Statement II are correct
 - (C) Both Statement I and Statement II are incorrect
 - (D) Statement I is correct but Statement II is incorrect
-

174. How many theca are present in each lobe of a typical bilobed angiosperm anther ?

- (A) 12
 - (B) 2
 - (C) 6
 - (D) 8
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175. Natural selection can lead to

- (a) stabilisation**
- (b) genetic drift**
- (c) directional change**
- (d) disruption**

Choose the correct answer from the options given below :

- (A) (a) and (c) only
 - (B) (a) only
 - (C) (a), (c) and (d) only
 - (D) (a), (b), (c) and (d)
-

176. Which of the following statements are correct?

- (a) Energy flow from producers to consumers is unidirectional**
- (b) Energy pyramid can never be inverted**
- (c) Transfer of energy follows the 10% law**

Choose the correct answer from the options given below :

- (A) (b) and (c) only
- (B) (a), (b) and (c)
- (C) (a) and (b) only

(D) (a) and (c) only

177. Match List-I with List-II.

List-I

List-II

A. Excess growth hormone

I. Reabsorption of water and electrolytes in kidney

B. Luteinizing hormone

II. Contraction of uterus during child birth

C. Vasopressin

III. Acromegaly

D. Oxytocin

IV. Ovulation

Choose the correct answer from the options given below:

(A) A-IV, B-III, C-I, D-II

(B) A-III, B-IV, C-II, D-I

(C) A-III, B-IV, C-I, D-II

(D) A-II, B-IV, C-I, D-III

178. Which of the following are secondary lymphoid organs?

(a) Bone marrow

(b) Tonsils

(c) Spleen

(d) Thymus

Choose the correct answer from the options given below :

(A) (a) and (d) only

(B) (a) and (b) only

(C) (b) and (c) only

(D) (b) and (d) only

179. During PCR, primers bind to the DNA strands in the _____ step.

(A) ligation

(B) denaturation

(C) extension

(D) annealing

180. Given below are two statements :

Statement I : Down's syndrome is caused by the absence of one of the X-chromosomes.

Statement II : Turner's syndrome is caused by the presence of an additional copy of the chromosomes.

In the light of the above statements, choose the correct answer from the options given below :

(A) Statement I is incorrect but Statement II is correct

(B) Both Statement I and Statement II are correct

(C) Both Statement I and Statement II are incorrect

(D) Statement I is correct but Statement II is incorrect
