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SEAT No. _____

[17]

Date: 19th April, 2018, Time: 10.00 A.M to 1.00 P.M
Paper: PS01EBIC22-Biomolecules and Bioenergetics

Total Marks: 70

Q.1 Select the appropriate answer for following questions. (08)

1. Which one of the following are an example of epimers?
(a) Glucose and Galactose (b) Glucose and Ribose
(c) Mannose and Glucose (d) a and c
2. The rate of mitochondrial respiration can be controlled by the availability of
(a) ATP (b) ADP (c) FAD (d) NAD⁺
3. Which of the following are found in connective tissues?
(a) Glycosaminoglycans (b) Proteoglycans
(c) Glycoproteins (d) Glycolipids
4. DNA denaturation is measured by absorbance at
(a) 220 nm (b) 230 nm (c) 250 nm (d) 260 nm
5. Which of the following glycerophospholipid acts as a lipotropic agent?
(a) Cardiolipin (b) Phosphatidylserine
(c) Phosphatidylinositol (d) Phosphatidylcholine
6. According to Henderson and Hassebach equation, when pH of a solution becomes equal to its pKa, the solution becomes buffer. This condition is achieved when _____
(a) Concentration of proton donor equals the concentration of protonacceptor
(b) Concentration of proton donor become zero
(c) Concentration of proton acceptor become zero
(d) Concentration of proton donor become $\log 1/10^{\text{th}}$ of concentration of proton acceptor
7. Which of the following statements best describes the enthalpy change of a reaction?
(a) The energy released when chemical bonds are formed during a chemical reaction
(b) The energy spent when chemical bonds are broken during a chemical reaction
(c) The difference between the energy released by bond formation and the energy consumed by bond cleavage during a chemical reaction
(d) The increase in disorder of the system as a reaction proceeds

(P.T.O.)
1

8. The proposal of chemiosmotic hypothesis was given by
- (a) Peter D. Mitchell (b) Charles Darwin
(c) Mendel (d) Alfred Russell

Q.2 Answer Any Seven in brief. (14)

1. Enlist reducing disaccharides and state its importance in biology.
2. Justify the statement "Carbohydrates act as informational molecules".
3. Give the common structural features of amino acids.
4. Write down the role of glycerophospholipids.
5. Write note on structure of tRNA.
6. Describe the functions of thermogenin protein.
7. Give the role of oxygenases involved in biological oxidation reactions.
8. Write note on inhibitors of electron transport chain.
9. Give the statement of laws of thermodynamics.

Q.3 (a) Write note on cyclic structures and importance of D-glucose in biology. (06)

(b) Describe the structures and biological functions of homopolysaccharides. (06)

OR

(b) Explain the role of lectin-ligand interactions in the biological processes. (06)

Q.4 (a) Describe the classification of amino acid based on R group in detail. (06)

(b) Give detail account on protein sequencing methods. (06)

OR

(b) Explain the structure and function of different types of sphingolipids. (06)

Q.5 (a) Define pKa value of acid and base and derive Henderson and Hassebach equation. (06)

(b) Describe the various types of bond formation in biological reaction and their importance. (06)

OR

(b) Give a detail account on the bicarbonate buffer system used in biology. (06)

Q.6 (a) What is chemiosmotic model? Describe the structure of ATP synthase complex with its function. (06)

(b) Define oxidative phosphorylation and explain the Type-I reaction of oxidative phosphorylation in green sulphur bacteria. (06)

OR

(b) Explain the structure and function of universal electron acceptor. (06)

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