

**SOLUTIONS & ANSWERS FOR KERALA MEDICAL ENTRANCE
EXAMINATION-2010 – PAPER II
VERSION – B1**

[BIOLOGY]

1. Ans: Biological names are generally in Greek and written in italics.
Sol: Biological names are generally written in Latin language.
2. Ans: a – 4, b – 3, c – 2, d – 1
Sol: All the paired groups in the option b are correct.
3. Ans: Protists are prokaryotic
Sol: Protists are eukaryotic.
4. Ans: Cyanobacteria
Sol: Heterocysts help in N₂ fixation.
5. Ans: *Trypanosoma*
Sol: *Trypanosoma* bears two flagella.
6. Ans: Carolus Linnaeus
Sol: The publication of Linnaeus is Systema Naturae, which accounts the classification of organisms.
7. Ans: a – 4, b – 1, c – 2, d – 3
Sol: All the paired groups in option c are correct.
8. Ans: *Dictyota*, *Polysiphonia*, *Porphyra*, *Laminaria* and *Fucus*
Sol: All the diagrams are of algal members.
9. Ans: *Fucus*
Sol: Generally the algae are haplontic, but *Fucus* is diplontic.
10. Ans: *Salvinia*
Sol: *Salvinia* produces two types of spores hence is heterosporous.
11. Ans: *Petunia* – Fumigatory
Sol: *Petunia* is an ornamental plant.
12. Ans: $\oplus, \ominus, K_{2+2} C_4 A_{2+4} \underline{G(2)}$
Sol: Mustard flower shows hypogynous and tetradynamous nature.
13. Ans: (b) and (c) are true but (a) is false
Sol: Male and female gametophytes do not have an independent existence in gymnosperms.
14. Ans: *Alstonia*
Sol: More than two leaves arise at a node in *Alstonia*, hence whorled phyllotaxy.
15. Ans: Companion cells
Sol: Companion cells are seen in phloem.
16. Ans: Sclerenchyma cells are usually dead and without protoplasts
Sol: Sclerenchyma are dead and devoid of protoplasts.
17. Ans: *Cassia*
Sol: *Cassia* flower is zygomorphic and imbricate in nature.
18. Ans: Axile, Basal, Parietal and Free central
Sol: All the diagrams of placentation are correctly given in the option c.
19. Ans: (a) and (b) are false but (c) is true
Sol: Flowers are seen in acropetal fashion in racemose inflorescence and in rose flower, the ovary is half–inferior.
20. Ans: Double fertilization is unique to gymnosperms and monocotyledons
Sol: Double fertilization is seen in angiosperms only.
21. Ans: Scutellum
Sol: Only in monocotyledons, the cotyledon is named as scutellum.
22. Ans: Lenticels
Sol: Lenticels are the lens–shaped openings seen on the woody stem and help in gaseous exchange.

- 23. Ans:** (b) and (d) only are correct
Sol: Centrioles are absent in plant cells. Middle lamella is made up of calcium pectate.
- 24. Ans:** Ribosome
Sol: Ribosomes do not have any membrane.
- 25. Ans:** Flemming
Sol: Chromosomes get stained by basic dyes and this feature was identified by Flemming.
- 26. Ans:** Cristae
Sol: Cristae are the infoldings of inner membrane of mitochondrion.
- 27. Ans:** Pachytene
Sol: Tetrad formation begins in zygotene but clearly visible only in pachytene.
- 28. Ans:** Elaioplasts – Starch
Sol: Elaioplasts store oil droplets.
- 29. Ans:** Concanavalin A
Sol: Concanavalin A is a secondary metabolite belonging to the category of lectins.
- 30. Ans:** IV, III, II, I
Sol: Enzyme – complex theory accounts the enzymatic action on substrate.
- 31. Ans:** Cellulose – Heteropolymer
Sol: Cellulose is a Homopolymer.
- 32. Ans:** a – 3, b – 4, c – 1, d – 2
Sol: Sulphur is present in the amino acid methionine.
- 33. Ans:** Ca, Mg, Cu and K
Sol: Necrosis is due to the deficiency of Ca, Mg, Cu, K.
- 34. Ans:** Oxaloacetic acid
Sol: Oxaloacetic acid is the first stable 4 carbon compound obtained in C₄ cycle.
- 35. Ans:** Adhesion
Sol: Cohesion and adhesion helps in conduction of water inside xylem.
- 36. Ans:** 3 ATP molecules
Sol: One molecule of NADH gives rise to 3 molecules of ATP.
- 37. Ans:** PS II – P700
Sol: PSII has pigment P₆₈₀.
- 38. Ans:** Helps in translocation of sugars from source to sink
Sol: Translocation of sugar from source to sink is due to pressure flow.
- 39. Ans:** Manganese and Chlorine
Sol: Manganese and chlorine are the minerals taking part in photolysis of water.
- 40. Ans:** *Pseudomonas*
Sol: *Pseudomonas* is a denitrifying bacterium.
- 41. Ans:** The primary CO₂ acceptor is a 5 carbon molecule.
Sol: The primary CO₂ acceptor is a 3 carbon molecule, PEP in C₄ cycle.
- 42. Ans:** 0.7
Sol: R.Q value for fatty acids is less than one.
- 43. Ans:** Leaf buds – Banana
Sol: Banana exhibits sucker modification of stem.
- 44. Ans:** *Zostera*
Sol: Hydrophyllity is been exhibited by *Zostera*.
- 45. Ans:** a – 2; b – 1; c – 4; d – 3; e – 5
Sol: Gemmules are the asexual reproductive structures present in sponges.
- 46. Ans:** Exine has apertures called germ pores where sporopollenin is present.
Sol: Exine has apertures called germ pores where sporopollenin is absent.
- 47. Ans:** Synergids, Polar nuclei, Central cell, Antipodals, Filiform apparatus and Egg
Sol: Labelling provided in option 'a' are correct.
- 48. Ans:** $dN/dt = rN$
Sol: $\frac{dN}{dt} = rN$

- 49. Ans:** Osmotic problems
Sol: Fresh water animals will lose water from their cells when kept in sea water resulting in dehydration and death.
- 50. Ans:** (a) and (b) only
Sol: Carbon cycle and nitrogen cycle are gaseous cycle sulphur and phosphorus cycle are sedimentary cycles.
- 51. Ans:** 22%
Sol: Species diversity of plants on earth is 22%.
- 52. Ans:** CFCs and N₂O
Sol: CFC's contribute 14% and N₂O contribute 6% of total global warming.
- 53. Ans:** The energy content in a trophic level is determined by considering a few individuals of a species in that trophic level.
Sol: The energy content in a trophic level is determined by considering the total number of individuals of a species in that trophic level.
- 54. Ans:** Precipitation of soluble inorganic nutrients into the soil horizon as unavailable salts is called mineralisation.
Sol: Breakdown of complex materials into simple elemental forms is known as mineralisation.
- 55. Ans:** Biomagnification
Sol: Accumulation of non-biodegradable substance in food chain and its increase in concentration at each trophic level is known as biomagnification.
- 56. Ans:** Commensalism
Sol: Commensalism is an association where one of the species is benefitted whereas the other species is unaffected.
- 57. Ans:** Dobson units
Sol: Ozone thickness is measured in Dobson units.
- 58. Ans:** Cotton bollworms and corn borer respectively
Sol: Cry II Ab produce toxins controlling cotton boll worms.
Cry I Ab produce toxins controlling corn borers.
- 59. Ans:** *Agrobacterium tumefaciens*
Sol: *Agrobacterium tumefaciens* is used as a vector in genetic engineering.
- 60. Ans:** pBR 322
Sol: pBR 322 is an artificially constructed vector plasmid.
- 61. Ans:** Ammonia and methane
Sol: Oxygen combined with ammonia and methane to form water and CO₂
- 62. Ans:** *Ramapithecus*
Sol: *Ramapithecus* and *Dryopithecus* are the primates existed 15 Mya
- 63. Ans:** Saltation
Sol: It is proposed by Hugo de Vries.
- 64. Ans:** Body supported by chitin
Sol: In sponges body is supported by spicules or spongin fibres.
- 65. Ans:** i) c ii) d iii) a iv) e v) b
Sol: Choanocytes – Porifera
Cnidoblasts - Coelenterata
Flame cells - Platyhelminthes
Nephridia - Annelida
Comb plates - Ctenophora
- 66. Ans:** Aschelminthes
Sol: Aschelminthes is pseudocoelomate.
- 67. Ans:** *Ichthyophis*
Sol: *Ichthyophis* is limbless amphibian
- 68. Ans:** Homodont type of dentition
Sol: Dentition of mammals is heterodont.
- 69. Ans:** *Struthio*
Sol: *Struthio* is Ostrich.
- 70. Ans:** *Planaria*
Sol: *Planaria* possess high regeneration capacity.

- 71. Ans:** i and iii only
Sol: *Balaenoptera* is blue whale and *Delphinus* is common dolphin.
- 72. Ans:** Areolar tissue
Sol: Areolar tissue present beneath the cell.
- 73. Ans:** 6 - 9
Sol: Spermathecae is located in 6 – 9 segments. One pair in each segment
- 74. Ans:** Punnett square
Sol: It was developed by R.C. Punnett.
- 75. Ans:** z – gene
Sol: The z – gene code for β galactosidase
- 76. Ans:** *Antirrhinum*
Sol: Snapdragon or *Antirrhinum* is a good example of incomplete dominance.
- 77. Ans:** i) c ii) d iii) a iv) e v) b
Sol: UUU - Phenylalanine
 GGG - Glycine
 UCU - Serine
 CCC - Proline
 AUG - Methionine
- 78. Ans:** In domesticated fowls the sex of the progeny depends on the type of sperm that fertilizes the egg.
Sol: In domesticated fowls sex is determined by the ovum.
- 79. Ans:** i, iii, and iv
Sol: I^A and I^B are dominant over i and I^A and I^B are codominant. I^A , I^B and i represent the three alleles.
- 80. Ans:** i i
Sol: i i do not produce any sugar
- 81. Ans:** Klinefelter's syndrome
Sol: Klinefelter syndrome is due to XXY (Trisomy of sex chromosome)
- 82. Ans:** Ribozyme
Sol: 23 s rRNA in bacteria is the enzyme – ribozyme.
- 83. Ans:** sex – linked inheritance
Sol: The gene responsible for haemophilia is located in X chromosome.
- 84. Ans:** SNP
Sol: SNP is single nucleotide polymerism
- 85. Ans:** Turner's syndrome
Sol: Turners syndrome is a chromosomal disorder.
- 86. Ans:** Alec Jeffreys.
Sol: DNA finger printing was initially developed by Alec Jeffreys.
- 87. Ans:** Lysine and arginine
Sol: Histones are rich in basic amino acid residues lysine and arginine.
- 88. Ans:** Transcription
Sol: Transcription takes place in the nucleus.
- 89. Ans:** II and III are correct.
Sol: mRNA provides the template for sythesis of protein. Exon code for polypeptide.
- 90. Ans:** CsCl gradient
Sol: CsCl is used in density gradient centrifugation
- 91. Ans:** Splicing
Sol: Splicing occur during the processing of mRNA.
- 92. Ans:** $\frac{2123}{2123}$
Sol: $\frac{2123}{2123} \times 2 = 32$ is the human dental formula for permanent teeth.
- 93. Ans:** Pepsin, lipase, rennin.
Sol: Gastric juice contains pepsin, lipase, rennin.
- 94. Ans:** Monocytes – secrete heparin
Sol: Monocytes are phagocytic in action.
- 95. Ans:** The thoracic cavity is anatomically an air tight chamber.
Sol: The thoracic cavity is anatomically an air tight chamber.
- 96. Ans:** Hepatopancreatic duct.
Sol: Hepatopancreatic duct is guarded by sphincter of oddi.

97. Ans: 104 mm Hg

Sol: PO₂ in the alveolar air is 104 mm Hg

98. Ans: i - b ii - a iii - d iv - c

Sol: Option E has correct matchings.

99. Ans: Axon terminal, synaptic vesicles, synaptic cleft, receptors and neurotransmitters.

Sol: a - axon terminal, b - synaptic vesicle, c - synaptic cleft, d - receptors and e - neurotransmitters.

100. Ans: Aldosterone

Sol: Aldosterone is the main mineralocorticoid

101. Ans: Ventricles of heart.

Sol: Chordae tendinae hold AV valves in position.

102. Ans: 25 - 30 gm

Sol: 25 - 30 gm of urea is excreted per day.

103. Ans: Two

Sol: Amphibians and man are bicondylic.

104. Ans: Vestibular apparatus

Sol: Vestibular apparatus is composed of 3 semi - circular canals and the otolith organ.

105. Ans: Muscular dystrophy

Sol: Muscular dystrophy is the genetic disorder affecting the skeletal muscle.

106. Ans: Amino acid derivative.

Sol: Adrenal medullary hormones are amino acid derivative.

107. Ans: a - 5 b - 4 c - 2 d - 1

Sol: Option A has correct pairings.

108. Ans: Medulla oblongata.

Sol: Respiratory rhythm centre control the normal respiration.

109. Ans: Melatonin

Sol: Melatonin is secreted by Pineal gland.

110. Ans: i and iii are correct.

Sol: Troponin is distributed at regular intervals on the tropomyosin

111. Ans: Retina

Sol: Retina is the innermost photosensitive layer of the eye.

112. Ans: Placenta

Sol: Placenta secrete hCG.

113. Ans: Prostate

Sol: A single prostate gland is present in human.

114. Ans: Parturition

Sol: Parturition is induced by oxytocin.

115. Ans: Plague - Viral disease

Sol: Plague is a bacterial disease.

116. Ans: Nile perch.

Sol: Introduction of alien species lead to loss of biodiversity.

117. Ans: i) c ii) d iii) a iv) e v) b

Sol: Option c has correct matchings.

118. Ans: Cytokine barriers.

Sol: Interferons are glycoproteins produced by viral infected cells.

119. Ans: Ig A

Sol: Colostrum is the first formed milk during the initial days of lactation

120. Ans: Heroin

Sol: Heroin is commonly called 'smack'