

SOLUTION & ANSWER FOR KERALA MEDICAL ENTRANCE EXAMINATION-2009 VERSION – B1

[BIOLOGY]

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| <p>1. Ans: Ionic Bond</p> <p>Sol: Bonds formed by electrical attractions between ions bearing opposite charges are the ionic bonds.</p> | <p>Sol: Veins are distributed in grasses and palms with a prominent parallelly running veins.</p> |
| <p>2. Ans: Charles Darwin</p> <p>Sol: Charles Darwin provided the concept of dynamic or everchanging nature of species by discarding fixity of species.</p> | <p>11. Ans: Cyathium</p> <p>Sol: Cyathium is a special type of inflorescence showing involucre with numerous male flowers surrounding the female flower.</p> |
| <p>3. Ans: a – 2, b – 3, c – 4, d – 1, e – 5</p> <p>Sol: Ascus and basidium are the features of fungi. Cyanobacteria are monerans.</p> | <p>12. Ans: <i>Opuntia</i></p> <p>Sol: Spines of <i>Opuntia</i> are the modification of leaves.</p> |
| <p>4. Ans: Monograph</p> <p>Sol: Monograph is one of the taxonomic aid.</p> | <p>13. Ans: Free central</p> <p>Sol: Ovules are borne on the central axis of the ovary, where in which the septa are absent.</p> |
| <p>5. Ans: Adolf Engler and Karl Prantl</p> <p>Sol: Phylogenetic classification accounts the classification of organisms based on evolutionary relationship.</p> | <p>14. Ans: a and c are correct</p> <p>Sol: In apple, thalamus is the edible part and hypanthodium inflorescence is seen in <i>Ficus</i> plant.</p> |
| <p>6. Ans: Myxomycetes</p> <p>Sol: Myxomycetes are the slime moulds of primitive fungal features.</p> | <p>15. Ans: Sessile, bracteate, bracteolate, incomplete, uni or bisexual, perianth modified into lodicules, stamens three, syncarpous, superior ovary and feathery stigma</p> |
| <p>7. Ans: Thalamiflorae</p> <p>Sol: Thalamiflorae is the primitive series in the sub class polypetalae.</p> | <p>Sol: Poaceae is the monocot grass family</p> |
| <p>8. Ans: Cycadopsida</p> <p>Sol: Cycadopsida, coniferopsida and Gnetopsida are the three classes of Gymnosperms.</p> | <p>16. Ans: a, d and e only</p> <p>Sol: Syngenesious anthers are seen in Asteraceae.</p> |
| <p>9. Ans: <i>Oxalis</i></p> <p>Sol: <i>Oxalis</i> shows the subaerial stem modification runner.</p> | <p>17. Ans: <i>Crotalaria juncea</i></p> <p>Sol: <i>Erythrina indica</i> is Indian coral tree
<i>Glycine max</i> is soya bean
<i>Arachis hypogea</i> is ground nut</p> |
| <p>10. Ans: Grasses and Palms</p> | <p>18. Ans: 1 – e, 2 – f, 3 – a, 4 – b, 5 – d</p> |

- Sol: All the matchings given in the option E are correct.
- 19. Ans:** a – 4, b – 5, c – 1, d – 2, e – 3
- Sol: All the matchings given in the option C are correct.
- 20. Ans:** Sap wood
- Sol: Alburnum is the light coloured functional secondary wood.
- 21. Ans:** Callose
- Sol: Sieve pores of sieve plates are get impregnated with the callose material.
- 22. Ans:** (a) and (b) are true; but (c) and (d) are wrong.
- Sol: The first formed xylem is the protoxylem. Radial vascular bundles are seen in roots.
- 23. Ans:** Differential interference contrast microscopy.
- Sol: Differential interference contrast microscopy is used for the study of unstained living cells.
- 24. Ans:** Fluorescent microscopy uses the normal light to view molecules
- Sol: Fluorescent microscopy uses u.v light for viewing molecules.
- 25. Ans:** Tonoplast
- Sol: Vacuolar membrane is living and semipermeable.
- 26. Ans:** Lysosomes
- Sol: Lysosomes are common in animal cells for intracellular digestion.
- 27. Ans:** a and b are correct
- Sol: Amyloplast stores starch, Aleuroplast stores protein and Elaioplasts store oil and fats.
- 28. Ans:** Cytochrome
- Sol: Cytochrome is an Fe containing heme–protein involved in the e^- transportation.
- 29. Ans:** Enzyme
- Sol: Enzymes are proteins
- 30. Ans:** Cyanide action on cytochrome oxidase
- Sol: Cyanide inhibits the mitochondrial enzyme needed for respiration.
- 31. Ans:** Pachytene
- Sol: Crossing over of homologous non–sister chromatids occur in pachytene stage.
- 32. Ans:** Henry Dixon
- Sol: Melvin Calvin identified the C_3 cycle Blackmann and Englemann worked in photosynthesis. Hans Krebs identified the Krebs cycle reaction.
- 33. Ans:** b, c and d only
- Sol: The events given in the option B are correct.
- 34. Ans:** Nitrogenase
- Sol: Nitrogenase enzyme is responsible for atmospheric N_2 fixation.
- 35. Ans:** Asparagine
- Sol: Asparagine and glutamine are the amides seen in plants.
- 36. Ans:** 3–phosphoglycerate
- Sol: 3–phosphoglycerate results by means of the combination of RuBP and CO_2 in presence of RuBisCO.
- 37. Ans:** P_{680} and P_{700} are the reaction centres of PSI and PSII respectively.
- Sol: P_{680} is the reaction centre of PSII and P_{700} is the reaction centre of PSI.
- 38. Ans:** a, b and d only

- Sol: Photolysis of H_2O in light reaction is accelerated by the minerals Mn, Ca and Cl.
- 39. Ans:** RuBP carboxylase oxygenase
- Sol: RuBisCO is the most abundant enzyme protein seen in the living world.
- 40. Ans:** 4
- Sol: Organic acids like oxalic acid shows RQ value as 4 due to the presence of abundant O_2 and least number of carbons.
- 41. Ans:** Cytoplasm
- Sol: Pentose Phosphate Pathway (PPP) is an alternate step seen in respiration.
- 42. Ans:** ATP synthase
- Sol: In ETS, five complexes are present, of these ATP synthase is the last V complex for ATP synthesis.
- 43. Ans:** Megaspore divides twice to form an eight nucleate embryo sac.
- Sol: Megaspore always divides thrice to form the 8 nucleated embryo sac.
- 44. Ans:** All the three statements [a, b and c] are correct
- Sol: The statements given are correct.
- 45. Ans:** Ethylene gas
- Sol: Ethylene gas is known as the fruit ripening hormone in plants.
- 46. Ans:** a – 3, b – 1, c – 4, d – 2
- Sol: Zeatin, Florigen, IBA and NAA are the phytohormones.
- 47. Ans:** Photoperiodism
- Sol: Organisms respond to the diurnal variations and the rhythms of environment.
- 48. Ans:** Sciophytes
- Sol: Light tolerant plants are the heliophytes. Psammophytes are the sand tolerant plants.
- 49. Ans:** *Pinus wallichiana*
- Sol: Temperate coniferous forest is characterised by needle like leaves.
- 50. Ans:** Ecotype
- Sol: Locally adapted population is the Ecotype. Ephemerals are the short lived plants.
- 51. Ans:**
- $$\frac{\text{Energy in biomass production at a trophic level} \times 100}{\text{Energy in biomass production at previous trophic level}}$$
- Sol: Ecological efficiency means the efficiency of energy consumption in herbivores and carnivores of an ecosystem.
- 52. Ans:** 33% for plains and 67% for hills
- Sol: National Forest Policy (1988) in India recommends 33% in plains and 67% in hilly areas.
- 53. Ans:** Minerals
- Sol: Minerals, petroleum products and biological species are the non-renewable resources.
- 54. Ans:** Phosphates
- Sol: Phosphates are generally get deposited as the sedimentary geochemical substances in an ecosystem.
- 55. Ans:** Electrostatic precipitator
- Sol: ESP is used for the control of particulate matter in the polluted air.
- 56. Ans:** (a) and (c) only
- Sol: Anthropogenic air pollutants are the man made and the oxides of N_2 causes brown air in traffic congested areas.
- 57. Ans:** a – 3, b – 4, c – 2, d – 1

- Sol: The relative green house gas contributions is 60% CO₂, 20% CH₄, 14% CFC_s and 6% N₂O.
- 58. Ans:** *Fusarium graminearum*
- Sol: Single cell proteins are obtained from the microbes and other organisms.
- 59. Ans:** Maize
- Sol: Shakti, Ratan and protina are the lysine amino acid enriched maize variety.
- 60. Ans:** Tick fever
- Sol: *Babesia bigemina* is a protozoan parasite spread by the ticks.
- 61. Ans:** Hugo –devries
- Sol: The theory was based on his work on *Oenothera lamarckiana*.
- 62. Ans:** Peppered moth
- Sol: All others are domesticated organisms.
- 63. Ans:** Carboniferons
- Sol: It is a period began about 370 mya and ended 280 mya.
- 64. Ans:** Euplectella
- Sol: It is a sponge
- 65. Ans:** Echinodermata
- Sol: It is the locomotory organ of echinodermates.
- 66. Ans:** Fishes
- Sol: Amphibians – 3 chambered heart, Birds and Mammals – 4 chambered heart.
- 67. Ans:** 1 – b, 2 – c, 3 – a, 4 – e, 5 – d
- Sol: Cockroach – Malphigiantubules
Clarias – Kidneys
Earth worm – Nephridia
Belanoglossus – Proboscis gland
Flat worm – Flame cell
- 68. Ans:** a – Spermatheca, b – Testis, c – Seminal Vesicle, d – Ovary, e – Vas deferens, f – Accessory gland
- Sol: Earth worm is a bisexual animal.
- 69. Ans:** Each of the fore limbs and hind limbs end in five digits.
- Sol: In frog fore limbs end in four digits.
- 70. Ans:** Stratum lucidum
- Sol: Stratum corneum is the outer most layer.
- 71. Ans:** 1 only
- Sol: Uterine and vestibular bartholins and preputial glands are the accessory glands associated with genital organs in female rats.
- 72. Ans:** Nervous tissue
- Sol: Schwann cells occurs in the region of nerve fibres.
- 73. Ans:** 1 – e, 2 – d, 3 – c, 4 – b, 5 – a
- Sol: Epithelium is classified based on the shape, number of layers and presence of structures like flagella.
- 74. Ans:** Ww × ww
- Sol: Monohybrid test cross ratio is 1 : 1
- 75. Ans:** Flower colour in pea
- Sol: Flower colour in four 'O' clock plant shows incomplete dominance.
- 76. Ans:** CAC/GTG GUG valine
- Sol: Sickle cell anaemia is due to a change in single base pair.
- 77. Ans:** Inversion
- Sol: It is a chromosomal abberation.
- 78. Ans:** (1), (2) and (4) are correct

- Sol: Sickle cell anaemia is an autosomal disorder.
- miniature winged recombinants are fewer than the expected ratio.
- 79. Ans:** 3' UUACGGAAUUCG – 5'
- 88. Ans:** *Agrobacterium tumefaciens*
- Sol: In RNA uracil take the position of thymine.
- Sol: Tumour inducing (Ti) plasmid is seen in *Agrobacterium tumefaciens*.
- 80. Ans:** Multiple allelism
- 89. Ans:** DNA ligase
- Sol: ABO blood group shows multiple allelic gene inheritance as I^A, I^B and i
- Sol: DNA ligase is known as the 'molecular scissors' used in recombinant DNA technology.
- 81. Ans:** 30%
- 90. Ans:** Retrovirus
- Sol: Since the guanine is 20%, then cytosine is also in 20%. The remaining 60% constitute adenine and thymine in 30% each.
- Sol: The desired healthy genes required for SCID is obtained from the DNA by means of reverse transcription method, hence required retrovirus.
- 82. Ans:** 12 : 3 : 1
- 91. Ans:** Dystrophin
- Sol: One gene masks or modify the expression of other gene, in the fruit of summer squash dominant characters are in more number.
- Sol: Duchenne Muscular Dystrophy causing gene (dystrophin) is seen in X-chromosome with 2400 kilobase pairs.
- 83. Ans:** Fredrick Griffith
- 92. Ans:** Holozoic
- Sol: The direct transfer of genetic material from one strain to another is the transformation.
- Sol: It is the mode of nutrition in animals.
- 84. Ans:** UAA
- 93. Ans:** Vitamin K
- Sol: UAA, UAG and UGA are the non-coding codons, hence no tRNA sequence for these codons.
- Sol: It is a fat soluble vitamin.
- 85. Ans:** a – v, b – i, c – iv, d – ii, e – iii
- 94. Ans:** Thecodont, Heterodont and Diphyodont
- Sol: All the matched groups seen in the option 'a' are correct.
- Sol: Thecodont – fixed in jaw socket
Heterodont – Different type of teeth
Diphyodont – Two sets of teeth
- 86. Ans:** Uracil
- 95. Ans:** a – iii, b – v, c – ii, d – i, e – iv
- Sol: The pyrimidine uracil is seen in RNA only, likewise the thymine is present only in DNA.
- Sol: Salivary amylase – Starch
Bile salts – Emulsification of fats
Rennin – Milk protein
Pepsin – Protein
Steapsin – Lipids
- 87. Ans:** 37.2
- 96. Ans:** The H⁺ released from carbonic acid combines with haemoglobin to form haemoglobinic acid
- Sol: Morgan identified linkage in fruitfly hence the percentage of white eyed and
- Sol: $\text{H}^+ + \text{HCO}_3 + \text{kHb} \rightleftharpoons \text{H.Hb} + \text{kHCO}_3$

- 97. Ans:** Inter atrial septum
Sol: It represents the remnant of foramen ovale.
- 98. Ans:** Artherosclerosis
Sol: This may result in heart attack
- 99. Ans:** The counter current system contribute in diluting the urine.
Sol: It contribute to concentrating urine.
- 100. Ans:** Uric acid
Sol: Birds are uricotelic
- 101. Ans:** The dialysis unit has a coiled cellophane tube
Sol: Haemodialysis is a method to remove excess urea from the blood.
- 102. Ans:** Femur
Sol: It is the thigh bone
- 103. Ans:** Bowman's glands
Sol: Mucus produced by Bowman's glands absorbs odoriferous substances that stimulate the receptors on the cilia.
- 104. Ans:** Sarcomere
Sol: Sarcomere is the unit of muscle contraction.
- 105. Ans:** Troponin fibrous protein
Sol: Troponin is a globular protein.
- 106. Ans:** a – white matter, b – grey matter, c – dorsal root, d – ventral root, e – spinal nerve
Sol: The diagram shows a cross section of the spinal cord.
- 107. Ans:** Hind brain
Sol: Pons, cerebellum and medulla together constitute hind brain.
- 108. Ans:** i – v, ii – d, iii – a, iv – e, v – c
Sol: The parts of eye is matched with their function.
- 109. Ans:** TSH
Sol: TSH is thyroid stimulating hormone.
- 110. Ans:** a – v, b – i, c – iv, d – ii, e – iii
Sol: The hormones are matched their secretory organs.
- 111. Ans:** Parathyroid Hormone
Sol: It is concerned with metabolism of calcium.
- 112. Ans:** Budding
Sol: It is a common method of reproduction in hydra.
- 113. Ans:** Hyaluronidase
Sol: Acrosome carries hyaluronidase.
- 114. Ans:** a – 4, b – 1, c – 2, d – 5, e – 3
Sol: All the matched groups given in the option 'd' are correct.
- 115. Ans:** Critically endangered
Sol: Red data book accounts the threatened species as critically endangered, endangered vulnerable and rare species.
- 116. Ans:** *Papaver somniferum*
Sol: Morphine is an opiate narcotic used as analgesic drug.
- 117. Ans:** a – iii, b – v, c – iv, d – ii, e – i
Sol: All the grouped matchings given in the 'a' option are correct.
- 118. Ans:** a – 4, b – 1, c – 2, d – 3
Sol: All the paired groups given in the option 'e' are correct.

119.Ans: HIV selectively infects and kills B– lymphocytes

Sol: HIV selectively infects and kills T – helper cells

120.Ans: Magnetic Resonance Imaging

Sol: MRI scan avoids the exposure of patients to the harmful ionising radiations. It selects the hydrogen for scanning purpose.

