DIVINE SECONDARY SCHOOL KITALA

**END OF TERM 2 EXAMS 2024**

S.5 BIOLOGY PAPER 1

(THEORY)

**TIME 2 ½ HOURS**

NAME…………………………………………………………………………………SIGN………………………….

***INSTRUCTIONS TO SEMI-CANDIDATES***

Answer all questions in both sections **A** and **B**

**SECTION A**

Write answers to this section in the boxes provided

**SECTION B**

Write answers to this section in the spaces provided and not anywhere else.

No additional sheets of paper should be inserted in this booklet.

SECTION A : (40 MARKS)

Write the letter to the correct answer in the corresponding box. Each question in this section carries one mark

1. A property of water that makes it a suitable component of a hydrostatic skeleton is its
2. High density
3. High surface tension
4. Low viscosity
5. Incompressibility
6. Myelinated axons of a frog conduct impulses three times less fast as those of same diameter in a rat because the
7. Myelin sheath in axons of a frog is thinner
8. Rat is endothermic
9. Neurons of a frog have more synapses.
10. Frogs lives in water which is cold
11. Aquatic organisms survive under solidified water bodies because
12. Water solidifies from bottom to top of lakes
13. Ice is less dense than water a 4oC.
14. Cold water is more dense than hot water and falls to the bottom
15. Warm water floats on top of cold water.
16. Which of the following correctly represents the effect of increasing substrate concentration on the degree of inhibition in a competitive and non-competitive reaction?

**Competitive**  **Non-competitive**

1. Decreased Increased
2. Decreased No change
3. Increased Decreased
4. No change Increased
5. Large steroid molecules diffuse quickly through cell surface membranes suggesting that the membranes
6. Consist of non-polar molecules
7. Are semi-permeable
8. Are freely permeable
9. Are made of polysaccharides.
10. Hydrophytes do not have wax-covered leaves because
11. They need much air for fast respiration
12. They do not need to conserve water
13. The wax would make the leaves heavy and sink
14. Their leaves cannot synthesise wax.
15. Evaporation of water from a body surface causes cooling because water has a high
16. Latent heat of vaporization.
17. Latent heat of fusion
18. Boiling point
19. Specific heat capacity
20. In a multi-enzyme controlled reaction;

Enzyme 1 enzyme 2 enzyme 3

A A C X,

If an excess of X controls the metabolic pathway of reaction, the control mechanism is known as,

1. Multi -enzyme control
2. Excess inhibition
3. End-product inhibition.
4. Negative feedback
5. Which of the following describes the turn-over number of an enzyme?
6. Number of molecules affected by the enzyme
7. Number of substrate molecules turned into its products per minute
8. Number of product molecules formed .
9. Number of substrate molecules catalysed per minute.
10. The first carbohydrate made in photosynthesis is
11. Ribose sugar
12. Ribulose
13. Phosphoglyceric acid
14. Phosphoglyceraldehyde
15. The epithelial type lining the mammalian alveoli is
16. Columnar
17. Cuboid
18. Stratified
19. Squamus
20. Which of the following is not a correct statement about nastic response?
21. The response may be a growth movement
22. The direction of movement of a plant is always related to the direction of the stimulus.
23. It is a response from non-directional stimuli.
24. The response movements are localized.
25. Long-day plants may be stimulated to flower if
26. The period of darkness is interrupted with flashes of light
27. Provided with more than 10 hours of light.
28. Provided with 12 hours of complete darkness
29. The light is interrupted with short dark period.
30. Anaerobes thrive better than aerobic organisms in waters experiencing thermal pollution because
31. High temperatures kill aerobic organisms.
32. Anaerobes possess enzymes that work best at high temperatures.
33. High temperatures reduce solubility of oxygen
34. High temperatures encourage multiplication of aerobes’ predators.
35. Which of the following is a simple branched tubular gland?
36. Brunner’s gland
37. Salivary gland
38. Sweat gland
39. Mammary gland
40. Which one of the following is not correct about cells of a tissue? They
41. Have similar function
42. Are of same origin
43. Are of one type
44. Have physical linkage
45. Which one of the following is the main form of the photosynthetic product transported through the phloem?
46. Starch
47. Amino acids
48. Sucrose
49. Glucose
50. High carbondioxide concentration in respiring tissues is important because it causes
51. Local vasodilation,allowing more blood into tissues.
52. Low ph in the tissues leading to unloading of oxygen
53. Local vasoconstriction creating high blood pressure
54. Increased heart beat.
55. Which one the following best describes basal metabolic rate?
56. Average amount of energy produced by the body.
57. Average amount of energy produced by an average body
58. Average amount of energy produced when at rest
59. Amount of energy produced when all voluntary movements have ceased.
60. Which one of the following is likely to occur if a photosynthesizing plant was suddenly removed from light?
61. Reduction in PGA
62. Accumulation of PGAL
63. Accumulation of PGA
64. No change in amount of PGAL.
65. Which one of the following tissues would be stained deepest red by a dye that stains nuclei red?
66. Sieve tube
67. Tracheid
68. Collenchyma
69. Cambium
70. In which of the following parts of a chroloplast are water splitting enzymes mostly locaed?
71. Stroma
72. Intergrana
73. Cytoplasm
74. Grana
75. Compared to carbohydrates,fas have higher energy value because fats
76. Have long chains of fatty acids
77. Have a higher proportion of hydrogen
78. Are more compact in structure
79. Have a high proportion of oxygen
80. Which of the following structures is found in both xylem and phloem tissues of higher plants ?
81. Sieved tracheids.
82. Parenchyma cells
83. Companion cells
84. Hollow vessels.
85. Which one of the following pairs of adjustments at a respiratory surface would increase its efficiency?
86. Decreasing the rate of ventilation and increasing blood supply
87. Increasing the rate of blood flow and the rate of ventilation
88. Increasing the ventilation rate and the distance of diffusion of molecules
89. Decreasing the blood supply and the distance of diffusion of molecules.
90. Which of the following have a sole function of offering support to the plant?
91. Sclerenchyma and vessel elements.
92. Vessel elements and tracheids.
93. Sclerenchyma and collenchymas.
94. Parenchyma and colenchyma.
95. If carbon-dioxide containing radio-active carbon was added to a suspension of photosynthesizing algae , in which one of the following compounds would the radio-active carbon show first?
96. Glucose
97. Phosphoglyceric acid
98. Ribulose biphosphate
99. Triose phosphate.
100. In higher plants, the problem of obtaining oxygen for respiration is solved by leaves possessing
101. Large intercellular spaces
102. Compact palisade layer
103. Thin lower epidermis
104. Numerous stomata on lower epidermis.
105. The compounds which act as oxidizing agents during anaerobic respiration in plants are.
106. NAD and pyruvic acid
107. Ethanol and NAD
108. NAD and FAD
109. NADP and pyruvic acid
110. Sucrose is a non-reducing sugar because it
111. It is not fully digested
112. Lacks reducing groups
113. Is a disaccharide molecule
114. Is a ketose sugar.
115. Which one of the following organelles would most likely be abundant in the tail of a tad-pole at a time of its reabsorption during metarmorphosis?
116. Centrioles
117. Lysosomes
118. Golgi apparatus
119. Endoplasmic reticulum
120. The main distinguishing character of eukaryotic cell is
121. Membraned organelles
122. Lack of nuclear membrane
123. Presence of nucleus
124. Presence of DNA double strands
125. Starch , glycogen and cellulose are all composed of
126. α-glucose
127. β-glucose
128. monosaccharides
129. polysaccharides
130. The primary meristematic tissue in plants which gives rise to the cortex is the
131. Ground meristem
132. Procambium
133. Protoderm
134. Protoxylem
135. Which of the following is the correct formula of a polysaccharide?
136. (C6H10O5)n
137. (CH2O)n
138. (C12H22O11)n
139. (C6H12O6)n
140. In higher plants , the lateral roots originate from the
141. Endodermis
142. Epidermis
143. Pericycle
144. Cambium
145. When the extent of inhibition in an enzyme controlled reaction depends entirely on the concentration of the inhibitor , it indicates that the inhibition is
146. Competitive
147. Reversible
148. Non-competitive
149. Irreversible.
150. The tails of phospholipids lie in the centre of the cell of the cell membrane due to their being
151. Light
152. Hydrophilic
153. Polar
154. Hydrophobic
155. Which of the following sugars is not reducing?
156. Maltose
157. Fructose
158. Galactose
159. Sucrose
160. Some amino acids are known as essential because they are
161. More important in the body metabolism than others
162. Not made by the body
163. Contained in first class proteins
164. Required in larger amounts than others.

**SECTION B (60 MARKS)**

Answer all questions in this section in the spaces provided

1. (a) What is photophosphorylation? (2 marks)

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(b) Where in the plant cell does cyclic photophosphorylation occur? (1 mark)

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(c) Describe the process of cyclic photosphosphorylation. (5 marks )

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(d) What is the importance of cyclic photophosphorylation in photosynthesis? (2 marks)

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1. (a) Define the term facilitated diffusion. (2 marks)

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(b) State three ways how facilitated diffusion differs from simple diffusion(3 marks)

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(c) State the parameters listed in Fick’s law of diffusion (3 marks)

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(d)State two ways how the action of carrier proteins is similar to that of enzymes (2 marks )

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1. (a) State the physiological importance of the following structural components of the plasma membrane
2. Proteins (3 marks)

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1. Carbohydrates (2 marks)

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1. Cholesterol (3 marks)

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(b) Explain why non-polar (lipid soluble ) molecules diffuse more rapidly through membranes than polar (lipid insoluble) molecules (2 marks)

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1. (a) Describe the structure of plasma membrane according to fluid mosaic model (6 marks)

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(b) How does the molecular structure of proteins relate to their function? (5 marks)

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(c) Explain the role of enzymes in enzyme specificity? ( 03 mark)

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(d) Explain how endocytosis and exocytosis occur across membrane? (6 marks)

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1. (a) Outline the biological importance of water to living organisms (6 marks)

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(b) Explain the physical properties of water as related to their importance (4 marks)

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1. (a) Explain the challenges faced by diving mammals (4 marks)

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(b) Explain why diving mammals have a reduced heart beat rate (3 marks)

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(c) Describe the structure of haemoglobin (3 marks)

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**END**

**DO NOT GIVE UP, U’RE ALMOST THERE**