

**School of Basic Sciences****Bachelor of Science Honours in Chemistry  
Semester End Examination - Jun 2024****Duration : 180 Minutes  
Max Marks : 100****Sem IV - C1UB404B - Heterocyclic Chemistry***General Instructions**Answer to the specific question asked**Draw neat, labelled diagrams wherever necessary**Approved data hand books are allowed subject to verification by the Invigilator*

- |     |  |        |
|-----|--|--------|
| 1)  | Define the term monoterpene and sesquiterpene.   | K1(3)  |
| 2)  | Explain sulphonation reaction of aniline with mechanism.   | K2(4)  |
| 3)  | Explain the role do alkaloids play in the defense mechanisms of plants and animals.  | K2(6)  |
| 4)  | Illustrate the carbylamine reaction with mechanism   | K3(6)  |
| 5)  | Illustrate the How does pyridine behave as a base compared to other common bases like ammonia or triethylamine.                          | K3(6)  |
| 6)  | Illustrate the electrophilic substitution reactions of thiophene such as halogenation, nitration and sulphonation with proper mechanism. | K3(9)  |
| 7)  | Illustrate the electrophilic substitution reactions of pyridine such as halogenation, nitration and sulphonation with proper mechanism.  | K3(9)  |
| 8)  | Analyze the chemical reactions of furan and pyrrole.   | K4(8)  |
| 9)  | Analyze the electrophilic substitution reactions of thiophene.   | K4(12) |
| 10) | Examine the synthesis of $\alpha$ -terpineol.  | K5(10) |
| 11) | Examine the Fischer indole synthesis with mechanism.   | K5(15) |
|     | <b>OR</b>  |        |
|     | Examine the Knorr quinoline synthesis.   | K5(15) |
| 12) | Discuss the Birch reduction of naphthalene with mechanism.   | K6(12) |
|     | <b>OR</b>  |        |
|     | Elaborate the Haworth synthesis of naphthalene with mechanism.   | K6(12) |