

## WBJEE (Medical) 2015

### Solution

#### BIOLOGICAL SCIENCES

##### Category – I (Q1 to Q90)

Each question has one correct option and carries 1 mark, for each wrong answer 1/4 mark will be deducted.

- Vernalization promotes flowering by  
(A) low temperature (B) high temperature  
(C) prolonged photoperiod (D) short photoperiod  
**Solution : (A)**
- C<sub>4</sub> pathway is advantageous over C<sub>3</sub> pathway in plants as it  
(A) occurs in relatively low CO<sub>2</sub> concentration (B) uses more amount of water  
(C) occurs in relatively low O<sub>2</sub> concentration (D) is less efficient in energy utilization  
**Solution : (A)**
- TCA cycle enzymes are located in  
(A) cristae (B) outer membrane  
(C) mitochondrial matrix (D) mitochondrial intermembrane space  
**Solution : (C)**
- Passage cells help in  
(A) transport of water towards pericycle (B) transport of water towards epiblema  
(C) absorption of water from soil (D) passage of CO<sub>2</sub> towards stomata  
**Solution : (A)**
- Medullary rays are tissues made up of  
(A) phloem parenchyma (B) xylem parenchyma (C) sieve tube (D) sclerenchyma  
**Solution : (B)**
- An allosteric inhibitor of the enzyme acts by binding to the  
(A) substrate (B) product  
(C) catalytic site of the enzyme (D) non-catalytic site of the enzyme  
**Solution : (D)**
- During waste water treatment, trickling filter is used for  
(A) primary treatment (B) secondary aerobic treatment  
(C) secondary anaerobic treatment (D) tertiary treatment  
**Solution : (B)**



8. The apoplast is located  
 (A) outside the plasma membrane (B) in the entire cytosol  
 (C) on both sides of plasma membrane (D) in the plastidial content  
**Solution : (A)**
9. The aleurone synthesizes and secretes digestive enzymes that hydrolyze nutrients stored in the endosperm in presence of  
 (A) auxin (B) gibberellin (C) cytokinin (D) ethylene  
**Solution : (B)**
10. ATP synthesis in cell requires  
 (A)  $H^+$  gradient across the membrane (B)  $K^+$  gradient across the membrane  
 (C)  $PO_4^{3-}$  gradient across the membrane (D)  $Ca^{2+}$  gradient across the membrane  
**Solution : (A)**
11. A set of genes will be in a complete linkage when the progeny phenotypes for parental (P) and recombinant (R) types are  
 (A) P = 0%, R = 100% (B) P = 50%, R = 50% (C) P < 50%, R > 50% (D) P = 100%, R = 0%  
**Solution : (D)**
12. Which one of the following statements is **WRONG** in relation to transgenic. Bt cotton plant ?  
 (A) Crop yield loss due to attack by *Bacillus thuringiensis* bacterium is reduced  
 (B) Crop yield loss due to attack by lepidopteran insect pests is reduced  
 (C) The use of chemical insecticides in the cotton field is minimized  
 (D) Better quality cotton is produced  
**Solution : (A)**
13. Which one of the following natural polymers is found both in insects and fungi ?  
 (A) pectin (B) chitin (C) cellulose (D) suberin  
**Solution : (B)**
14. Which one of the following statements is **WRONG** ?  
 (A) Insects have one pair of antennae  
 (B) Millipeds possess two pairs of appendages in each segment of the body  
 (C) Prawns have two pairs of antennae  
 (D) Animals belonging to the phylum Porifera have nematocyst  
**Solution : (D)**
15. Which one of the following is **NOT** a characteristic feature of mammals ?  
 (A) diphyodont tooth (B) ten pairs of cranial nerves  
 (C) seven cervical vertebrae (D) left aortic arch in the circulatory system  
**Solution : (B)**
16. Which one of the following combinations is **WRONG** ?  
 (A) Rio convention – air pollution (B) Kyoto protocol – climate change  
 (C) Montreal protocol – ozone depletion (D) Ramsar convention – wetland conservation  
**Solution : (A)**



17. Which one of the followings is an *in situ* method of biodiversity conservation ?  
(A) national park (B) botanical garden (C) zoological garden (D) scientific laboratory

**Solution : (A)**

18. Nucleosome contains  
(A) only histone protein (B) both DNA and histone protein  
(C) only DNA (D) both DNA and RNA

**Solution : (B)**

19. Which one of the following matching pairs is **WRONG** ?  
(A) Mollusca-Pseudocoel (B) Cnidaria-Nematocyst  
(C) Annelida-Chloragogen cells (D) Echinodermata-Water vascular system

**Solution : (A)**

20. Which one of the following matching pairs is **WRONG** ?  
(A) Shell fish – Pisces (B) Silver fish – Arthropoda  
(C) Cuttle fish – Mollusca (D) Star fish – Echinodermata

**Solution : (A)**

21. Relationship between DO and BOD is that they  
(A) are directly proportional (B) are inversely proportional  
(C) are not related (D) always remain equal to each other

**Solution : (B)**

22. What is the full form of MAB ?  
(A) Man And Biosphere (B) Man And Biosphere Reserve  
(C) Man And Biosphere Reserve Programme (D) Man And Biosphere Programme

**Solution : (D)**

23. The "Red Data Book" records  
(A) species diversity of wetlands (B) list of water pollutants  
(C) list of threatened species (D) rate of population decline

**Solution : (C)**

24. Beta ( $\beta$ ) diversity refers to diversity  
(A) within a community (B) between communities  
(C) between two eco zones (D) within a population

**Solution : (B)**

25. Third stage larva of *Wuchereria bancrofti* carried by *Culex* mosquito is called  
(A) cysticercus (B) merozoite (C) microfilariae (D) trophozoite

**Solution : (C)**

26. Persons suffering from sickle cell anaemia normally **DO NOT** suffer from  
(A) cholera (B) malaria (C) high blood pressure (D) hepatitis

**Solution : (B)**

27. Two related but geographically isolated species are known as  
(A) sibling species (B) sympatric species (C) taxonomic species (D) allopatric species

**Solution : (D)**



28. Which hormone is responsible for reabsorption of water in kidney ?  
(A) ADH (B) STH (C) ACTH (D) GTH  
**Solution : (A)**
29. Wildlife Protection Act India was implemented in the year  
(A) 1982 (B) 1988 (C) 1972 (D) 1970  
**Solution : (C)**
30. The eukaryotic cells have all of the followings **EXCEPT**  
(A) peptidoglycan in the cell wall (B) the 80S ribosome  
(C) nuclear membrane (D) mitochondria  
**Solution : (A)**
31. Which of the followings **DOES NOT** occur in the interphase of eukaryotic cell division ?  
(A) increase of ATP synthesis (B) increase of DNA synthesis  
(C) increase of RNA synthesis (D) reduction in cell size  
**Solution : (D)**
32. Lactose (*Lac*) Operon is regulated by  
(A) Lac repressor only (B) Lac repressor and CAP-cGMP complex  
(C) Lac repressor and CAP-cAMP complex (D) CAP-cAMP and CAP-cGMP complex  
**Solution : (C)**
33. All of the following symptoms are found in jaundice **EXCEPT**  
(A) disorders of hepatobiliary system  
(B) abnormal secretion of pancreatic and gastric juices  
(C) bile duct obstruction  
(D) anaemia  
**Solution : (B)**
34. The hormone that stimulates the release of pancreatic juice is  
(A) secretin (B) glucagon (C) inhibin (D) insulin  
**Solution : (A)**
35. Which one of the following combinations acts as a usual antigen binding site of an antibody ?  
(A) variable regions of a light and another heavy chain  
(B) variable regions of two light chains  
(C) variable regions of two heavy chains  
(D) variable region of a heavy chain and constant region of a light chain  
**Solution : (A)**
36. Which one of the followings acts solely as an inhibitory neurotransmitter ?  
(A) norepinephrine (B) gamma ( $\gamma$ ) amino butyric acid  
(C) acetylcholine (D) dopamine  
**Solution : (B)**
37. Which one of the following antibiotics kills bacterial cells by inhibiting the polymerization of peptidoglycan?  
(A) aminoglycosides (B) fluoroquinolones  
(C) quinines (D) penicillins  
**Solution : (D)**



38. Indicate the **CORRECT** sequence during spermatogenesis.  
 (A) Spermatozoa→spermatogonia→spermatid→spermatocyte  
 (B) Spermatogonia→spermatocyte→spermatid→spermatozoa  
 (C) Spermatid→spermatocyte→spermatozoa→spermatogonia  
 (D) Spermatocyte→spermatozoa→spermatid→spermatogonia  
**Solution : (B)**
39. Which one of the followings is called intra-specific chemical messenger ?  
 (A) pheromones (B) prostaglandins (C) corticotrophin (D) catecholamines  
**Solution : (A)**
40. Which one of the followings is a causative agent of plague ?  
 (A) *Shigella flexneri* (B) *Bordetella pertusis*  
 (C) *Staphylococcus aureus* (D) *Yersinia pestis*  
**Solution : (D)**
41. Which one of the following hormones is responsible for uterine contraction during parturition ?  
 (A) relaxin (B) vasopressin (C) oxytocin (D) prolactin  
**Solution : (C)**
42. Melatonin is produced from  
 (A) pineal gland (B) adrenal gland (C) parathyroid gland (D) ovary  
**Solution : (A)**
43. Elongation of internode is caused by  
 (A) ethylene (B) gibberellin (C) abscisic acid (D) cytokinin  
**Solution : (B)**
44. Endosperm nucleus is  
 (A) n (B) 2n (C) 3n (D) 4n  
**Solution : (C)**
45. Banana is an example of  
 (A) parthenocarpy (B) apomixis (C) parthenogenesis (D) polyembryony  
**Solution : (A)**
46. Stock and scion are used in  
 (A) cutting (B) grafting (C) layering (D) micropropagation  
**Solution : (B)**
47. Nitrogenase enzyme is a  
 (A) magnesium-iron protein (B) molybdenum-iron protein  
 (C) iron-copper protein (D) nickel-iron protein  
**Solution : (B)**
48. necrosis (die-back) of the tip of young leaves is caused due to the deficiency of  
 (A) iron (B) manganese (C) zinc (D) copper  
**Solution : (D)**



49. Guttation is a process of loss of water in  
(A) liquid form containing dissolved minerals (B) liquid form without dissolved minerals  
(C) vapour form with minerals (D) vapour form without minerals  
**Solution : (A)**
50. Egg in female gametophyte is accompanied by  
(A) Antipodal cells (B) Synergids (C) Definitive nucleus (D) Tube nucleus  
**Solution : (B)**
51. Malacophily is the pollination by  
(A) insects (B) birds (C) snails (D) mammals  
**Solution : (C)**
52. Grittiness of pear fruit is caused by  
(A) sclereides (B) raphides  
(C) collenchyma (D) dead parenchyma cells  
**Solution : (A)**
53. Which one of the following organisms is **NOT** used as a biocontrol agent ?  
(A) *Bacillus sphaericus* (B) *Trichoderma viride*  
(C) *Bacillus thuringiensis* (D) *Bacillus subtilis*  
**Solution : (D)**
54. Which one of the followings is **WRONG** for meiosis ?  
(A) It leads to formation of sister chromatids  
(B) It occurs in diploid cell  
(C) It occurs in haploid cell  
(D) It occurs by splitting of centromeres and separation of sister chromatids  
**Solution : (C)**
55. Which one of the following combination of all three fatty acids are essential for human beings ?  
(A) oleic acid, linoleic acid and linolenic acid (B) palmitic acid, linoleic and arachidonic acid  
(C) oleic acid, linoleic acid and arachidonic acid (D) linoleic acid, linolenic acid and arachidonic acid  
**Solution : (D)**
56. Which one of the following information is essential to determine the genetic map distance between two genes located on the same chromosome ?  
(A) length of the particular chromosome  
(B) number of genes present in the particular chromosome  
(C) number of nucleotides in the particular chromosome  
(D) percentage of crossing over or recombinant frequency between the two genes  
**Solution : (D)**
57. Which one of the following is **CORRECT** for blooming of 'short day' plants ?  
(A) The long dark period is not critical  
(B) It is affected by interruption of long dark period by brief exposure of light  
(C) It is not affect by interruption of long dark period by brief exposure of light  
(D) It is affected if the continuous light period is interrupted  
**Solution : (B)**



58. A dicotyledonous plant forms crown gall when  
(A) *Agrobacterium tumefaciens* comes in contact with the plant  
(B) *Agrobacterium rhizogenes* comes in contact with the plant  
(C) a specific part of DNA from the Ti plasmid gets integrated with the plant chromosome  
(D) a specific part of DNA from the Ri plasmid gets integrated with the plant chromosome  
**Solution : (C)**
59. Gene therapy has been successful in curing genetic diseases in laboratory animals through  
(A) exposure to X-ray to rectify the defective gene  
(B) replacing the defective gene with a functional gene  
(C) oral delivery of genes  
(D) use of therapeutic medicines to rectify the defective gene  
**Solution : (B)**
60. What will be the percentage of guanine in a DNA molecule having 20% adenine ?  
(A) 20 %                      (B) 30 %                      (C) 40 %                      (D) 60 %  
**Solution : (B)**
61. Which one of the following group of animals is homeothermic ?  
(A) reptiles                      (B) amphibians                      (C) birds                      (D) fishes  
**Solution : (C)**
62. Neoteny refers to  
(A) development of gonads                      (B) moulting  
(C) metamorphosis                      (D) retention of larval traits in the adult body  
**Solution : (D)**
63. The overlapping zone in between two ecosystems is known as  
(A) ecozone                      (B) biotope                      (C) ecotone                      (D) buffer zone  
**Solution : (C)**
64. The animal species controlling the ecosystem functioning is known as  
(A) edge species                      (B) pioneer species  
(C) keystone species                      (D) umbrella species  
**Solution : (D)**
65. Which one of the following statements is relevant to sex linked characters ?  
(A) They always follow criss-cross inheritance                      (B) They do not follow criss-cross inheritance  
(C) They are mostly present on Y chromosome                      (D) They are only present on X chromosome  
**Solution : (A)**
66. Which one of the following insecticides is of plant origin ?  
(A) Ecdysone                      (B) Rotenone                      (C) Parathion                      (D) Malathion  
**Solution : (B)**
67. The resting state of reptiles in winter is  
(A) hibernation                      (B) aestivation                      (C) diapause                      (D) moulting  
**Solution : (A)**



68. *Archaeopteryx* is a connecting link between  
 (A) pisces and amphibians (B) amphibians and reptiles  
 (C) reptiles and birds (D) birds and mammals  
**Solution : (C)**
69. Phenomenon involving increase in concentration of non-degradable pollutants from lower to higher trophic levels is called  
 (A) biomagnification (B) bioaccumulation (C) biodegradation (D) bioinvasion  
**Solution : (A)**
70. Which one of the following animals is uricotelic ?  
 (A) Lizard (B) Camel (C) Toad (D) Rohu fish  
**Solution : (A)**
71. Zymogenic cells of gastric gland secrete  
 (A) pepsinogen (B) trypsin (C) pepsin (D) chymotrypsin  
**Solution : (A)**
72. During entry into the ovum, acrosome of sperm releases  
 (A) hyaluronidase (B) alkaline phosphatase (C) acid phosphatase (D) carbonic anhydrase  
**Solution : (A)**
73. The epithelium found in the inner linings of stomach and intestine is  
 (A) columnar (B) squamous (C) stratified (D) pseudo-stratified  
**Solution : (A)**
74. The enzyme peptidyl transferase of prokaryotes resides in  
 (A) 50S ribosome (B) 30S ribosome (C) 40S ribosome (D) 60S ribosome  
**Solution : (A)**
75. Which one of the following is **CORRECT** for the transmembrane proteins in lipid bilayer ?  
 (A) They are absent in animal cells (B) They act as channel proteins  
 (C) They are absent in plant cells (D) They are only externally located  
**Solution : (B)**
76. Engulfing of solid materials by cells is called  
 (A) pinocytosis (B) phagocytosis (C) active transport (D) autolysis  
**Solution : (B)**
77. The tRNA anticodon **3'-UAC-5'** will pair with the mRNA codon  
 (A) 5'-AUU-3' (B) 5'-UAC-3' (C) 5'-AUG-3' (D) 3'-GUA-5'  
**Solution : (C)**
78. Peroxisomes have  
 (A) ribosome (B) DNA (C) catalase enzyme (D) centrosome  
**Solution : (C)**
79. Central dogma in molecular biology is  
 (A) RNA → DNA → Protein (B) DNA → RNA → Protein  
 (C) RNA → Protein → DNA (D) DNA → Protein → RNA  
**Solution : (B)**





80. Which one of the followings is the functional unit of hearing ?  
(A) utricle (B) organ of Zuckerkandl (C) organ of Corti (D) vestibular apparatus  
**Solution : (C)**
81. Which one of the followings is **NOT** a refractive medium of the eye ?  
(A) lens (B) vitreous humour (C) aqueous humour (D) pupil  
**Solution : (D)**
82. The heart is covered by  
(A) epicardium (B) pericardium (C) supracardium (D) endocardium  
**Solution : (B)**
83. Which one of the following secretes glucagon ?  
(A) beta ( $\beta$ ) cells of islets of Langerhans (B) alpha ( $\alpha$ ) cells of islets of Langerhans  
(C) acidophilic cells of adenohypophysis (D) basophilic cells of adenohypophysis  
**Solution : (B)**
84. Osteoid refers to  
(A) the smallest bone of the body  
(B) young hyaline matrix of true bone in which calcium salts are deposited  
(C) membranous ossification of cranium  
(D) the largest bone of the body  
**Solution : (B)**
85. The bundle of axons in the central nervous system is known as  
(A) nerve (B) ganglion (C) tract (D) neuron  
**Solution : (C) (Bundle of axons in the CNS is called tract and bundle of axons in the PNS is called nerve)**
86. Which one of the following enzymes is responsible for the conversion of norepinephrine to epinephrine ?  
(A) catecholamine-O-methyltransferase (B) phenylalanine-N-methyltransferase  
(C) DOPA decarboxylase (D) monoamine oxidase  
**Solution : (B)**
87. What is the stroke volume of an adult human heart ?  
(A) 50 ml (B) 70 ml (C) 90 ml (D) 100 ml  
**Solution : (B)**
88. Which one of the following cocci appears like grapes under microscope ?  
(A) streptococci (B) diplococci (C) staphylococci (D) pneumococci  
**Solution : (C)**
89. Which one of the following components of urine in a healthy human **DOES NOT** differ much in concentration from that of blood plasma ?  
(A)  $\text{NH}_4^+$  (B)  $\text{K}^+$  (C)  $\text{Na}^+$  (D)  $\text{SO}_4^{2-}$   
**Solution : (D)**
90. Antibodies produced by a group of identical B-cells against a single epitope of an antigen is called  
(A) polyclonal antibodies (B) monoclonal antibodies  
(C) anti-hapten antibodies (D) somaclonal antibodies  
**Solution : (B)**



**Category – II (Q91 to Q105)**

Each question has one correct option and carries 2 marks, for each wrong answer 1/2 mark will be deducted.

91. Match the items in Column-I with those in Column-II, and choose the **CORRECT** answer.

Column-I	Column-II
P. Mitosis	i. Occurs in diploid cells only
Q. Meiosis	ii. Occurs in both haploid and diploid cells
	iii. Daughter and parent cells have same chromosome numbers
	iv. Synapsis of homologous chromosomes

- (A) P-i, Q-ii (B) P-ii, Q-iii (C) P-iii, Q-iv (D) P-iv, Q-i

**Solution : (C)**

92. A male rabbit of genotype '**AABBDEE**' is crossed with a female rabbit of genotype '**aabbdee**' to produce F<sub>1</sub> hybrid offspring. How many genetically different gametes can be produced by this F<sub>1</sub> hybrid?

- (A) 4 (B) 8 (C) 16 (D) 32

**Solution : (C)**

93. Match Column-I with Column-II.

Column-I	Column-II
P. Cytology	i. Study of fossils
Q. Entomology	ii. Study of cells
R. Palaeontology	iii. Study of birds
S. Ornithology	iv. Study of insects

- (A) P-ii, Q-iii, R-iv, S-i (B) P-ii, Q-iv, R-i, S-iii (C) P-i, Q-ii, R-iv, S-iii (D) P-iii, Q-ii, R-i, S-iv

**Solution : (B)**

94. Genes for maternal inheritance are located in

- (A) golgi bodies (B) mitochondria (C) lysosome (D) nucleolus

**Solution : (B)**

95. Match Column-I with Column-II.

Column-I	Column-II
P. Producer	i. Herbivores
Q. Primary consumer	ii. Green plants
R. Secondary consumer	iii. Saprotrophs
S. Decomposer	iv. Carnivores

- (A) P-i, Q-ii, R-iii, S-iv (B) P-ii, Q-i, R-iv, S-iii (C) P-ii, Q-iv, R-iii, S-i (D) P-iii, Q-ii, R-i, S-iv

**Solution : (B)**

96. Select the **CORRECT** combination of statements regarding Myasthenia gravis.

- (i) It is an autoimmune disorder  
 (ii) It causes insufficient acetylcholine binding that affects muscular contraction  
 (iii) Antibodies are developed against acetylcholine  
 (iv) Antibodies are developed against acetylcholine receptors  
 (v) Antibodies are developed against acetylcholine esterase  
 (vi) it causes drooping of eyelids

- (A) i, iii, iv, vi (B) i, iii, v, vi (C) i, ii, iv, vi (D) ii, iii, iv, v

**Solution : (C)**



97. Each 100 ml of human arterial blood carries 'P' ml of O<sub>2</sub> and 'Q' ml of CO<sub>2</sub> whereas each 100 ml of venous blood carries 'R' ml of O<sub>2</sub> and 'S' ml of CO<sub>2</sub>. Choose the **CORRECT** values of P, Q, R and S.
- (A) P = 48 ml, Q = 19-20 ml, R = 52 ml, S = 14-15 ml  
 (B) P = 19-20 ml, Q = 48 ml ml, R = 14-15 ml, S = 52 ml  
 (C) P = 14-15 ml, Q = 52 ml, R = 19-20 ml, S = 48 ml  
 (D) P = 52 ml, Q = 14-15 ml, R = 48 ml, S = 19-20 ml

**Solution : (B)**

98. Two-membrane envelope is found in
- (A) mitochondria, golgi apparatus and chloroplast  
 (B) mitochondria, nucleus and chloroplast  
 (C) nucleus, golgi apparatus and endoplasmic reticulum  
 (D) nucleus, ribosome and chloroplast

**Solution : (B)**

99. Match the items in Column-I with those in Column-II, and choose the **CORRECT** answer

Column - I	Column-II
P. <i>Thiobacillus</i>	i. Nitrogen fixation
Q. <i>Nitrosomonas</i>	ii. Ammonification
R. <i>Azotobacter</i>	iii. Nitrification
S. <i>Pseudomonas</i>	iv. Denitrification

- (A) P-iv, Q-iii, R-i, S-ii    (B) P-iii, Q-iv, R-i, S-ii    (C) P-iv, Q-ii, R-i, S-iii    (D) P-ii, Q-i, R-iii, S-iv

**Solution : (A)**

100. Match the items in Column-I with those in Column-II, and choose the **CORRECT** answer.

Column-I	Column-II
P. Klinefelter syndrome	(i) Mutation in autosomal gene
Q. Thalassaemia	(ii) Mutation in sex chromosome-linked gene
R. Down syndrome	(iii) Trisomy of autosome
S. Colour blindness	(iv) Trisomy of sex chromosome

- (A) P-(i), Q-(ii), R-(iii), S-(iv)                      (B) P-(ii), Q-(iii), R-(iv), S-(i)  
 (C) P-(iii), Q-(iv), R-(i), S-(ii)                      (D) P-(iv), Q-(i), R-(iii), S-(ii)

**Solution : (D)**

101. An area is declared as "Hot Spot" when
- (A) it has 1500 or more endemic species and 75% of its original habitat is lost  
 (B) it has 1500 or more vertebrate species and 75% of its original habitat is lost  
 (C) it has more than 2000 species of plants  
 (D) most of the species inhabiting the area is facing the risk of extinction

**Solution : (A)**



102. Match Column-I with Column-II.

Column-I	Column-II
P. Vitamin B <sub>1</sub>	(i) Accumulation of fat
Q. Gastric juice	(ii) Loss of fat
R. Starvation	(iii) Pepsin
S. Obesity	(iv) Beriberi

- (A) P-(iii), Q-(iv), R-(ii), S-(i)                      (B) P-(iii), Q-(iv), R-(i), S-(ii)  
 (C) P-(iv), Q-(iii), R-(ii), S-(i)                      (D) P-(iv), Q-(ii), R-(iii), S-(i)

**Solution : (C)**

103. Select **CORRECT** combination of statements for DNA fingerprinting.

- (i) It is ELISA based technique  
 (ii) It is PCR based technique  
 (iii) It is used by forensic scientists  
 (iv) It is based on the fingerprint of the individual  
 (v) It is a test for paternity
- (A) (i), (ii), (iii)                      (B) (ii), (iii), (v)                      (C) (i), (iv), (v)                      (D) (i), (iii), (iv)

**Solution : (B)**

104. Match Column-I with Column-II.

Column-I	Column-II
P. Pollen grains	(i) Photochemical smog
Q. PAN	(ii) Particulate pollution
R. CO <sub>2</sub>	(iii) Global warming
S. Cadmium	(iv) Itai itai disease

- (A) P - (ii), Q - (i), R - (iii), S- (iv)                      (B) P - (iv), Q - (ii), R - (i), S- (iii)  
 (C) P - (i), Q - (ii), R - (iii), S- (iv)                      (D) P - (iii), Q - (i), R - (ii), S- (iv)

**Solution : (A)**

105. Select **CORRECT** combination of statements for Lymph.

- (i) It helps to maintain fluid balance of the body  
 (ii) It is contained in lymphatic vessels and lymphatic organs in mammals.  
 (iii) It is derived from tissue fluid  
 (iv) It contains less antibodies than plasma  
 (v) It flows in both directions  
 (vi) It helps to conserve proteins and remove bacteria
- (A) (i), (ii), (iii), (v)                      (B) (ii), (iii), (iv), (vi)                      (C) (i), (iv), (v), (vi)                      (D) (iii), (iv), (v), (vi)

**Solution : (A)**



**Category – III (Q106 to Q120)**

Each question has one or more correct option(s) choosing which will fetch maximum 2 marks on pro rata basis. However, choice of any wrong option(s) will fetch zero mark for the question.

**106.** Which of the following features is/are **CORRECT** for heterochromatin of eukaryotic nucleus?

- (A) It is highly expanded in interphase (B) It stains densely with basic dyes  
(C) It is highly condensed in interphase (D) It stains densely with acidic dyes

**Solution : (B, C)**

**107.** Which of followings is/are **CORRECT** for the inheritance of genes involved in human 'ABO' blood grouping?

- (A) It is inherited by complete dominant allele  
(B) It is inherited by complete recessive allele  
(C) It is inherited by co-dominant allele  
(D) It is inherited by single gene with more than two allele

**Solution : (A, B, C, D)**

**108.** *Antelop cervicapra* is

- (A) a mammal  
(B) commonly known as black buck  
(C) an animal under data deficient category of wild life  
(D) a threatened Indian wild life

**Solution : (A, B, D)**

**109.** Select the **CORRECT** combination(s) from the followings.

- (A) Encephalitis-viral disease (B) Kala-azar-*Phlebotomus*  
(C) Rhabditiform larvae-*Ascaris* (D) *Entamoeba*- sporogony

**Solution : (A, B, C)**

**110.** Intrinsic and extrinsic pathways of blood clotting are interlinked at the activation steps of which of the following factors?

- (A) factor IX (B) factor IV (C) factor X (D) factor XIIIa

**Solution : (B, C) (Language is not clear)**

**111.** Which of the following pairs of cranial nerves is/are of mixed category?

- (A) glossopharyngeal and hypoglossal (B) trigeminal and abducens  
(C) trigeminal and facial (D) glossopharyngeal and vagus

**Solution : (C, D)**

**112.** Opening and closing of stomata is controlled by

- (A) abscisic acid (B) CO<sub>2</sub> concentration (C) O<sub>2</sub> concentration (D) light intensity

**Solution : (A, B, D)**

**113.** Which of these gases was/were present in prebiotic atmosphere?

- (A) ammonia (B) methane (C) oxygen (D) hydrogen

**Solution : (A, B, D)**



114. Which of these components is/are **NOT** present in Gram-negative bacteria?  
(A) teichoic acid (B) pseudomurein (C) lipopolysaccharide (D) mycolic acid

**Solution : (A, B, D)**

115. The usual cause(s) of peptic ulceration is/are  
(A) lower rate of secretion of gastric juice  
(B) higher rate of secretion of gastric and duodenal juices  
(C) improper neutralization of gastric juice by duodenal juices  
(D) imbalance between the rate of secretion of gastric juice and the degree of protection offered by gastro-duodenal mucosa

**Solution : (B, C, D) (For option B suitable point is Zollinger Ellision Syndrome which not mentioned here).**

116. Which of the following statements is/are **CORRECT** regarding the effects of pH on enzyme catalysed reactions?  
(A) Direction of the reaction is influenced by  $[H^+]$   
(B) Ionization state of dissociating groups on the enzyme is modified  
(C) Ionization state of the substrate is modified.  
(D) Protein is not denatured with the change in pH

**Solution : (A, B, C) (Activity of the enzyme mainly related to the degree of dissociation to the electric charge of the enzyme and through this, to the formation of the enzyme – substrate complex).**

117. Which of the following statements is/are **CORRECT** for transduction?  
(A) It is observed in Gram positive and Gram negative bacteria  
(B) Bacteria should be in state of competence  
(C) Transfer of DNA by a bacteriophage takes place  
(D) Packaging of both host and phage DNA takes place

**Solution : (A, C, D)**

118. Select the **CORRECT** statement(s) pertaining to Chipko movement.  
(A) It was led by Sunderlal Bahuguna  
(B) It was a tree hugging movement  
(C) It commenced in the Tehri-Garhwal district  
(D) It received global attention on environmental protection

**Solution : (A, B, C, D)**

119. Select the **CORRECT** combination(s) from the followings.  
(A) Gir-Asiatic Lion (B) Sunderbans-Rhinoceros  
(C) Periyar-Indian Elephant (D) Corbet National Park-Red Panda

**Solution : (A, C)**

120. Select the non-degradable pollutant(s) from the followings.  
(A) plastic (B) organochlorine pesticides  
(C) heavy metals (D) domestic sewage

**Solution : (A, B, C)**

**END OF QUESTION PAPER**

