

Roll No. ....

Total No. of Pages : 3

**PC 13103-N**

**L-3/2111**

**HETEROCYCLIC CHEMISTRY—323**

**Semester—III**

Time Allowed : Three Hours]

[Maximum Marks : 55

**Note** :- Attempt *five* questions only selecting *two* questions from each of Section A and B. Section C is compulsory.

**SECTION—A**

- I. (a) Discuss the reaction of singlet and triplet nitrene with alkene for the synthesis of aziridine with mechanism. 4
- (b) Explain with the help of two reactions that involve the extrusion of oxygen in oxiranes. 4
- II. (a) Provide two synthetic methods for thitanes with mechanistic details. 4
- (b) Describe the nucleophilic ring opening reactions of azitidine. 4
- III. (a) How to synthesize pyrazole from 1, 3-diketones and imidazole from 1, 2-diketone ? 4
- (b) Write the product and mechanism of nitration of 2-methyl imidazole and 1-methyl pyrazole. 4

- IV. (a) Describe the chemical properties of oxazole and isoxazole. 4  
(b) Differentiate between the physical properties of thiazole and isothiazole. 4

#### SECTION—B

- V. (a) Outline the most useful synthetic approaches to pyridazine and pyrazine. 4  
(b) Discuss various chemical reactions of oxazine. 4½
- VI. How to carry out the following conversion ? Discuss two examples of each with mechanism :
- (i) Quinolone to indole  
(ii) Dihydrofurans to cyclopropyl ketone. 8½
- VII. (a) Explain how pyrrole is transformed to pyridine ? 4  
(b) Provide the route for the synthesis flavonol from benzylidene coumaranones. 4½
- VIII. (a) Discuss 1, 2-rearrangement during Clemmenson's reduction. 4½  
(b) Explain Jacobsen rearrangement in details with importance. 4

#### SECTION—C

- IX. (a) Give the mechanism of extrusion of sulphur in thirane.  
(b) How oxitane is prepared ?  
(c) Write the product(s) of reaction between  $C_6H_5COCH_2COCH_3$  and phenylhydrazine.

- (d) Write the product(s) of reaction between  $\alpha$ -haloketone and thioacetamide.  
(e) How isothiazole is prepared ?  
(f) How parent pyrimidine is synthesized ?  
(g) Outline the theoretical approaches for the synthesis of 1, 3-oxazine.  
(h) How ring contraction of dihydrofuran is carried out ?  
(i) Provide a synthetic approach to flavone.  
(j) Discuss 1, 2-rearrangement in catechin.  
(k) Provide an example of aromatic rearrangement in benzidine.

2×11=22