SOLUTIONS & ANSWERS FOR KERALA MEDICAL ENTRANCE EXAMINATION-2013 – PAPER – 2
VERSION – B1

[BIOLOGY]

1. Ans: In plants, growth by cell division is seen only upto a certain stage.

Sol: In plants, growth is continuous.

2. Ans: a – 4, b – 3, c – 2, d – 1

Sol: All are correctly matched in the option A.

3. Ans: Cyanobacteria

Sol: All the given characters are seen in cyanobacteria.

4. Ans: (i), (iii) and (iv) are correct

Sol: Taxon represents different levels in taxonomic hierarchy.

5. Ans: Lichens do not grow in unpolluted areas.

Sol: Lichens do not grow in polluted areas.

6. Ans: a – 4, b – 3, c – 2, d – 1

Sol: All are correctly matched in the option A.

7. Ans: a – 4, b – 3, c – 2, d – 1

Sol: All are correctly matched in the option D.

8. Ans: Order – Primata

Sol: Man belongs to primata order.

9. Ans: They possess well differentiated vascular tissues.

Sol: Bryophytes are non-vascular plants.

10. Ans: II and III are correct but I and IV are wrong

Sol: Floridean starch is seen in rhodophyceae. Sporophyte is dominant in diplontic life cycle.

11. Ans: 1. Anther 2. Ovary 3. Microspore 4. Zygote 5. Embryo

Sol: All are correctly matched in the option A.

12. Ans: I and III are correct but II and IV are wrong

Sol: Region of maturation is root hair region. Maize and sugarcane have stilt roots.

13. Ans: I and III are correct but II and IV are wrong

Sol: Whorled phyllotaxy is seen in *Alstonia*. Buds seen in the axil of leaves and not in compound leaf.

14. Ans: *Sesbania* and belladonna

Sol: *Sesbania* belongs to fabaceae and belladona belongs to solanaceae.

15. Ans: Cucumber and Pumpkins

Sol: Tendrils are the modification of axillary buds of stem.

16. Ans: a – 2, b – 1, c – 3

Sol: All are correctly matched in the option A.

17. Ans: Parenchyma and sclerenchyma.

Sol: Parenchyma is living and sclerenchyma is dead.

18. Ans: Zygomorphic, bisexual, sepals five and gamosepalous, petals five and papilionaceous, anthers ten and diadelphous, ovary superior and monocarpellary.

Sol: Correct explanation is given for the floral formula of fabaceae in the option C.

19. Ans: Ten stamens, diadelphous and dithecous anther.

Sol: *Pisum sativum* belongs to Fabaceae family.

20. Ans: a – 3, b – 1, c – 5, d – 2, e – 4

Sol: All are correctly matched in the option D.

21. Ans: (a) and (b) alone are correct

Sol: The first formed xylem is called protoxylem. Phloem fibres are made up of sclerenchymatous cells.

22. Ans: Periderms and secondary phloem only.

Sol: Bark the refers to periderm and secondary phloem.

23. Ans: a – 4, b – 3, c – 2, d – 1

Sol: All the matches in option B are correct.

24. Ans: Ribosomes are about 30nm by 50nm in size.

Sol: Ribosomes are about 15nm by 20nm size

25. Ans: (b) and (c) alone are correct.

Sol: Endomembrane system includes ER, Golgi bodies, lysosome and vacuole. 70S ribosome present in Mitochondria.

26. Ans: (b) and (d) only

Sol: Amyloplast stores starch. Chlorophyll is present in thylakoids.

27. Ans: Vacuoles

Sol: All the given statements are the features of Vacuoles.

28. Ans: (a) and (d) only

Sol: All the options given in A are correct.

29. Ans: Inulin is a polymer of glucose.

Sol: Inulin is a polymer of fructose

30. Ans: a – 3, b – 4, c – 2, d – 1

Sol: All the matches in option A are correct.

31. Ans: II and III only

Sol: All the options in B are correct.

32. Ans: Chamber A has higher water potential and water will move from A to B.

Sol: Water molecules move from higher water potential to lower water potential.

33. Ans: (i) and (iii) only

Sol: Adhesion – attraction between water and wall of xylem. Cells burst in hypotonic solution.

34. Ans: (ii) and (iii) alone are correct

Sol: Sulphur is present in cysteine and methionine. Nitrification is carried by *Nitrosomonas* and *Nitrobacter*.

35. Ans: 3 and 2 molecules of ATP respectively.

Sol: NADH produces 3 molecules of ATP and $FADH_2$ produces 2 molecules of ATP.

36. Ans: a – 4, b – 5, c – 1, d – 2, e – 3

Sol: All matches in the option A are correct.

37. Ans: (i), (iii) and (iv) only

Sol: Calvin cycle occurs in mesophyll cells of C_3 plants.

38. Ans: I and III only

Sol: Glycolysis occurs in cytoplasm. Oxidative phosphorylation in cristae.

39. Ans: Enzyme hexokinase catalyses the phosphorylation of glucose to glucose -6 phosphate.

Sol: Incomplete oxidation of glucose takes place in glycolysis.

40. Ans: Conversion of succinyl – CoA to succinic acid.

Sol: GTP is synthesized during the conversion of succinyl CoA to succinic acid.

41. Ans: Proton gradient

Sol: Chemi - osmosis requires a membrane, a proton pump, proton gradient and ATPase.

42. Ans: Boron, Magnesium and Molybdenum

Sol: All the minerals given in option E are correct.

43. Ans: a – 4, b – 3, c – 2, d – 1

Sol: All the matches in the option E are correct.

44. Ans: (c) and (d) only

Sol: ABA stimulates closure of stomata, auxins promotes apical dominance and also used as a herbicide.

45. Ans: It guides the entry of pollen tube into a synergid and discharge the male gamete.

Sol: It guides the entry of pollen tube to a synergid cell.

46. Ans: a – 2, b – 4, c – 1, d – 3

Sol: All the matches in option A are correct.

47. Ans: Buttercup

Sol: Hetrophyllous development occurs due to the environment in buttercup plant.

48. Ans: (b) and (e) are wrong.

Sol: Pyramid of energy is always upright.

49. Ans: A higher RBC (Red Blood Cell) count than people living in the plains.

Sol: At higher attitudes RBC count increases.

50. Ans: Mortality and Emigration

Sol: Mortality and emigration decreases population density.

51. Ans: I and II only

Sol: Monarch butterfly and birds exhibit predation. *Ophrys* and wasp show mutualism and sexual deceit.

52. Ans: Amensalism

Sol: Antibiotic effect of penicillin is amensalism.

53. Ans: 50 m deep below the earth's surface

Sol: Radioactive waste disposal is one of the most important problematic issue.

54. Ans: Platinum, Palladium and Rodium

Sol: Catalytic converters reduce poisonous emissions from automobiles.

55. Ans: Easy to lay down pipelines for delivery

Sol: CNG pipeline laying is the major issue regarding CNG supply.

56. Ans: 30 – 35%

Sol: 30 – 35% of salt content is there in sea water as measured it in parts per thousand.

57. Ans: N_2O and methane

Sol: N_2O accounts 6%, methane 20%, CFCs 14% and CO_2 60 % in green house effect.

58. Ans: Plasmid DNA – Vector

Sol: Plasmid DNA is used as vector.

59. Ans: Six bases pairs.

Sol: RENs generally preferred six base sequences of palindrome.

60. Ans: Human insulin is being commercially produced from a transgenic species of *Agrobacterium tumifaciens*.

Sol: Human insulin is commercially produced from the transgenic species of *E.coli*.

61. Ans: Insect eating.

Sol: Darwin's finches exhibit adaptive radiation.

62. Ans: Devonian

Sol: Palaeozoic era consists the periods like silurian, devonian and carboniferous.

63. Ans: Genetic recombination helps in maintaining Hardy - Weinberg equilibrium.

Sol: Genetic recombination may affect Hardy - Weinberg equilibrium.

64. Ans: Ctenophora

Sol: Ctenophora bears eight external rows of ciliated comb plates which help in locomotion.

65. Ans: 1 – b, – i, 2 – c – ii, 3 – e – iii, 4 – a – v, 5 – d – iv

Sol: All matches given in option C is correct.

66. Ans: III, IV and V only are correct.

Sol: Pelvic fins of male shark bears claspers.

67. Ans: Flame cells – Defense

Sol: Flame cells help in osmoregulation and excretion.

68. Ans: Prostomium contains the mouth.

Sol: Mouth is present in the peristomium.

69. Ans: Touch

Sol: Sensory papillae is associated with touch.

70. Ans: a – phallic gland, b – small tubules, c – vas deferens, d – ejaculatory duct, e – right phallomere.

Sol: All the parts given in option A is correctly identified.

71. Ans: 1, 3 and 5 alone are correct

Sol: Hind limbs of frog end in five digits.

72. Ans: 2, 3 and 4 alone are wrong

Sol: Cartilage has solid and pliable matrix.

73. Ans: Modified polysaccharides.

Sol: Modified polysaccharides accumulate between cells and fibres and act as matrix.

74. Ans: 2, 3 and 5 alone are correct.

Sol: A recessive parental trait is expressed only in its homozygous condition.

75. Ans: i - e ii – a, iii – b iv – c v – d

Sol: All matches given in option B are correct.

76. Ans: I and III alone are correct

Sol: Sickle cell anaemia is an autosomal recessive trait.

77. Ans: 3 alone is correct

Sol: Two nucleotides are linked through 3' – 5' phosphodiester linkage to form a dinucleotide.

78. Ans: DNase

Sol: DNase is DNA degrading enzyme and thereby inhibiting the transformation process.

79. Ans: i - c ii – a, iii – f iv – e v – d

Sol: All matches given in option D are correct.

80. Ans: II and III alone are wrong

Sol: The possibility of female becoming haemophilic is extremely rare.

81. Ans: The additional sequences of mRNA that are not translated are present only at the 5' end.

Sol: UTR's are present at both 5' and 3' ends.

82. Ans: RNA being a catalyst is non-reactive and stable.

Sol: RNA being a catalyst is more reactive and less stable.

83. Ans: Intervening sequences appear in mature RNA.

Sol: Introns or Intervening sequences do not appear in mature or processed RNA.

84. Ans: i, ii and v only

Sol: Okazaki fragments are produced during replication process.

85. Ans: Methionine

Sol: AUG codes for methionine (met) and it also acts as the initiator codon.

86. Ans: II, VI, V, III, I and IV

Sol: Option B gives correct sequence of steps in DNA fingerprinting.

87. Ans: tRNA

Sol: tRNA has an aminoacid acceptor end to which it binds to amino acids.

88. Ans: ^{15}N

Sol: The heavy isotope used for proving semi - conservative method of replication is ^{15}N.

89. Ans: 1 and 4 alone are correct

Sol: In the presents of lactose, repressor is inactivated.

90. Ans: Ribozyme

Sol: 23S rRNA in bacteria act as Ribozyme.

91. Ans: Repetitive sequences are stretches of RNA.

Sol: Repetitive sequences are stretches of DNA sequences.

92. Ans: Frenulum – Attaches the tongue to the floor of buccal cavity

Sol: Rugae are irregular folds of mucosa seen in the stomach.

93. Ans: i - b ii – a, iii – d iv – c

Sol: All the matches given in option B are correct.

94. Ans: It is the site of diffusion of oxygen and carbon dioxide.

Sol: Diffusion of oxygen and carbon dioxide occurs in the exchanging part of respiratory system.

95. Ans: O_2 transported by RBC – about 97%. in the blood

Sol: Nearly 20 – 25 percent of CO_2 is transported by RBCs.

96. Ans: ii and iv only

Sol: Inactive fibrinogen is converted into fibrin.

97. Ans: i - c ii – d, iii – a, iv – e, v – b

Sol: All the matches given in option C are correct.

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

Sol: All the matches given in option E are correct.

99. Ans: II, IV and V alone are correct

Sol: Ascending limb of Henle's loop is impermeable to water.

100. Ans: 1, 3 and 4 alone are correct.

Sol: In the centre of each 'I' band there is an elastic fibre called Z line.

101. Ans: Scapula

Sol: The dorsal flat triangular body of scapula has an elevated ridge called spine. Which project as expanded process called acromion.

102. Ans: Nitrogenous wastes

Sol: Nitrogenous wastes are absent in dialyzing fluid.

103. Ans: Nerve impulses are generated and transmitted by efferent fibres to the auditory cortex of the brain.

Sol: Nerve impulses are generated and transmitted by afferent fibres to the auditory cortex of the brain.

104. Ans: Somatostatin secreted by hypothalamus stimulates the secretion of somatotrophic hormone.

Sol: Somatostatin secreted by hypothalamus inhibits in secretion of somatotrophic hormone.

105. Ans: Regulates the diurnal rhythm.

Sol: Melatonin play an important role in the regulation of diurnal rhythm of our body.

106. Ans: Fall in glomerular filtration rate

Sol: Renin converts angiotensinogen in blood to angiotensin I.

107. Ans: 1 and 3 only are correct

Sol: Expiration takes place only when intra - pulmonary pressure is higher than the atmospheric pressure.

108. Ans: Platelets

Sol: Megakaryocytes are special cells in the bone marrow.

109. Ans: Impulse transmission across an electrical synapse is faster than across a chemical synapse.

Sol: Electrical current can flow directly from one neuron to other across synapse.

110. Ans: Opsin

Sol: Light induces dissociation of retinal from opsin.

111. Ans: II and III only

Sol: Receptors associated with aortic arch and carotid artery recognize changes in CO_2 and H^+ ions.

112. Ans: Haploid spermatids

Sol: The spermatid are transformed into sperm by the process called spermiogenesis.

113. Ans: Intra - uterine device

Sol: IUD increases phagocytosis of sperm within the uterus.

114. Ans: Myasthenia gravis

Sol: Myasthenia gravis is an autoimmune disorder affecting neuromuscular junction.

115. Ans: Alexander von Humboldt

Sol: The relation between species richness and area for a variety of taxa (angiosperm plants) turns out to be a rectangular hyperbola.

116. Ans: Habitat loss and fragmentation, over exploitation, alien species invasion, co-extinction.

Sol: The accelerated rate of species extinction that the world is facing now largely due to human activities.

117. Ans: IgA

Sol: This is a type of passive immunity.

118. Ans: II alone is correct.

Sol: Secretion of interferons is a cytokine barrier of innate immunity.

119. Ans: 1 – d, – v, 2 – a – iv, 3 – e – i, 4 – b – ii, 5 – c – iii

Sol: All matches in option D are correct.

120. Ans: Cocaine

Sol: It has potent stimulating action on CNS, producing a sense of euphoria and increased energy.