Roll No. ..... Total Pages : 5

GSQ/M-21 **1754**

ORGANIC CHEMISTRY (Theory)

Paper–III (XX-CH-306)

Time Allowed : 3 Hours] [Maximum Marks : 32

Note : Attempt **five** questions in all, selecting **two** questions from each Unit. Question No. **1** is compulsory.

Compulsory Question

1. (i) Write Paal-Knorr synthesis for Furan.

   (ii) Write the resonance structures of Thiophene.

   (iii) Draw the structure of Oxalate ions obtained from Acetylacetone.

   (iv) Out of the Acetone and Diethylmalonate which has more acidic strength and why?

   (v) Write about Zwitter ion structure of α-amino acid.

   (vi) Name two amino protecting groups in Peptide synthesis.

(vii) Name the monomers of :

(a) Nylon-6.

(b) Bakelite.

(viii) Name the most commonly used Ziegler-Natta catalyst. 1×8=8

UNIT–I

2. (a) Write about molecular orbital structure of Pyridine. 2

(b) Write the reaction and mechanism of skraup synthesis of Quinoline. 2

(c) What happens when : 2

(i) Isoquinoline reacts with Sn/HCl ?

(ii) Pyrrole undergoes Gattermann-Koch reaction ?

3. (a) Compare the basicity of Pyrrole, Pyridine and Piperidine. 2

(b) Write mechanism and orientation of Electrophilic substitution in Pyrrole. 2

(c) Write equations for : 2

(i) Chlorination of Indole.

(ii) Oxidation of Isoquinoline.

4. (a) Write the reaction and mechanism for the preparation of Ethyl acetoacetate. 2

(b) From Malonic ester prepare : 3

(i) Iso-valeric acid.

(ii) 1,4-dicarboxylic acid.

(c) Which Alkyl halide is used for the preparation of $C_6H_5CH_2CH_2-\overset{\overset{O}{\|}}{C}-CH_3$ from ethylacetoacetate. 1

5. (a) Comment upon acidic hydrolysis in the synthetic importance of ethylacetoacetate. 2

(b) Prepare : 2

(i) $R-\overset{\overset{O}{\|}}{C}-CH_2COOH$ from malonic ester.

(ii) Succinic acid from ethylacetoacetate.

(c) Write about Keto-Enol tautomerism of ethyl-acetoacetate. 2

UNIT–II

6. (a) Write the general mechanism of Cationic vinyl polymerisation. 2

(b) Write the preparation and uses of : 2

(i) Nylon 66

(ii) Polytetrafluoroethylene.

(c) Write about natural rubber. 2

7. (a) Give preparation and uses of : 2

(i) Bakelite

(ii) Styron.

(b) Arrange the following in increasing order of reactivity in anionic polymerisation : 2

$$CH_2 = CHCH_3 \text{ , } CH_2 = \underset{\displaystyle \underset{\displaystyle \underset{\displaystyle COOC_2H_5}{|}}{C}}{\overset{\displaystyle CH}{|}} \text{ , } CH_2 = CF_2.$$

(c) Define the terms with example : 2

(i) Addition polymerization

(ii) Copolymer.

8. (a) Write equations for the preparation of Amino acids in : 2

(i) Strecker synthesis.

(ii) Gabriel phthalimide synthesis.

(b) Write about solid Phase peptide synthesis. 2

(c) Explain the process of Electrophoresis. 2

9. (a) Classify the Proteins according to hydrolysis products. 2

(b) Write about acid-base behaviour of the Amino acids. 2

(c) Discuss secondary structure of Proteins. 2