



- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
➤ DON'T WRITE ANYTHING ON THE QUESTION PAPER

General Instruction: Answers should be substantiated with appropriate illustrations and diagrams.

PART – A (8 X 5 = 40 Marks)**Answer ALL Questions**

1. ✓ Despite the diversity of living organisms on earth, and ever evolving, describe how they are united in terms of their chemical behavior.
2. ✓ A weak diprotic acid can have buffering capacity at two different pH ranges. Substantiate this statement with a specific example.
3. ✓ Monosaccharides are best described in terms of their functional groups, number of carbons, stereochemistry and are prone to cyclization. Explain the chemistry of carbohydrates using appropriate examples.
4. ✓ Describe the reactions in the oxidative and non-oxidative phase of pentose phosphate pathway. How is this pathway linked with glycolysis?
5. ✓ Name and draw the structures of the following amino acids: (a) amino acid without side chain, (b) amino acid with one of the pKa near neutral pH, (c) aromatic amino acid, (d) amino acid with aliphatic hydroxyl group, (e) amino acid which can form disulfide linkages.
6. ✓ Sketch and explain the different types of secondary structures in proteins.
7. ✓ What are triacylglycerols and describe their properties and functional significance.
8. ✓ Describe the structural attributes and stability of ribonucleic acid and deoxy ribonucleic acid.

PART – B (6 X 10 = 60 Marks)**Answer ALL Questions**

9. ✓ Describe how the chemical reactions are facilitated within the biological system to proceed spontaneously and regulated to achieve balance and economy.
10. ✓ Water is a universal solvent for the existence of different life forms. Enumerate how water facilitates different biological processes in the extracellular and intracellular fluids?

11. Provide an overview of the different processes in cellular respiration. Highlight the major events in each of the phases.
12. Enumerate the diversity in the structure of homopolysaccharides which serve as storage forms of fuel and with structural roles.
13. a) Proteins in connective tissue and in blood as transporters have different structures to execute their specific functional roles. With specific examples substantiate the statement.

OR

13. b) Describe the structural features of glycoconjugates and highlight their role in proper functioning of the cell.
14. a) Classify fatty acids and their manifestation as glycerophospholipid. Also, explain the dependence of the fatty acid structure on intermolecular association and their health effects.

OR

14. b) The purine nucleotide is synthesized with elemental contributions from different biomolecules. Describe the steps involved in the de novo synthesis of purine nucleotide.

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