

**ADVANCED ORGANIC CHEMISTRY - I**

**M. Pharm 1<sup>st</sup> Year 1<sup>st</sup> Semester Examination 2025**

**Full Marks: 75**

Answer any five questions by taking *at least two* from each group.

**Group A**

1. Write principle, mechanism and applications of *any one* the following name reactions: [15]
  - a. Ullmann-Coupling Reaction
  - b. Ugi Reaction
2. Write principle and mechanism of *any two* of the following name reactions: [7.5x2]
  - a. Dieckmann Reaction
  - b. Mitsunobu reaction
  - c. Shapiro & Suzuki reaction
3. Write notes on (**any four**): [4 x 5]
  - a) Skraup Quinoline Synthesis
  - b) Fischer Indole Synthesis
  - (c) Paal-Knorr Synthesis of Pyrrole
  - d) Hantzsch pyridine synthesis
  - e) Fiest-Benary synthesis
  - f) Carbenes and Nitrenes
4. Write various condensation reactions of Furfural. Explain why Pyridine is more basic than pyrrole but less basic than aliphatic amines. Pyrrole undergoes electrophilic substitution reaction at 2 position-why? [6+5+4]

**Group B**

5. What is a protecting group? Discuss the ideal properties of a protecting group, including its advantages and disadvantages in organic synthesis. Write down the different protection strategies for carbonyl and carboxyl compounds. [2+5+8]
6. Why is protection strategy necessary for the synthesis of peptides? Discuss with examples. Describe different methods of protection and deprotection of OH group of alcohol. [5+ 10]
7. Write synthesis and applications of following reagents (**any three**)
  - (a) Dicyclohexylcarbodiimide (b) N-bromosuccinamide (c) Wilkinson reagent (d) Diazomethane (e) Osmium tetroxide. [5 x 3]
8. What is Retrosynthesis? Discuss its objectives and goals. Discuss the principle and common strategies followed in the case of Retrosynthesis. [2+4+9]