Question Paper

Molecules of Life

1.
   a) What will be the sequence of bases in m-RNA synthesized from the segment of a DNA 3′-AGAGCTAT-5′.
   b) Explain "rancidity" of oils and fats.
   c) What two factors commonly affect the activity of an enzyme?
   d) Define the terms anomers and epimers.
   e) What are essential and non-essential amino acids? Give two examples of each.
   f) Define the term isoelectric point.
   g) How many types of reactions are involved in metabolism? Discuss briefly with an example of each type.

2.
   a) Draw Haworth representation formulas of disaccharide Sucrose.
   b) What happen when freshly prepared aqueous solution of α-D-Glucose or β- D-glucose is kept at room temperature for sometime. Explain.
   c) Give the mechanism for the formation of glucosazone.
   d) Write Kiliani Fischer synthesis for upgrading aldopentose into aldohexose.

3.
   a) Write solid phase synthesis for a dipeptide Gly-Phe.
   b) Describe the Edmann degradation method of N- terminal amino acid determination.
   c) Using Gabriel phthalimide synthesis, how will you prepare alanine?
   d) A pentapeptide on partial hydrolysis gave three tripeptides fragments: Gly-Val-Ala, Phe-Gly-Val, Val-Ala-,Leu. Identify the sequence of the amino acid in a pentapeptide.

4.
   a) What are the different factors that give stability to the double helical structure of DNA.
   b) Explain the role of different types of RNA's used for protein biosynthesis.
   c) What is the difference between nucleosides and nucleotides? Give the structure of a adenosine-5′-triphosphate.

d) What do you mean by primary and secondary structure of nucleic acids?

5.

a) What is the significance of iodine number? Calculate the iodine number of glyceryl trioleate having Mol. Wt. 884 (Mol. Wt. of Iodine = 127)

b) What are phospholipids? Give its biological importance.

c) What is the difference between fats and oils?

d) Give the structure each of omega-3 and omega-6 fatty acids. Discuss their important role in biological system.

6.

a) What is enzyme inhibition? Explain allosteric inhibition.

b) Differentiate between apoenzyme and holoenzyme with example.

c) Which two steps in glycolysis involve the phosphorylation of ADP to ATP.

d) Give the structure of ATP. Why ATP is called energy storage compounds?

7. Write short notes on any **three** of the following:
   a) Secondary structure of proteins
   b) Genetic code
   c) Starch and Cellulose
   d) Glycolysis