

This question paper contains 3 printed pages]

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S. No. of Question Paper : 8050

Unique Paper Code : 2173522004

Name of the Paper : DSE : Molecules of Life

Name of the Course : Bachelor of Science (Life Science with
Chemistry/Industrial Chemistry)

Semester : IV/VI

Duration : 2 Hours

Maximum Marks : 60

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

All questions have equal marks.

Attempt any four questions.

1. (a) Write the Fischer structure of aldric acids obtained by the oxidation of D-glucose and D-gulose. How are these aldarcic acids related ?
- (b) You're synthesizing the dipeptide Ala-Tyr. Which protecting groups would you use for :
 - (i) The N-terminus
 - (ii) The C-terminus
- (c) Differentiate between absolute specificity and group specificity
- (d) Draw the structure of a polynucleotide.

4,4,4,3

P.T.O.

2. (a) How will you convert ?
- (i) D-Glucose to D-Arabinose
 - (ii) D-Glucose to D-Fructose.
- (b) Write the classification of amino acids. Give *one* example of each amino acid.
- (c) Write the synthesis of a dipeptide Ala-Ser using t-BOC by solid state synthesis.
- (d) Discuss denaturation of proteins. 4,4,4,3
3. (a) Write the names and reaction of monosaccharides used for the following disaccharide synthesis :
- (i) Sucrose
 - (ii) Maltose (Both anomers).
- (b) What is the structure of lysine at pH = 1.5, 3.2, 9.74 and 12 ? In electrophoresis, to which electrode does lysine migrate at each pH ?
- (c) List *four* important characteristics of the Watson and Crick model of DNA.
- (d) What is the active site of an enzyme ? Explain how an enzyme reaction takes place. 4,4,4,3
4. (a) Explain the hydrogen bonding in the following nucleobases :
- (i) Adenine and Thymine
 - (ii) Guanine and Cytosine.

- (b) Differentiate between any *two* of the following :
- (i) Reducing and non-reducing sugars
 - (ii) Simple proteins and globular proteins
 - (iii) *t*RNA and *m*RNA.
- (c) Give the mechanism of ninhydrin reactions of proteins.
- (d) Draw the structure of Adenosine monophosphate. 4,4,4,3
5. (a) Define the secondary and tertiary structure of protein.
- (b) Give the name and structure of the product when glucose is treated with :
- (i) 5 moles of HIO_4
 - (ii) Bromine water.
- (c) What happens when a freshly prepared aqueous solution of glucose is kept at room temperature for some time ? Give the name of the phenomenon and explain.
- (d) Define epimers and draw the epimers of glucose. 4,4,4,3
6. Write short notes on any *three* of the following :
- (a) Edman Degradation
 - (b) Ruff's degradation
 - (c) Enzyme classification
 - (d) Structure of polynucleotides. 3×5