2023

M.Sc.

Third Semester

DISCIPLINE SPECIFIC ELECTIVE – 02

CHEMISTRY

Course Code: MCHD 3.21

(Natural Products & Bioorganic Chemistry)

Total Mark: 70 *Pass Mark: 28*

Time: 3 hours

Answer five *questions, taking* one *from each unit.*

UNIT–I

1. (a) What is biosynthesis? Discuss the biosynthesis of palmitic acid. 1+6=7

   (b) What is biogenesis? Discuss the biogenesis of cis-jasmone and mention its characteristics. 7

2. (a) What are natural product? Discuss their types with examples. 4

   (b) Discuss the classification of secondary metabolites. 6

   (c) Give the synthesis of muscone and mention its characteristics. 4

UNIT–II

3. (a) What are enzymes? Give their nomenclature with examples. 6

   (b) Discuss transition state theory and Fischer's lock and key theory of enzyme action. 4+4=8

4. (a) Give the structure and function of the following: 5×2=10

   (i) NADH (ii) FAD

   (b) Discuss the characteristics of enzyme and its selectivity. 4

UNIT–III

5. (a) Establish the structure of lysergic acids. Give its synthesis. 8

   (b) Explain Hoffmann exhaustive methylation method for degradation of alkaloids. 4

(c) Write Herzig-Meyer method for estimation of N-alkyl group. 2

6. (a) Establish the structure of morphine. Give its synthesis. 10
   (b) Write biosynthesis of morphine. 4

UNIT–IV

7. (a) Write three methods for preparation of azirane. 3×2=6
   (b) Write any two processes for the preparation of oxetanes. 5
   (c) Azetidines are less reactive than azirane towards ring opening reactions. Explain. 3

8. (a) Write Skraup synthesis with mechanism for the preparation of quinoline. 4
   (b) Quinoline gives electrophilic substitution reactions preferentially at C-5 and C-8 position. Explain with resonating structures. 6
   (c) Write Fischer indole synthesis with mechanism. 4

UNIT–V

9. (a) How are terpenes extracted from essential oils? 4
   (b) Give the introduction and synthesis of the following compounds: 5×2=10
      (i) Cis-juvenile hormone
      (ii) Trans-chrysanthemic acid

10. (a) What is thujopsene? Give its synthesis. 1+4=5
    (b) How does thujopsene produces the following compounds by rearrangement reaction? 3×3=9
      (i) Widdrol
      (ii) Homoallylic-alcohol
      (iii) Bicyclic-dienol