

WBJEEM - 2016

Answer Keys by
Aakash Institute, Kolkata Centre

BIOLOGY

Q.No.				
01	A	C	D	B
02	B	D	B	B
03	C	B	C	B
04	A	B	A	A
05	C	D	D	B
06	C	B, D	C	B
07	C	A, D	C	C
08	B	D	A	D
09	C	C	A	C
10	B	A	A	C
11	B	B	C	B
12	C	B	B	C
13	D	C	D	C
14	D	A	D	C
15	A	A	B	A
16	C	D	B	B
17	A	B	B	C
18	A	C	B	D
19	D	A	B	B
20	C	D	C	C
21	B	C	D	D
22	B	C	C	B, D
23	B	D	D	A, D
24	B	A	C	C
25	A	A	A	A
26	B	C	D	A
27	B	B	D	B
28	C	B	D	B
29	D	D	D	C
30	C	B	D	C
31	C	B	B	A
32	A	B	A	D
33	C	C	A	B
34	C	B	B	C
35	C	C	C	A
36	B	D	B	D
37	B	D	C	C
38	C	D	C	B
39	D	C	C	D
40	D	A	C	A
41	C	B	D	A
42	D	D	D	C
43	B, D	D	A	B
44	A, D	D	B	B
45	C	D	B	D
46	A	C	C	B
47	A	A	D	B
48	B	A	C	D
49	B	B	C	C
50	B	C	A	B
51	C	B	A	C
52	A	C	B	A
53	D	C	A	D
54	C	C	B	D
55	C	C	B	C
56	A	D	B	D
57	D	D	B	B
58	C	A	C	D
59	B	B	C	D
60	D	B	C	D
61	A	A	C	B
62	A	D	D	C
63	B	C	C	A
64	B	C	A	A
65	B	A	C	C
66	D	B	C	C
67	B	B	D	B
68	C	A	B	C
69	D	B	B	C
70	C	B	C	B
71	B	B	B, D	C
72	C	D	A, D	D
73	A	C	D	D
74	D	C	C	A
75	D	B	D	B
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82	C	A	C	D
83	A	D	A	C
84	A	D	C	D
85	B	B	B	B
86	C	C	D	C
87	A	B	C	B
88	C	A	B	B
89	B	B	D	C
90	D	B	B	A
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92	D	A	D	D
93	B	A	D	A
94	C	B	B	C
95	D	C	C	B
96	B	A	B	D
97	C	B	A	B
98	A	C	C	B
99	D	D	B	C
100	B	C	D	A
101	A	B	A	B
102	C	B	A	B
103	B	C	B	C
104	D	B	C	A
105	B	D	A	B
106	B	A, C	B, C	B, C
107	A, D	B, D	C	A, C, D
108	B, C	A, B	A, B, C	A, D
109	C	A, C, D	B, D	B
110	A, B, C	B, C	A, B	C
111	B, D	B	A, C	A, B, C
112	A, B	A, D	B, C	B, C
113	A, C	A, B, C	A, C, D	A, B
114	A, C, D	B, C	A, D	A, C
115	B, C	C	B	B, D



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ANSWERS & HINT for WBJEEM - 2016 SUB : BIOLOGY

CATEGORY - I (Q1 to Q80)

Only one answer is correct. Correct answer will fetch full marks 1. Incorrect answer or any combination of more than one answer will fetch – ¼ marks.

- Nucleosome core is intimately associated with :
(A) 160 bp of DNA (B) 210 bp of DNA (C) 250 bp of DNA (D) 100 bp of DNA
Ans : (A)
Hint : The nucleosome core particles is intimately associated with 160 bp of DNA approximately.
- Histone proteins are rich in :
(A) Alanine and glycine (B) Arginine and lysine (C) Histidine and serine (D) Tyrosine and cysteine
Ans : (B)
Hint : Histone proteins are rich in Arginine and Lysine (Basic amino acids)
- Companion cells are associated with :
(A) Axial parenchyma (B) Ray parenchyma (C) Sieve tubes (D) Sieve cells
Ans : (C)
Hint : Companion cells are associated with the sieve tube (of phloem) in Angiosperms.
- 'Peroxisome' is the microbody of a cell that helps in :
(A) Removal of electron and associated hydrogen (B) Removal of proton
(C) Conversion of carbohydrate into fat (D) Conversion of carbohydrate into protein
Ans : (A)
Hint : 'Peroxisome' is a microbody of a cell that help in removal of electron and associated hydrogen by oxidase enzyme.
- In metamale *Drosophila*, chromosome combination is :
(A) 3X : 2A (B) 3X : 3A (C) XY : 3A (D) XY : 2A
Ans : (C)
Hint : According to Genic balance theory (by C.B. Bridges), X/A ratio < 0.5 is responsible for Metamale or super male in *Drosophila*.
- Which one is sex-linked disease in man ?
(A) Polio (B) Alzheimer's disease (C) Hemophilia (D) Beriberi
Ans : (C)
Hint : Hemophilia (recessive X-linked disorder)

7. Initiation of DNA strand synthesis is performed by :

- (A) DNA polymerase I (B) DNA Helicase (C) DNA Primase (D) DNA Topoisomerase

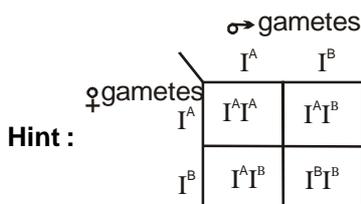
Ans : (C)

Hint : DNA primase is a type of RNA polymerase which creates a RNA primer to initiate DNA replication.

8. Marriage between persons having AB blood groups would produce :

- (A) Offsprings with AB blood group only (B) Offsprings with A, B and AB blood groups
(C) Offsprings with A and B blood groups only (D) Offsprings with A, B, AB and O blood groups

Ans : (B)



9. Test cross involves

- (A) Cross between two F_1 progenies
(B) Crossing F_1 progeny with double recessive parental progeny
(C) Crossing genotypes with recessive traits
(D) Crossing two genotypes with dominant trait

Ans : (C)

Hint : Test cross involves crossing individual of dominant phenotype having unknown genotype with a recessive parent.

10. In which stage of meiosis homologous chromosomes are segregated ?

- (A) Metaphase I (B) Anaphase I (C) Anaphase II (D) Metaphase II

Ans : (B)

Hint : Homologous chromosomes segregate during Anaphase-I

11. Seed dormancy can be broken by :

- (A) ABA and GA_3 (B) GA_3 and ethylene (C) IAA and ABA (D) ABA and IPA

Ans : (B)

Hint : Seed dormancy can be broken by GA_3 and Ethylene.

12. Plants which disregard the requirement of a definite day length for the following are called :

- (A) Short day plants (B) Long day plants (C) Day neutral plants (D) Long short-day plants

Ans : (C)

Hint : Day neutral plants – flowering in plants is not affected due to variation in photoperiod (Day length and night length)

13. Which of the following is a potent weedicide ?

- (A) IPA (B) TIBA (C) BAP (D) 2, 4-D

Ans : (D)

Hint : 2, 4 –D acts as selective weedicide.

14. Conversion of nitrate to ammonia is a/an :

- (A) Amination process (B) Deamination process (C) Oxidative process (D) Reductive process

Ans : (D)

Hint : Conversion of Nitrate to Ammonia is a reductive process.

15. Kupffer cell is present in :
 (A) Liver (B) Pancreas (C) Kidney (D) Intestine
Ans : (A)
Hint : Kupffer cells are phagocytic cells of liver.
16. The movement of solvent molecules into the region of higher solute concentration through semipermeable membrane is called :
 (A) Imbibition (B) Diffusion (C) Osmosis (D) Plasmolysis
Ans : (C)
Hint : Movement of solvent molecules into the region of higher solute concentration through semi-permeable membrane is called osmosis.
17. Turgor pressure of a plant cell increases due to :
 (A) Endosmosis (B) Exosmosis
 (C) Wall pressure (D) Diffusion pressure deficit
Ans : (A)
Hint : Turgor pressure of a plant cell increases due to endosmosis (it is entry of water inside the cell)
18. The empirical formula of 'chlorophyll a' is :
 (A) $C_{55}H_{72}O_5N_4Mg$ (B) $C_{55}H_{70}O_6N_4Mg$ (C) $C_{55}H_{72}O_5N_4Fe$ (D) $C_{55}H_{72}O_4N_5Mg$
Ans : (A)
Hint : Chlorophyll a – $C_{55}H_{72}O_5N_4Mg$
19. Vernalization is the effect of low temperature on :
 (A) Delaying of flowering (B) Inhibition of flowering
 (C) Acceleration of fruit ripening (D) Acceleration of flowering
Ans : (D)
Hint : Vernalization is the effect of low temperature on acceleration of flowering.
20. Stomata remain open at night in :
 (A) C_3 plants (B) C_4 plants (C) CAM plants (D) Hydrophytic plants
Ans : (C)
Hint : Stomata remain open at night in CAM plants (Scotoactive stomata - for conservation of water by reducing transpiration).
21. Incipient plasmolysis is :
 (A) Last stage of plasmolysis (B) Mid stage of plasmolysis
 (C) Zero hour for inception of plasmolysis (D) Initial stage of plasmolysis
Ans : (B)
Hint : Plasmolysis takes place in 3 stages :
 (a) Limiting plasmolysis (1st stage)
 (b) Incipient plasmolysis (Mid stage)
 (c) Evident plasmolysis (Last stage)
22. Which of the following forms of soil-water is commonly absorbed by plants ?
 (A) Hygroscopic water (B) Capillary water (C) Gravitational water (D) Free water
Ans : (B)
Hint : Commonly capillary water is available to plant for absorption.
23. In plant 'transpiration pull' theory for ascent of sap was first proposed by :
 (A) Dixon (B) Dixon and Jolly (C) J. C. Bose (D) Strasburger
Ans : (B)
Hint : Most accepted theory for Ascent of Sap is Transpirational Pull theory by Dixon and Jolly.

24. In plants opening of stomata is regulated by :
(A) Red light (B) Blue light (C) Far-red light (D) Ultraviolet light
Ans : (B)
Hint : Blue light is most effective for stomatal opening.
25. The enzyme nitrogenase is extremely sensitive to :
(A) Oxygen (B) Nitrogen (C) Hydrogen (D) Helium
Ans : (A)
Hint : Oxygen degrades *Nitrogenase* enzyme.
26. Pollination which occurs in closed condition of flowers is called :
(A) Allogamy (B) Cleistogamy (C) Protandry (D) Protogyny
Ans : (B)
Hint : These flowers never open in its life time.
27. Photorespiratory reactions are operated in :
(A) Chloroplasts, ribosomes and peroxisomes (B) Chloroplasts, mitochondria and peroxisomes
(C) Mitochondria, peroxisomes and lysosomes (D) Mitochondria, chloroplasts and ribosomes
Ans : (B)
Hint : Chloroplast, Peroxysome and Mitochondria are involved in Photorespiration.
28. Which of the following can fix nitrogen in nonleguminous plants ?
(A) *Rhodospirillum* (B) *Azotobacter* (C) *Frankia* (D) *Rhizobium*
Ans : (C)
Hint : In root nodules of non-leguminous plants
29. In the muscles carbohydrates are stored in the form of :
(A) Glycolipid (B) Cellulose (C) Starch (D) Glycogen
Ans : (D)
Hint : Glycogen, a polysaccharide, is the storage carbohydrate of muscles.
30. Cerebrum is a part of :
(A) Mesencephalon (B) Metencephalon (C) Prosencephalon (D) Myelencephalon
Ans : (C)
Hint : Cerebrum is the part of fore-brain, which develops from embryonic prosencephalon.
31. Which of the following metabolites enter the TCA cycle during glucose oxidation ?
(A) Oxaloacetic acid (B) Pyruvic acid (C) Acetyl CoA (D) Malic acid
Ans : (C)
Hint : Acetyl CoA, the product of link reaction enters TCA cycle.
32. The adrenal cortex synthesizes only :
(A) Steroid hormones (B) Peptide hormones (C) Glycopeptide hormones (D) Catecholamines
Ans : (A)
Hint : All hormones of adrenal cortex are steroid in nature and are derived from cholesterol.
33. Oxytocin is synthesized in
(A) Adenohypophysis (B) Neurohypophysis (C) Hypothalamas (D) Epiphysis
Ans : (C)
Hint : Oxytocin is synthesized by hypothalamic nuclei and is stored and secreted by neurohypophysis.

34. CO₂ is carried in blood by hemoglobin in the form of :

- (A) Sodium bicarbonate (B) Potassium bicarbonate (C) Carbamino compound (D) Methaemoglobin

Ans : (C)

Hint : About 23% of CO₂ is carried in form of carbamino compound by binding with globin protein of haemoglobin.

35. Which white blood cell releases chemical to inhibit blood clotting ?

- (A) Monocyte (B) Eosinophil (C) Basophil (D) Neutrophil

Ans : (C)

Hint : Basophil releases 3 chemicals - Histamine, Serotonin and Heparin. Out of which Heparin acts as an anticoagulant and prevents blood clotting.

36. Which cell in the retina recognize colour ?

- (A) Rod cells (B) Cone cells (C) Both Rod and Cone cells (D) Epithelial cells

Ans : (B)

Hint : Cone cells of retina are related to Photopic vision and also for perception of colours.

37. Trypsinogen is activated by :

- (A) HCl (B) Enterokinase (C) Bile (D) Chymotrypsin

Ans : (B)

Hint : Enterokinase of intestinal juice converts inactive Trypsinogen into active Trypsin.

38. Acetylcholine is a :

- (A) Hormone (B) Brain peptide (C) Neurotransmitter (D) Digestive enzyme

Ans : (C)

Hint : Acetylcholine is a neurotransmitter released by Synaptic vesicles of Pre-synaptic fibre.

39. Fatty substances are emulsified by :

- (A) Lipase enzyme (B) Bilirubin and biliverdin
(C) HCl (D) Sodium salts of glycocholic and taurocholic acids

Ans : (D)

Hint : Fatty substance are emulsified by bile salts secreted by liver.

40. Vagus nerve is a :

- (A) Vth cranial nerve (B) VIth cranial nerve (C) IXth cranial nerve (D) Xth cranial nerve

Ans : (D)

Hint : Vagus nerve is a Xth Cranial nerve which is mixed in nature.

41. In human, fertilization usually occurs at:

- (A) Vagina (B) Cervix (C) Fallopian tube (D) Oviduct

Ans : (C)

Hint : In human, fertilization normally occurs in fallopian tube.(ampulla-isthmic junction)

42. Which of the following hormone is not chemically glycoprotein ?

- (A) Growth hormone (B) Prolactin (C) Luteinizing hormone (D) Estrogen

Ans : (D)

Hint : Estrogen is a steroid hormone.

43. Release of pancreatic juice is stimulated by :

- (A) Enterokinase (B) Secretin (C) Trypsinogen (D) Cholecystokinin

Ans : (B,D)

Hint : Both cholecystokinin and secretin stimulate the secretion of Pancreatic Juice.

44. Which one of the following cranial nerves is a parasympathetic nerve ?
 (A) Facial (B) Auditory (C) Abducens (D) Vagus

Ans : (A,D)

Hint : Parasympathetic nervous system includes four cranial nerves - III [Oculomotor] VII [Facial], IX [Glossopharyngeal] and X [Vagus]

45. Which one of the following is not related with bone disorder ?
 (A) Arthritis (B) Osteoporosis (C) Atherosclerosis (D) Ricket

Ans : (C)

Hint : Atherosclerosis is a vascular disease, due to deposition of cholesterol in the tunica intima of arteries.

46. Where is Brunner's gland located ?
 (A) Submucosa of duodenum (B) Submucosa of stomach
 (C) Mucosa of oesophagus (D) Mucosa of ileum

Ans : (A)

Hint : Brunner's glands are located in the sub-mucosa of duodenum.

47. Ecotone is :
 (A) A zone between two ecosystems (B) An ecological study
 (C) Vertical zonation of an ecosystem (D) Horizontal zonation of an ecosystem

Ans : (A)

Hint : Ecotone is a transition zone between two ecosystems.

48. Which one of the following is an example of *ex situ* conservation ?
 (A) Wild life sanctuary (B) Seed bank (C) Sacred groves (D) National Park

Ans : (B)

Hint : Seed bank is an example of *ex-situ* (off-site) means of conservation.

49. The fovea of eye
 (A) has the lowest light threshold (B) is the region of highest visual activity
 (C) contains only green and red cones (D) contains only rods

Ans : (B)

Hint : Fovea is the central part of yellow spot of eye and is the region of highest visual acuity and it contains only cones.

50. Chipko movement is concerned with :
 (A) Conservation of water resources (B) Conservation of forest
 (C) Conservation of tiger (D) Conservation of biodiversity

Ans : (B)

Hint : Chipko Movement is concerned with forest conservation and was initiated by Sunder Lal Bahuguna at Garhwal (Uttarakhand)

51. Which one of the following features is common to Earthworm, Butterfly, Spider and Prawn ?
 (A) Setae (B) Antenae (C) Ventral nerve cord (D) Nephridia

Ans : (C)

Hint : Presence of ventral nerve cord is a typical non-chordate character.

52. Phenetic classification of organisms is based on :
 (A) Observable characteristics of existing organisms
 (B) The ancestral lineage of existing organisms
 (C) Dendrogram based on DNA characteristics
 (D) Sexual characteristics

Ans : (A)

Hint : Phenetics is another name for Numerical Taxonomy based on morphology or other observable trait regardless of their phylogeny.

53. Parathion is a pesticide. In which one of the following categories it belongs ?

- (A) Organochlorine (B) Synthetic pyrethroids (C) Carbamate (D) Organophosphate

Ans : (D)

Hint : Parathion is a type of organophosphate

54. Phenomenon involved in increasing the concentration of non-degradable pollutants in a trophic level of an ecosystem is called :

- (A) Biodegradation (B) Biomineralization (C) Bioaccumulation (D) Biomagnification

Ans : (C)

Hint : Bioaccumulation involves increase in concentration of non-degradable pollutant in a trophic level.

55. 'Ozone layer' is located in :

- (A) Troposphere (B) Hydrosphere (C) Stratosphere (D) Lithosphere

Ans : (C)

Hint : Ozone layer is found in stratosphere.

56. Which one of the following combination is wrong ?

- (A) Ramsar Convention – Air pollution
 (B) Kyoto Protocol – Climate change
 (C) Montreal Protocol – Ozone depletion
 (D) Rio Convention – Sustainable development

Ans : (A)

Hint : Ramsar convention is related to wetland conservation.

57. Tautonym is :

- (A) Unscientific explanation of a phenomenon
 (B) Common name used as scientific name
 (C) Non-latinised name
 (D) Same name for genus and species

Ans : (D)

Hint : Tautonym is same name for Genus and species. e.g. *Naja naja*

58. Which antibody is first to be released into blood following an infection ?

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

Ans : (C)

Hint : IgM is the antibody of primary response.

59. The uptake of naked DNA by bacteria is called :

- (A) Conjugation (B) Transformation (C) Transfection (D) Transduction

Ans : (B)

Hint : Transformation is the uptake of DNA by bacteria from solution.

60. Which one of the followings is an oncogenic virus ?

- (A) *Human immunodeficiency virus type 2* (B) *Vesicular stomatitis Indiana virus*
 (C) *Human herpesvirus 3* (D) *Epstein-Barr virus*

Ans : (D)

Hint : Epstein-Barr Virus [EBV], also called Human herpes virus -4, is associated with cancers, such as Hodgkin's lymphoma, Burkitt's lymphoma. Nasopharyngeal carcinoma and gastric cancer.

61. The genome of Influenza virus is a :

- (A) Single-stranded RNA(-) (B) Single-stranded RNA(+)
(C) Double-stranded RNA (D) Single-stranded DNA

Ans : (A)

Hint : The genome of Influenza virus is single stranded RNA(-) . It is called negative sense RNA because it has opposite polarity of mRNA that is translated to make proteins.

62. An immunoglobulin G molecule is composed of :

- (A) two identical heavy chains and two identical light chains
(B) two identical heavy chains and two different light chains
(C) two different heavy chains and two identical light chains
(D) two different heavy chains and two different light chains

Ans : (A)

Hint : IgG molecule is composed of two identical heavy chains and two identical light chains.

63. Which of the following diseases is caused by virus and transmitted by mosquito?

- (A) Typhus (B) Yellow fever (C) Plague (D) Filariasis

Ans : (B)

Hint : Yellow fever is caused by RNA containing Flavi-virus which is transmitted by female tiger mosquito (*Aedes aegypti*)

64. Bacterial resistance to antibiotics is a genetic trait, it is normally carried by the :

- (A) Centromere (B) Plasmid (C) Chromosome (D) Intron

Ans : (B)

Hint : Bacterial resistance to antibiotics is a genetic trait, it is normally carried by the plasmid

65. The DNA-joining enzyme, required in recombinant DNA technology, is :

- (A) Transcriptase (B) DNA ligase (C) DNA helicase (D) DNA polymerase

Ans : (B)

Hint : DNA ligase is DNA joining enzyme, used in recombinant DNA technology and also called 'Molecular glue'. It joins DNA fragments by forming phosphodiester bond.

66. Who discovered the small-pox vaccine?

- (A) Louis Pasteur (B) Selman Waksman (C) Cesar Milstein (D) Edward Jenner

Ans : (D)

Hint : Edward Jenner discovered small pox vaccine in 1796.

67. Viral genome incorporated into host DNA is called :

- (A) Prophase (B) Prophage (C) Bacteriophage (D) None of these

Ans : (B)

Hint : Viral genome incorporated into host DNA is called prophage.

68. In which of the following phase DNA / chromosome replication takes place?

- (A) G₁-phase (B) G₂-phase (C) S-phase (D) Prophase

Ans : (C)

Hint : DNA / chromosome replication occurs in S-phase of interphase.

69. Cells of certain species of animals have six pairs of chromosomes. How many molecules of DNA will remain in a nucleus of these animals during G₂ phase?

- (A) 12 (B) 48 (C) 6 (D) 24

Ans : (D)

Hint : G₁ → 6 pairs or 12 chromosomes or 12 chromatids or 12 DNA molecules. After S or G₂ → 6 pairs or 12 chromosomes or 24 chromatids or 24 DNA molecules.

70. The enzyme, which helps to cut one strand of DNA duplex to release tension of coiling of two strands is:

- (A) DNA ligase (B) DNA polymerase-I (C) Topoisomerase (D) Helicase

Ans : (C)

Hint : The cutting (nicking) of one strand of DNA duplex to release tension is done by Topoisomerase.

71. The causal organism of Kala-azar is :

- (A) *Plasmodium vivax* (B) *Leishmania donovani* (C) *Trypanosoma lewsi* (D) *Wuchereria bancrofti*

Ans : (B)

Hint : Kala-azar is caused by *Leishmania donovani*, a flagellate protozoan.

72. During cell division the process that causes failure of separation of sister chromatids is called:

- (A) Coincidence (B) Interference (C) Non-disjunction (D) Complementation

Ans : (C)

Hint : Non-disjunction is the failure of separation of homologous chromosomes during meiosis - I or sister chromatids during meiosis-II / mitosis.

73. Nuclear membrane is formed around the groups of daughter chromosomes during the telophase by :

- (A) Endoplasmic reticulum (B) Lysosomes
(C) Golgi apparatus (D) Microbodies

Ans : (A)

Hint : Nuclear membrane is formed around the groups of daughter chromosomes during the telophase by Endoplasmic reticulum.

74. Which of the following is not true for meiosis?

- (A) Production of genetic variability
(B) Maintaining constancy of chromosome number during sexual reproduction
(C) Reduction of chromosome number to one half
(D) Production of diploid cell

Ans : (D)

Hint : As a result of meiosis only haploid cells are produced.

75. Cytoskeletal network of a cell is built by a process called:

- (A) Triphasic polymerization (B) Biphasic polymerization
(C) Trendmilling (D) Dynamic instability

Ans : (D)

Hint : Cytoskeletal network of a cell is built by a process called Dynamic instability

76. In which animal cells polytene chromosomes are noticed?

- (A) Man (B) Reptiles (C) Bird (D) *Drosophila*

Ans : (D)

Hint : Polytene chromosomes are found in *Drosophila* (Salivary glands)

77. Which cell organelle is present in both prokaryotic and eukaryotic cells?

- (A) Endoplasmic reticulum (B) Mitochondria
(C) Nucleus (D) Ribosome

Ans : (D)

Hint : Ribosomes are found both in prokaryotes and eukaryotes.

78. Which one of the following is stored in lysosome?

- (A) Secretory glycoproteins (B) Hydrolytic enzymes
(C) RNA and protein (D) Fat, sugar, ATP

Ans : (B)

Hint : Lysosomes are rich in hydrolytic enzymes

79. Which of the following pair of amino acids are acidic?

- (A) Glycine and glutamate (B) Aspartate and valine
(C) Alanine and methionine (D) Glutamate and aspartate

Ans : (D)

Hint : Glutamate [Glutamic acid] and Aspartate [Aspartic acid] contain more-COOH groups and are considered acidic amino acids.

80. Which of the following is used as the mitotic spindle poison?

- (A) Ca^{++} (B) Mg^{++} (C) Tubulin (D) Colchicine

Ans : (D)

Hint : Spindle depolymerization is caused by Colchicine

Category II (Q81 to Q105)

Only one answer is correct. Correct answer will fetch full marks 2. Incorrect answer or any combination of more than one answer will fetch – ½ marks

81. Kranz type of leaf anatomy is observed in

- (A) C_3 plants (B) C_4 plants
(C) C_3 and C_4 plants (D) Hydrophytic plants

Ans : (B)

Hint : Kranz anatomy (Kranz = wreath) occurs in the leaves of C_4 plants

82. Synthesis of glucose from sources other than carbohydrate is called

- (A) Glycolysis (B) Glycogenesis
(C) Gluconeogenesis (D) Glycogenolysis

Ans : (C)

Hint : Gluconeogenesis is a process of synthesis of glucose from non-carbohydrate sources in the liver.

83. Which of the following equations is correct in respect of osmotic phenomenon ?

- (A) $DPD = OP - TP$ (B) $DPD = OP + TP$
(C) $DPD = OP \times TP$ (D) $DPD = OP \div TP$

Ans : (A)

Hint : $DPD = OP - TP$

84. When a colour blind female offspring is born ?

- (A) Father is colour blind but mother is carrier
(B) Father is colour blind but mother is normal
(C) Father and mother both are normal
(D) Father is normal but mother is carrier

Ans : (A)

Hint :

	X^c	Y
X^c	X^cX^c	X^cY
X	X^cX	XY

85. Seed dormancy can be broken by the following combination of chemicals

- (A) GA_3 , IAA and ABA
- (B) KNO_3 , GA_3 and Ethylene chlorohydrin
- (C) NAA, 2,4,5-T and IAA
- (D) ABA, BAP and GA_3

Ans : (B)

Hint : Seed dormancy can be broken by KNO_3 , GA_3 and Ethylene chlorohydrin

86. Seedless fruits can be induced by

- (A) ABA and IAA
- (B) ABA and Zeatin
- (C) IAA and GA_3
- (D) Ethylene and ABA

Ans : (C)

Hint : Seedless fruit (parthenocarpic fruit) are produced by the application of IAA and GA_3

87. The entire reactions of C_4 pathway takes place in

- (A) Mesophyll and bundle sheath
- (B) Vascular bundle and palisade tissue
- (C) Mitochondria and peroxisome
- (D) Bundle sheath and endoplasmic reticulum

Ans : (A)

Hint : The entire reactions of C_4 pathway takes place in mesophyll and bundle sheath

88. Which of the following statements on human kidney is false ?

- (A) Renal plasma flow is normally 660 ml/minute
- (B) Blood flow in the cortex is greater than that in the medulla
- (C) Reabsorption of ions and water occurs mainly in the distal convoluted tubules
- (D) The renal blood flow is decreased in dehydration

Ans : (C)

Hint : Reabsorption of ions and water occurs mainly in PCT

89. The function of our visceral organs are controlled by

- (A) Sympathetic and somatic nervous system
- (B) Sympathetic and parasympathetic nervous system
- (C) Central and somatic nervous system
- (D) None of the above

Ans : (B)

Hint : Sympathetic and parasympathetic divisions of autonomic nervous system control functioning of visceral organs

90. Which of the following hormones contains iodine ?

- (A) Inhibin
- (B) FSH
- (C) Prolactin
- (D) Thyroxine

Ans : (D)

Hint : Thyroxine is iodinated tyrosine

91. Where majority of the reabsorption takes place ?

- (A) Renal capsule
- (B) Proximal convoluted tubule
- (C) Collecting duct
- (D) Ascending limbs of the loop of Henle

Ans : (B)

Hint : Major site of reabsorption is PCT of nephron

92. In homeotherms the brain centre which regulate body temperature is located in

- (A) Cerebrum (B) Cerebellum
(C) Medulla oblongata (D) Hypothalamus

Ans : (D)

Hint : Hypothalamus of diencephalon is the thermostate of the body

93. 'Edge effect' is observed in case of

- (A) Ecozone (B) Ecotone (C) Biotope (D) Ecosphere

Ans : (B)

Hint : Edge effect is the increased biodiversity in ecotone

94. The basilar membrane of the cochlea

- (A) Is unaffected by movement of fluid in the scala of vestibule
(B) Covers the oval window and round window
(C) Vibrates in a pattern determined by the form of the travelling wave in the fluids of the cochlea
(D) Vibrates when body is subjected to linear acceleration

Ans : (C)

Hint : Basilar membrane of cochlea vibrates by the travelling sound waves in the fluid of cochlea

95. A renewable exhaustible natural resource is

- (A) Coal (B) Petroleum (C) Minerals (D) Forest

Ans : (D)

Hint : Forest is a renewable exhaustible natural resource

96. Which one of the following micro-organisms is used as a biofertilizer ?

- (A) *Bacillus* (B) *Azospirillum*
(C) *Pseudomonas* (D) *Saccharomyces*

Ans : (B)

Hint : *Azospirillum* (diazotroph)

97. The symptoms of an allergic reaction develop in response to

- (A) Interferons (B) Interleukins (C) Histamine (D) Complement

Ans : (C)

Hint : Histamine is vasodilator initiating allergic response

98. Which one of the following matching pairs is WRONG ?

- (A) Bacterial cell wall - cellulose (B) Bacterial ribosome - 16s rRNA
(C) Bacterial flagella - protein (D) Bacterial glycocalyx - cellulose

Ans : (A)

Hint : Bacterial cell wall is made of peptidoglycan

** In addition to option (A), option (D) is also incorrect as glycocalyx of bacteria also lack cellulose

99. Community dynamics is related to

- (A) Population growth in an ecosystem
(B) Recycling of nutrients in an ecosystem
(C) Flow of energy in an ecosystem
(D) Ecological succession

Ans : (D)

Hint : Ecological succession

100. In plants, both cellulose and hemicellulose are major components of which one of the following ?

- (A) Plasma membrane (B) Cell wall
(C) Nuclear membrane (D) Mitochondrial membrane

Ans : (B)

Hint : Cell wall is mainly composed of cellulose and hemicellulose

101. When does replication of centriole occur?

- (A) Interphase (B) Prophase (C) Late prophase (D) Late telophase

Ans : (A)

Hint : Replication (duplication) of centriole occurs in S-phase of interphase.

102. Match the following items in column-I with those in column-II and choose the correct answer:

Column-I	Column-II
P. Plasma membrane mainly contains	i. Hemicellulose
Q. Middle lamella mainly composed of	ii. Calcium pectate
	iii. Proteinaceous filaments
	iv. Proteins embedded in phospholipid bilayer

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

Ans : (C)

Hint : Plasma-membrane mainly contains extrinsic and intrinsic proteins embedded in phospholipid bilayer
Middle lamella is mainly composed of calcium pectate and some amount of magnesium pectate also

103. Select the correct combination of statements for DNA fingerprinting:

- i. It is an ELISA based technique
ii. It is a PCR based technique
iii. It is used by forensic scientists
iv. It is based on the fingerprint of an individual
v. It is a test for paternity

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

Ans : (B)

Hint : DNA finger printing is used in forensic science including test for paternity. It involves PCR and is based on RFLP. (Restriction Fragment Length Polymorphism)

104. In terms of evolutionary origin, which one of the following is correct?

- (A) Birds are closer to mammals
(B) Birds are closer to reptiles
(C) Both bats and birds originated from the same ancestor group
(D) Birds originated from animals like flying lizards

Ans : (D)

Hint : Birds evolved from Sauropsida reptiles however mammals evolve from Synapsid reptiles.

105. Progression of cell cycle is regulated by the concentration of which type of molecule?

- (A) Centrosomes (B) Cyclin-dependent kinases
(C) Cyclins (D) Microtubules

Ans : (B)

Hint : Progression of cell cycle is regulated by the concentration of cyclin-dependent kinases.

CATEGORY - III (Q106 to Q115)

One or more answer(s) is (are) correct. Correct answer(s) will fetch marks 2. Any combination containing one or more incorrect answer will fetch 0 marks. If all correct answers are not marked and also no incorrect answer is marked then score = 2 × number of correct answers marked / actual number of correct answers.

106. Match the items in Column-I with those in Column-II and choose the correct answer:

Column-I	Column-II
P. PCR	i. Insertion of a vector into target cell
Q. Transformation	ii. Post-transcriptional modification of protein
R. DNA ligation	iii. Replication of DNA
S. Ribozyme action	iv. Creation of recombinant DNA

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

Ans : (B)

Hint : PCR is a technique for DNA replication. Transformation is a technique to transfer vector into target cell. Ribozyme is RNA with enzymatic property used in post transcriptional modification

107. Which of the following statements(s) is/are correct about *Macropus* spp.?

- (A) They are metatherian mammals.
 (B) They are only found in Austria.
 (C) They have true placenta.
 (D) External ears are present.

Ans : (A,D)

Hint : *Macropus* is found in Australia and belongs to Metatheria.

108. Which of the following statements on the Red blood cells in human cells in human is/are True?

- (A) Measures about 15 μm in diameter
 (B) Do not contain mitochondria
 (C) Have a life span of 120 days in the circulation
 (D) Are released from the bone marrow as mature red blood cells

Ans : (B,C)

Hint : RBC of human is without mitochondria and other cell organelles. It is released in the blood and circulate for a day in the blood stream as reticulocytes before developing into matured erythrocytes. It's life span in circulation is 120 days.

109. Photosynthesis cannot be operated in :

- (A) Red light (B) Yellow light (C) Green light (D) Blue light

Ans : (C)

Hint : Photosynthesis is negligible in green light

110. Which of the followings can bring about the denaturation of proteins?

- (A) Reaction to salts of heavy metals
 (B) Reaction to acid and bases
 (C) Reaction to inorganic neutral salts
 (D) Preservation at a temperature below -5°C

Ans : (A,B,C)

Hint : Denaturation of protein is caused by salts of heavy metals; acid and bases and even in reactions with inorganic neutral salts.

111. In embryo sac double fertilization means:
- (A) Formation of double zygote
 - (B) Fusion between egg and male gamete
 - (C) Formation of perisperm
 - (D) Fusion between secondary nucleus and male gamete

Ans : (B,D)

Hint : Double fertilization is characteristic of angiosperm.

112. Which cells of the ovary are involved in the synthesis of estrogen?
- (A) Theca interna cells
 - (B) Granulosa cells
 - (C) Interstitial cells
 - (D) Theca externa cells

Ans : (A,B)

Hint : Androgen produced by theca cells is converted into oestrogen by granulosa cells in presence of aromatase. Androgen diffuse from theca cells into adjacent granulosa cells where they are converted into oestrogen.

113. Select the correct statement(s) pertaining to transpiration process in plants:
- (A) It is a necessary evil for plants.
 - (B) Loss of water takes place through hydathodes in vapour form.
 - (C) It may also occur through lenticels.
 - (D) The process is active during night in C_3 plants.

Ans : (A,C)

Hint : Transpiration is a necessary evil for plants (water is continuously lost during the process even during stress but is important for ascent of sap and metabolism). Transpiration also occurs by lenticels,

114. Which of the following statement(s) is/are correct?
- (A) Silicosis is the result of exposure to silica that causes permanent lung damage and death.
 - (B) Transportation of gases and digested food materials in the body of higher animals causes muscle weakness and fatigue
 - (C) ADH is a neurohypophysial hormone that regulates body water
 - (D) Myasthenia gravis is a neuromuscular disease that is mediated by circulatory system

Ans : (A,C,D)

Hint : Silicosis is an occupational lung disease that causes progressive respiratory failure and death. ADH is synthesized from hypothalamic nuclei and are responsible for water absorption by nephron. Myasthenia gravis is an autoimmune disorder mediated by antibodies.

115. Select the correct combination of statements for the neurotransmitters:
- (A) Acetylcholine is inactivated mainly by presynaptic reuptake.
 - (B) Tyrosine is essential for the formation of dopamine.
 - (C) Adrenaline is formed by methylation of the noradrenaline.
 - (D) Serotonin is synthesized form phenylalanine.

Ans : (B,C)

Hint : Tyrosine amino acid is required for synthesis of dopamine. Adrenaline is formed by methylation of noradrenaline using Phenylethanolamine N-methyltransferase.

