

This question paper contains 4 printed pages]

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S. No. of Question Paper : 5742

Unique Paper Code : 3182011101

Name of the Paper : Bio-organic Chemistry

Name of the Course : B.Sc. (H) Biomedical Science (NEP-UGCF)

Semester : I

Duration : 3 Hours

Maximum Marks : 90

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all,

Question No. 1 is compulsory.

Attempt sub-parts of questions together.

Give example and illustrations and Chemical structures wherever required.

1. (a) Define (any four) :

4×2=8

(i) Semi-essential amino acid

(ii) Resolution of Racemic modification

(iii) T_m

(iv) Nucleotide

(v) Isoelectric pH.

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3×4=12

(b) Differentiate (any *three*) :

(i) Reducing sugar and Non-reducing sugar

(ii) Starch and Cellulose

(iii) DNA and RNA

(iv) D and d configuration.

(c) Give the structure of the following (any *five*) :

5×2=10

(i) Dipeptide structure of "Gly-Ala"

(ii) Haworth projection of D-Mannose

(iii) Linoleic acid

(iv) Pseudouridine

(v) Proline

(vi) Meso compound

2. (a) Discuss Acid-Base properties of glycine by providing appropriate reactions. Graphically explain the change in concentration of the different molecular species with change in pH.

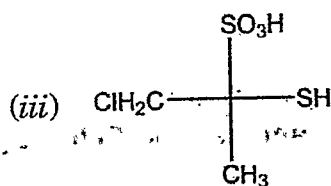
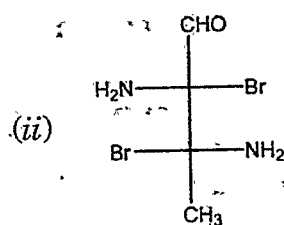
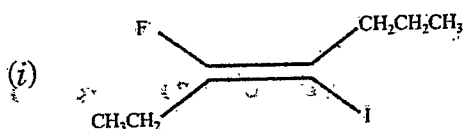
(b) Cyclohexane can exhibit both conformational and geometrical isomerism. Explain the observation taking 1,4 dimethyl cyclohexane as the example.

(c) Discuss why the solution of glucose kept overtime shows a specific rotation of 52.7° . Also in solution, only about 1 percent of the total glucose molecules exist in linear form in which aldehyde group is free to react, yet the glucose solution gives rapid positive test for reducing sugar, why ?

5,5,5

3. (a) The absorption spectrum of nucleic acid has a peak at 260 nm. Explain.
- (b) The polarimetric study of a mixture containing two enantiomers showed that it was optically inactive. Another mixture prepared using the same set of enantiomers was found to be optically active. Explain the observation with suitable example.
- (c) The melting point is much lower for cis-fatty acids compared to trans and saturated fatty acids. Explain with suitable diagrams. 5,5,5
4. (a) Give structure of maltose and explain why it is a reducing sugar.
- (b) What is a β -turn ? Certain amino acids promote formation of β -turns, explain giving structures of amino acid involved.
- (c) Lipids are molecules of choice for storage of metabolic energy. Comment. 5,5,5
5. Giving reaction mechanism and biological relevance of the following reaction (any three) : 5,5,5
- (a) Cannizzaro reaction
- (b) Retro aldol
- (c) Claisen condensation
- (d) Baeyer-Villiger reaction.

6. (a) Give the structure of threo 2, 3 dibromo butyraldehyde. Convert it into Newman projection form.
- (b) Assigning priority order and assign E/Z or R/S configuration to each of the following:



5,10