[This question paper contains 4 printed pages.]

Your Roll No.....

आपका अनुक्रमांक.....

I

Sr. No. of Question Paper : 1094

Unique Paper Code : 2172013502

Name of the Paper : DSC: Nucleic acids, Amino acids, Proteins and Enzymes

Name of the Course : B.Sc. (Hons.) Chemistry

Semester : V

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt four questions in all.
3. All questions carry equal marks.

1. a) How would you differentiate between Gly-Ala and Ala-Gly by Edman's degradation method? Write down the reactions involved.

b) How will you synthesize valine by Gabriels phthalimide method?

c) How will you differentiate between RNA and DNA by alkaline hydrolysis. Give mechanism of the reaction involved.

d) Write structure of NAD^+. Explain its role in an enzyme catalyzed reaction.

e) Discuss the effect of urea and heat on secondary structure of protein. (5x3)

2. a) The reaction of nonapeptide "A" with dansyl chloride gives dansyl derivative of Cysteine. Peptide "A" on reaction with cyanogen bromide gives tripeptide containing Cys, Met, Lys and hexapeptide containing Try, Gly, Ala, Phe, Leu and Asp. Partial hydrolysis of "A" yields Lys-Met-Leu, Ala-Gly-Try, Cys-Lys, Leu-Phe-Ala, Gly-Try-Asp and Met-Leu- Phe. Deduce the structure of "A".

Give all the reactions involved. Write down the products obtained when B is treated with Carboxypeptidase and Chymotrypsin.

b) What are the structures of lysine at pH = 1.5, 3.2, 9.74 and 12? To which electrode does lysine

migrate at each pH? Which of the structure will be present at isoelectric point? (10,5)

3. a) Name the monomers used in preparation of resin used in Solid Phase Merrifield method. How would you synthesize a tripeptide Leu-Ala-Lys by this method? Give its advantages over general method of synthesis.

b) Discuss the following about the Trypsin:

i. Specificity

ii. Catalytic Triad

iii. Pocket at the active site

c) Explain the various types of forces that are responsible for the stabilization of tertiary structures of proteins. (6,6,3)

4. a) Discuss the different types of reversible enzyme inhibition with examples.

b) Explain different classes of enzymes with one example each.

c) What do you understand by K_m in an enzymatic reaction? Discuss its significance. (6,6,3)

5. a) Write the structures showing the hydrogen bonding between the following nucleotide base pairs:

   i. Thymine and Adenine

   ii Guanine and Cytosine

   b) Write short note on the types of RNA and their biological functions.

   c) Discuss the different steps involved in DNA Replication. (5,5,5)

6. Write down short notes on any three of the following:

   a) Electrophoresis

   b) Ninhydrin test

   c) Genetic code

   d) Factors affecting the enzyme activity (5,5,5)