Roll No. ……..

Unique Paper Code : 42177913

Name of the Paper : DSE: Molecules of Life

Name of the Course : B.Sc. Prog.

Semester : V

Duration : 3 hours

Maximum Marks : 75

Instructions for Candidate

1. Attempt any **four** questions.
2. Question no. 1 is **compulsory** carries 15 marks. All other questions are of 20 marks each.

1. Attempt any **five**: (3 x 5)

   a) Why do both glucose and fructose give positive Tollens and Fehling tests?

   b) Define the terms anomers and epimers with the help of example.

   c) How many types of reactions are involved in metabolism? Discuss briefly with an example of each type.

   d) What two factors commonly affect the activity of an enzyme?

   e) Name the method and reagent used to determine N-terminal and C- terminal amino acid in proteins.

   f) What are essential and non-essential amino acids? Give one examples of each.

   g) Name the nucleic bases present in RNA. Give the structure of any two.

2. (5 x 4)

a) What are disaccharides? Give the structure (Howarth projection) and systematic name of Maltose.

b) Write Merrifield solid phase synthesis for a dipeptide Tyr-Ala.

c) What is enzyme inhibition? Explain allosteric inhibition.

d) How will you convert:

   1. Glucose into mannose
   2. Glucose into n-hexane

3. (5 x 4)

a) Give the mechanism for the formation of glucosazone. Name the rearrangement that take place during its formation.
b) Use DNFB to distinguish between Ala-Phe and Phe-Ala. Give the reactions involved.
c) 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 the pentapeptide.
d) What is "rancidity" of oils and fats.

4. (5 x 4)

a) What is denaturation of proteins. Explain with suitable examples.
b) What is the difference between nucleosides and nucleotides? Give the structure of Guanosine-5′-triphosphate.
c) What is the significance of iodine number? Calculate the iodine number of glyceryl trioleate having Mol. Wt. 884 (Mol. Wt. of Iodine = 127).
d) Differentiate between apoenzyme and holoenzyme with example.

5. (5 x 4)

a) What are triglycerides and phospholipids? Give its biological importance.
b) Give the structures of omega-3 and omega-6 fatty acids. Discuss their important roles in biological system.
c) Explain the role of different types of RNA's used for protein biosynthesis.
d) What is the structure and function of ATP?

6. Write short notes on any **four** of the following: (5 x 4)

a) Globular and Fibrous proteins
b) Genetic code
c) Starch and Cellulose
d) Mutarotation
e) Tertiary structure of proteins