Your Roll No. .....

S. No. of the Question paper : 5844

Unique Paper Code : 2174001206

Name of the Paper : GE: Molecules of Life

Name of the Course : All Undergraduate Courses except with Chemistry Discipline

Semester : II

Duration : 2 hour

Maximum Marks : 60

Instructions for the candidates

1. Write your Roll no on the top immediately on the receipt of the question paper.

2. All questions have equal marks.

3. Attempt any four questions in all.

Q.1 Answer any five of the following:

a) Draw the structures of predominant forms of glycine at pH 3.0, 6.0 and 9.0.
b) Discuss the role of DCC in peptide synthesis.
c) What is invert Sugar? Why is it called so?
d) Explain briefly the structure-activity relationship of drug molecules.
e) What do you mean by C-terminal and N-terminal in a polypeptide? How many peptide bonds are there in a tetrapeptide?
f) Give the reactions of Glucose with (i) With bromine water and (ii) With concentrated nitric acid. (iii) HI/Red P

(3 x 5 = 15)

Q2 a) Explain the concept of reducing and non-reducing sugars with relevant examples.

b) How will you differentiate between α- Helix and β-pleated sheets?
c) How will you convert an Aldopentose to an Aldohexose?
d) What are essential amino acids? How do they differ from non-essential amino acids? Give two examples of essential amino acids and write their structures.

(4, 4, 4, 3)

Q3 a) What happens when D-Glucose is treated with excess of phenylhydrazine. Explain the reaction with mechanism.
b) Explain the Principle of Electrophoresis for separation of a mixture of amino acids.
c) Discuss the carboxypeptidase enzyme method for the C-terminal analysis of peptides.

(5, 5, 5)

Q4 a) How are Enzymes classified according to the Enzyme Commission?
b) Explain all the steps involved in the synthesis of dipeptide GLY-ALA.
c) Explain the effect of temperature and substrate concentration on the activity of enzymes.
d) Define the following:
i) Apoenzyme
ii) Holoenzyme
iii) Ribozymes (4, 4, 4, 3)

Q5 a) What do you mean by Active site of an enzyme? What are the main characteristics of the active site?
b) Discuss Denaturation of proteins with suitable examples.
c) Draw the Fischer Projection and Haworth projection formulae for following:
(i) α -D-glucopyranose
(ii) β -D-fructofuranose
d) Illustrate the specificity and stereo-specificity of enzyme action with suitable examples.
(4, 4, 4, 3)

Q6 Write a short note on any **three** of the following:
a) Reversible Enzyme Inhibition
b) Mutarotation
c) Edman Degradation Method
d) Starch and cellulose
(5 x 3 =15)