



THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions: (6x5=30)

- i. In pyridinium oxide, the most favorable position towards attack of an electrophile as well as nucleophile is γ -carbon. How would you justify this statement?
- ii. Propose a suitable mechanism for the Hantzsch synthesis of pyridine ring.
- iii. Describe the role of furan as a diene in Diels Alder reaction with suitable examples.
- iv. The neighboring provides anchimeric assistance to a leaving group in a rearrangement reaction when needed? Explain with the help of examples.
- v. Draw the complete mechanism of Baeyer-Villiger rearrangement.
- vi. Propose a mechanism that shows why p-chlorotoluene reacts with sodium hydroxide at 350 °C to give a mixture of p-cresol and m-cresol.

Answer the following questions.

Q. No. 2 i. Describe chichibabin reaction and its mechanism? (5)

ii. Arrange the following in order of reactivity towards aromatic electrophilic substitution reaction? Explain your answer. (5)

- i. Benzene ii. Pyrrole iii. Furan iv. Thiophene

Q.No. 3 Design synthesis involving rearrangement reaction for the following compounds.

Write the name of rearrangement and draw the mechanisms.(10)

a) Pinacolone

b) Hexanamine

Q.No. 4 In an aqueous solution containing sodium bicarbonate, aniline reacts quickly with bromine to give 2,4,6-tribromoaniline. Nitration of aniline requires very strong conditions, however, and the yields (mostly m-nitroaniline) are poor. (a) What conditions are used for nitration, and what form of aniline is present under these conditions? (b) Explain why nitration of aniline is so sluggish and why it gives mostly meta substitution. (c) Although nitration of aniline is slow and gives mostly meta substitution, nitration of acetanilide goes quickly and gives mostly para substitution. Use resonance forms to explain this difference in reactivity. (10)