

**K-5/2110**

**7407/N**

**HETEROCYCLIC CHEMISTRY-323  
(SEMESTER-3<sup>rd</sup>)**

**Maximum Marks: 55  
Time allowed: 2 Hours**

**Note: Attempt any four questions. All questions carry equal marks.**

Q. 1 Describe the “Cyclization Method” and “Methylene Insertion Reaction” protocols for the synthesis of following heterocycles with appropriate examples & their mechanisms

- (a) Aziridines **7 marks**  
(b). Thiiranes **6.75 marks**

Q. 2 (a) Explain at least two methods for the preparations of Oxetanes by taking examples. **6.75 marks**  
(b). Discuss the Electrophilic and Nucleophilic Ring Opening Reactions of Thitanes. **7 marks**

Q. 3 Describe the Synthetic Methods and Chemical Reactions of Oxazoles by taking suitable examples and their mechanisms. **13.75 marks**

Q. 4 Explain the Electrophilic and Nucleophilic Substitution Reactions of following heterocycles with suitable examples:

- (a) Imidazoles **5 marks**  
(b) Isothiazoles **4.75 marks**  
(c). Pyrazoles **4 marks**

Q. 5 (a) Describe at least three methods for the synthesis of Pyridazines with examples. **7 marks**  
(b). What are Pyrazines? Explain the method of their preparations with examples. **6.75 marks**

Q. 6 (a) Discuss the various Synthetic Approaches and Chemical Reactions of 1, 3-Oxazines with appropriate examples. **6.75 marks**

Q. 7 (a) Describe the mechanism of “Alkyl group migration during Fisher’s Indole Synthesis”. with at least three examples. **7 marks**  
(b). Elaborate the Rearrangement of “N-substituted Aniline” by taking examples and their mechanisms. **6.75 marks**

Q. 8 Discuss the mechanism of following Rearrangements with suitable examples:

(a) Pyridine to Pyrrole **5 marks**

(b) Tetrahydro furfuryl alcohol to Dihydropyran **4 marks**

(c). 1,2-Rearrangement in Catechin derivatives **4.75 marks**

Q. 9 (a) Usually three membered heterocycles are prepared easily as compared to four membered heterocycles. How will you justify this observation with the help of suitable reason? **5 marks**

(b) Comment upon the Aromatic and Basic characters of three types of Diazines by taking appropriate examples. **4 marks**

(c). Which of the following heterocycles will exhibit better reactivity towards the Bromination Reactions ( $\text{Br}_2/\text{AcOH}$ ):

(i) 2-methyl imidazole

(ii) 5-methyl imidazole

**4.75 marks**