SOLUTIONS & ANSWERS FOR KERALA MEDICAL ENTRANCE EXAMINATION-2011 – PAPER II
VERSION – B1

[BIOLOGY]

1. Ans: a-4, b-3, c-2, d-1

Sol: All the pairs in option A are correct

2. Ans: b and c only

Sol: Cat – Felidae
Dog – Canidae

3. Ans: *Saccharomyces*

Sol: *Saccharomyces* is an Ascomycetes.

4. Ans: *Albugo* - Chrysophytes

Sol: *Albugo* is a phycomycetes

5. Ans: They have indestructible wall layer deposited with silica.

Sol: Wall layer deposition results in the formation of diatomaceous earth.

6. Ans: Ascomycetes

Sol: Ascomycetes is fungus.

7. Ans: Viruses are obligatory parasites.

Sol: Virus that infects plants have single stranded RNA.

8. Ans: a-2, b-3, c-4, d-1

Sol: All the pairs in option B are correct.

9. Ans: a and d only.

Sol: *Dictyota* is a brown algae.

10. Ans: *Pteris* and *Adiantum*

Sol: *Selaginella* and *Lycopodium* come under lycopsida.

11. Ans: b and d are correct but a and c are wrong.

Sol: Whorled phyllotaxy is seen in *Alstonia*.

12. Ans: *Petunia* Solanaceae

Sol: Petunia is an ornamental plant.

13. Ans: a-4, b-1, c-5, d-3, e-2

Sol: All the pairs in option c are correct.

14. Ans: China rose

Sol: The stamens are united in to one bundle.

15. Ans: Grapevine and pumpkins.

Sol: Tendrils that develop from axillary buds help the plants such as cucumber, pumpkin water melon and grapevine to climb.

16. Ans: b and c only

Sol: Maize and sugarcane has stilt roots.

17. Ans: a-3, b-5, c-4, d-2, e-1

Sol: Fleshly cylindrical stem is seen in Euphorbia.

18. Ans: a-Valvate, b-Twisted,
c-Imbricate, d-Vexillary

Sol: *Calotropis* exhibits valvate aestivation.

19. Ans: Pericycle cells

Sol: Initiation of lateral roots during secondary growth takes place in the pericycle.

20. Ans: Bulliform cells.

Sol: Bulliform cells are present in monocot leaves.

21. Ans: *Pisum*

Sol: The given characteristics refers to Fabaceae family.

22. Ans: $\oplus\ \female\ K_{(5)}\ \overline{C_{(5)}\ A_{(5)}}\ \underline{G_{(2)}}$

Sol: It is the feature of solanaceae.

23. Ans: Red blood cells.

Sol: RBC is round and biconcave shape with out nucleus

24. Ans: Glycosidic bond

Sol: Glycosidic bond seen in polysaccharides and are formed between two carbon atoms of two adjacent monosaccharide.

25. Ans: a and b only.

Sol: G_0 is the quiescent stage.

26. Ans: Transferase

Sol: Enzyme catalyses the transferring of a group.

27. Ans: b, c and d are correct

Sol: Ribosomes are protein synthesis factory.

28. Ans: i and iv only

Sol: In peroxidase and catalase which catalyse the breakdown of hydrogen peroxide to waters and oxygen, haem is a prosthetic group.

29. Ans: Lysine is a neutral amino acid

Sol: Lysine is a basic amoniacid.

30. Ans: Collagen is the most abundant protein in the whole of the biosphere and RuBisCO is the most abundant proteins in animal world.

Sol: RuBisCO is the most abundant protein in the plant world.

31. Ans: Interkinesis

Sol: Interkinesis is followed by prophase II

32. Ans: Magnesiumj and manganese

Sol: Manganese helps in photolysis of water.

33. Ans: Pinus seeds cannot germinate and establish without the presence of mycorrhiza.

Sol: In plants water loss in liquid phase is known as guttation.

34. Ans: The intermediate compound which links glycolysis with Kreb's cycle is malic acid

Sol: Acetyle Co-A is the intermediate compound that links glycolysis with Kreb's cycle.

35. Ans: Imbibition

Sol: Imbiition is the special type of diffusion when water is absorbed by solids colloids causing them to increase in volume.

36. Ans: Photosystems I and II are involved in Z scheme.

Sol: Z – Scheme is also known as non-cyclic photophosphorylation.

37. Ans: b and c only

Sol: *Nitrosomonas* oxidizes ammonia to nitrite.

38. Ans: Primary CO_2 fixation product - PGA

Sol: Primary CO_2 fixation product is oxaloacetic acid.

39. Ans: 3 ATP and 2 $NADPH_2$

Sol: 3 ATP and 2 NADPH are required for the reduction and regeneration processes in C_3 cycle.

40. Ans: Phosphoglycolate

Sol: Phosphoglycolate is the first compound formed during photorespiration.

41. Ans: Conversion of succinyl CoA to succinic acid.

Sol: One molecule of GTP is converted to one molecule ATP during substrate level phosphorylation.

42. Ans: NADH dehydrogenase and cytochrome c oxidase complex

Sol: NADH dehydrogenase is present in complex I and cytochrome C oxidase is seen in complex IV

43. Ans: a-4, b-3, c-2, d-1

Sol: The diploid number of chromosome in rice is 24.

44. Ans: $W_1 = W_0 e^{rt}$

Sol: The exponential growth can be expressed as $W_1 = W_0 e^{rt}$

45. Ans: a-4, b-5, c-1, d-3, e-2

Sol: Conidia are the characteristic of *Penicillium*.

46. Ans: a, b and d are correct but c is wrong.

Sol: Water hyacinth and water lilly exhibit entomophily.

47. Ans: Terpenes - IAA

Sol: Gibberlins are terpene derivatives

48. Ans: a-2, b-4, c-1, d-3

Sol: Summer sleep is known as aestivation.

49. Ans: Coniferous forest

Sol: -1° C to 13° C temperature and 50 to 250 cm annual rain fall accounts for the formation of conifers.

50. Ans: a-5, b-4, c-1, d-2, e-3

Sol: *Ophrys* exhibits sexual deceit.

51. Ans: Primary consumers belong to the first trophic level.

Sol: Primary consumers belong to the second trophic level.

52. Ans: b and c only.

Sol: Nitrogen cycle is gaseous cycle and pyramid of biomass in sea is inverted.

53. Ans: An overwhelming majority of animals and nearly all plants maintain a constant internal temperature.

Sol: Most animals and nearly all plants do not maintain a constant temperature.

54. Ans: Secondary consumers.

Sol: Because carnivores feed on primary consumers

55. Ans: a-2, b-3, c-iv, d-1

Sol: Pacific salmon fish breeds only once in life time.

56. Ans: a-3, b-1, c-2

Sol: Electrostatic precipitator removes particulate matter, scrubber removes gases like SO_2 and catalytic converter removes automobile emission.

57. Ans: DDT

Sol: It result in thinning of egg shell.

58. Ans: Polymerase chain reaction

Sol: PCR is gene amplification method.

59. Ans: *Agrobacterium tumifaciens* - Tumour

Sol: *Agrobacterium tumifaciens* causes gall in many plants.

60. Ans: Emphysema

Sol: It can be cured by $\propto$-1 antitrypsin.

61. Ans: Thorn and tendrils of Bougainvillea and Cucurbita.

Sol: The others are analogous.

62. Ans: 900 cc

Sol: Brain size of Homo habilis is about 650 cc

63. Ans: Oparin and Haldane

Sol: This theory is known as theory of chemical evolution.

64. Ans: Excretion

Sol: Proboscis gland is associated with excretion.

65. Ans: i and ii

Sol: Parapodia are seen in aquatic annelids. Radula is the rasping organ of molluscs.

66. Ans: Asterias

Sol: In *Asterias* water vascular system perform excretion.

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

Sol: In option c all are correctly matched.

68. Ans: first, clitellum and last segments

Sol: Setae helps in locomotion.

69. Ans: a. Spermathecae, b. seminal vescicle, c. ovary, d. accessory gland and e-prostrate gland

Sol: Speematheca is present in the 6^{th}, 7^{th}, 8^{th}, and 9^{th} segment.

70. Ans: 2 and 3 are correct while 1 and 4 are wrong.

Sol: The medulla oblongata passes out through the foramen magnum and continues through the vertebra column.

71. Ans: 13

Sol: The nymph grows by moulting about 13 times to reach the adult form.

72. Ans: Connective tissue

Sol: Connective tissue consist of cells, matrix and fibres.

73. Ans: Squamous epithelium

Sol: It is composed of thin flat cells.

74. Ans: One

Sol: One gamete contain one allele.

75. Ans: X-ray diffracftion

Sol: Wilkins and Franklim carried out X-ray defraction studies in DNA.

76. Ans: Thymine

Sol: Thymine provide additional stability to DNA over RNA.

77. Ans: Thomas Hunt Morgan

Sol: T. H. Morgan experimentally proved that genes are located in chromosomes.

78. Ans: 44 Autosomes +XO

Sol: Turner's syndrome is due to the mullisomy of sex chromosome.

79. Ans: Capping

Sol: It is a step seen in the mRNA maturation in eukaryotes.

80. Ans: (i) and (iv) are correct

Sol: RNA polymerase II transcribe hnRNA.

81. Ans: Viral DNA

Sol: Phosphorus is a component of DNA.

82. Ans: Grasshopper

Sol: In grass hopper males are with only one X-chromosome.

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

Sol: All the pairs in the option 'B' are correct.

84. Ans: Deletions

Sol: Deletion is due to the loss of segment of chromosome.

85. Ans: Presence of lactose

Sol: Lactose acts as an inducer in lac operon.

86. Ans: 1 alone is wrong

Sol: Three codons do not code for any amino acid.

87. Ans: Rryy, RRyy

Sol: Rryy is round green because R is dominant.

88. Ans: 3.3×10^9 bp

Sol: The haploid content of human DNA is 3.3×10^9 bp.

89. Ans: VNTR

Sol: VNTR is variable number of Tandem Repeats.

90. Ans: Frederick Sanger

Sol: Automated DNA sequences work in the principle of the method developed by Frederic Sanger.

91. Ans: DNA polymorphism

Sol: Allelic sequence variations were more than one variant (allele) at a locus in a human population with a frequency greater than 0.01 is referred to as DNA polymorphism.

92. Ans: rugae

Sol: The infoldings in the mucosal layer of stomach is rugae.

93. Ans: ileo-caecal valve

Sol: The back flow of faecal matter in the large intestine is prevented by ileo-caecal valve.

94. Ans: Pons region of brain

Sol: Pneumotaxic centre can moderate the function of respiratory rhythm centre.

95. Ans: Reactivity of the gases

Sol: The factors that affect diffusion of gases are pressure / concentration gradient, solubility of gases and thickness of the membrane.

96. Ans: Basophils

Sol: Basophils secrete serotonin, histamine, heparin etc.

97. Ans: Heart failure

Sol: Heart failure sometimes called congestive heart failure because it is caused by the congestion of lungs.

98. Ans: The ascending limb of the Henle's loop extends as the DCT

Sol: DCT is the ascending limb of Henle's loop.

99. Ans: Uremia

Sol: Accumulation of urea in the blood is called uremia.

100. Ans: I and IV alone are correct.

Sol: During muscle contraction length of I band get reduced.

101. Ans: Meromyosin

Sol: Actin binding sites are located on meromyosin.

102. Ans: The second and seventh ribs

Sol: Scapula is a large triangular bone situated between second and 7^{th} ribs.

103. Ans: Resting potential

Sol: Resting potential is –70 mV

104. Ans: 2 and 3 are correct while 1 and 4 are wrong.

Sol: Adrenaline is hormone and act as neuro transmitter.

105. Ans: Ganglion cells, bipolar cells, photoreceptor cells.

Sol: Retina is the inner most layer of eye wall.

106. Ans: Cholecystokinin – stimulates pancreatic enzyme secretions.

Sol: Cholecystokinin is a gastro intestinal hormone.

107. Ans: a-2, b-3, c-4, d-1

Sol: All the pairs in the option 'E' are correct

108. Ans: Epinephrine

Sol: Epinephrine or adrenalin is an amino acid derivative.

109. Ans: 70 ml

Sol: During each cardiac cycle the ventricle pumps approximately 70 ml of blood.

110. Ans: ilium, ischium and pubis

Sol: Coxal bone of pelvic girdle is formed by the fusion of ilium, ischium and pubis.

111. Ans: corpus luteum

Sol: Corpus callosum connect the cerebral hemispheres together.

112. Ans: an oral contraceptive for females

Sol: Saheli is a non-steroidal preparation.

113. Ans: help in the collection of the ovum after ovulation.

Sol: Fimbriae are the finger like projections of infundibulum.

114. Ans: 12

Sol: Meiocyte is the cell undergoing meiosis.

115. Ans: Amazon rain forest

Sol: Amazon rain forest is called lungs of the planet.

116. Ans: Species diversity increases as we move away from the equator towards the poles.

Sol: Species diversity decreases as we move a way from the equator to the poles.

117. Ans: i-c, ii-e, iiii-a, iv-b, v-d

Sol: All the pairs in the option 'B' are correct.

118. Ans: Trichoderma

Sol: Cyclosporin A is produced by a fungus *Trichoderma polysporum*.

119. Ans: Penicillin

Sol: *Penicillin* is the first discovered antibiotic.

120. Ans: (i), (iv) and (v) alone

Sol: Wine and beer are non-distilled beverages.