

2/12/19 (M)

[This question paper contains 4 printed pages]

Your Roll No. :

Sl. No. of Q. Paper : **7396** **J**

Unique Paper Code : 32171501

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

Name of the Paper : Organic Chemistry - IV

Semester : V

Time : 3 Hours **Maximum Marks : 75**

Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
- (b) Question No. 1 is compulsory.
- (b) Attempt **six** questions in all.

1. Answer any five of the following : $3 \times 5 = 15$

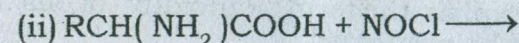
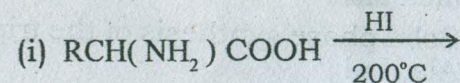
- (a) The sequence ACGTGC (reading in the $5' \rightarrow 3'$ direction) appears on a portion of one strand of DNA. What is the corresponding sequence on the complementary strand of the DNA double helix? Show the polarity of this complementary strand.
- (b) (i) Show which nitrogen atom of histidine heterocycle is basic and which is not.
(ii) Show the structure that results when histidine accepts a proton on the basic nitrogen and then is deprotonated on the other heterocyclic nitrogen.

P.T.O.

- (c) Explain the term "anabolism" and give an example.
- (d) For lysine, the pK_a values of α -carboxyl, the α -amino, and the side chain amino group are 2.2, 9.1 and 10.5 respectively. Write down the structure of lysine at its pI and calculate its pI value.
- (e) Explain the following terms and give an example :
- (i) Bactericide (ii) Bacteriostatic
- (f) What is "iodine number" ? What is its significance ?
2. (a) Convert : 4
- (i) Cytosine \rightarrow 5-Nitrocytosine
- (ii) Urea \rightarrow Uracil
- (b) Give synthesis of Cytosine from malondialdehyde acetal. 4
- (c) Write down the systematic name and structures of : 4
- (i) Cytidine (ii) Guanosine
3. (a) Write the structure and name of coenzyme formed from vitamin Riboflavin .
- (b) Classify the following enzymes according to the type of reaction that they catalyze. Give the first digit of E.C.number.
- (i) Phosphotriose isomerise
- (ii) Phosphofructo kinase
- (c) Differentiate between competitive and noncompetitive inhibition. 4 \times 3=12

4. (a) Give synthesis of Chloramphenicol from p-Nitroacetophenone. Write the name of compound used for resolution.
- (b) (i) Is chloramphenicol bactericide or bacteriostatic ? Explain it through its mode of action.
- (ii) What are antipyretics ? Give an example.
- (c) Vitamine C is required for synthesis of structural protein of skin, connective tissue. Name the protein. Give the name of disease caused by severe deficiency of Vitamine C. 4 \times 3=12

5. (a) Complete the following reactions :



- (b) Treatment of a protein with trypsin gave a peptide 'A' which on complete hydrolysis produced :

Ser, Ala, Gly, Phe, Val, Lys, Asp

Partial hydrolysis of 'A' with Chymotrypsin gave a dipeptide and a pentapeptide. On treatment with sanger's reagent followed by hydrolysis, the dipeptide gave DNP-Asp. The pentapeptide was cycled through Edman's degradation three times. The composition of the peptide remaining after each cycle was as follows :

Cycle 1 : Ala, Lys, Ser, Gly

Cycle 2 : Ala, Lys, Gly

Cycle 3 : Ala, Lys

What is the sequence of amino acids in the heptapeptide ? Explain all the reactions.

4,8

6. (a) Write down two irreversible steps of citric acid cycle .Write all the structures and name of enzymes.
- (b) How is pyruvate converted into lactate under anaerobic conditions ? Write down all the reactions involved .Give the name of enzymes also.
- (c) Give Solid phase synthesis of the tripeptide :
Gly, Ala, Val 4×3=12
7. (a) Explain the term "Rancidity" of oils .How can it be prevented.
- (b) What is acid value of an oil ? What is its significance ?
- (c) How many grams of KOH would be required to neutralise a suspension in water of 250g of fat whose acid value is 40.
4×3=12
8. Write down short notes on any **three** of the following : 4×3=12
 - (i) Allosteric enzymes
 - (ii) Factors affecting enzyme action
 - (iii) Secondary structure of proteins
 - (iv) Electrophoresis