

November 2025
M.Sc.
Third Semester
DISCIPLINE SPECIFIC ELECTIVE – 02
CHEMISTRY
Course Code: MCHD 3.21
(Natural Products & Bioorganic Chemistry)

Total Mark: 70
Time: 3 hours

Pass Mark: 28

Answer five questions, taking one from each unit.

UNIT-I

1. (a) Write the biosynthesis pathway of fatty acids and their derivatives. 10
- (b) Write the biogenesis synthesis of *cis*-jasmone. 4
2. (a) Write the synthesis of natural muscone by the Kamat method. 8
- (b) Discuss the biosynthesis of alkaloids with emphasis on nicotine. 6

UNIT-II

3. (a) Explain the mode of enzyme action and characteristics of the active site of an enzyme. 6
- (b) Explain the factors that affect enzyme activity. 8
4. (a) Write the structure and function of the following: 5×2=10
- (i) NADH (ii) FAD
- (b) Write the characteristics of enzymes. 4

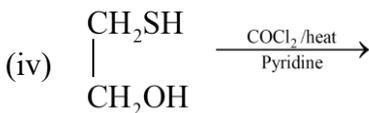
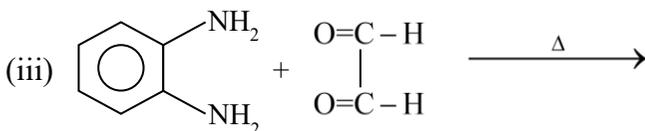
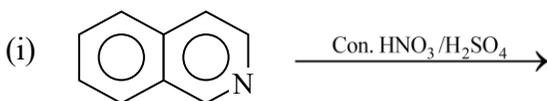
UNIT-III

5. (a) Establish the structure of morphine. Give its synthesis and bio-synthesis. 11
- (b) Explain Hoffmann's exhaustive methylation method for degradation of alkaloids. 3

6. (a) Establish the structure of strychnine. Give its synthesis and biosynthesis. 12
 (b) Write Zeisel method for estimation of alkoxy group. 2

UNIT-IV

7. (a) Write Hassner's synthesis for the preparation of azirane. 4
 (b) Write a short note on the Skraup synthesis for preparation of quinoline. 3
 (c) In the electrophilic substitution reaction of quinoline substituent enters at benzene ring at position C-5 and C-8. Explain. 5
 (d) Write any one method for the preparation of thiirane. 2
8. (a) Write any two methods for the preparation of thiiranes. 2+2=4
 (b) Complete the following reactions: 6



- (c) Write any two methods for the preparation of phenothiazine. 2+2=4

UNIT-V

9. (a) Write short notes on the isolation and purification of terpenoids. 3
- (b) Write the biosynthesis of chrysanthemic acid and cyclo-pentatomonoterpene lactones. 4+4=8
- (c) What are sesquiterpenes? Write the general biosynthetic pathway of sesquiterpenes. 1+2=3
10. (a) Write a short note on each of the following: 2×2=4
- (i) Diterpenes
- (ii) Special isoprene rule
- (b) Explain the chemical synthesis of thujopsene and illustrate its arrangement reactions with examples. 10
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