

May 2025
M.Sc.
Fourth Semester
DISCIPLINE SPECIFIC ELECTIVE – 03
CHEMISTRY
Course Code: MCHD 4.11 (B)
(Applied Organic Chemistry)

Total Mark: 70
Time: 3 hours

Pass Mark: 28

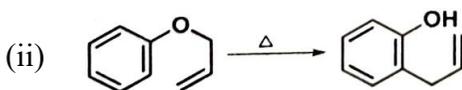
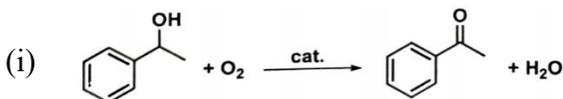
Answer five questions, taking one from each unit.

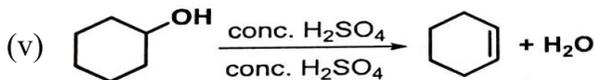
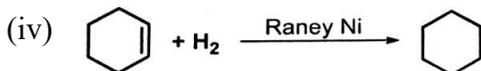
UNIT-I

1. (a) Explain the concept of pollution prevention and describe its importance in environmental management. 6
(b) Write a note on toxicity of arsenic and lead in environment. 4+4=8
2. (a) Explain the process of bioremediation in soil remediation. Discuss its advantages and disadvantages. 6
(b) Discuss the process of fluoride removal from contaminated water. 4
(c) Write a note on industrial waste management. 4

UNIT-II

3. (a) Elaborate with examples the three categories of microwave-assisted organic reactions. 6
(b) Calculate the percentage atom economy for the following reactions. 5





- (c) What are the limitations in the pursuit of green chemistry? 3
4. (a) Provide the greener route on synthesizing carbaryl with mechanisms and contrast it to the conventional synthetic procedure. 6
- (b) Explain the importance of ultrasonic irradiation in organic transformation. Discuss the advantages of carrying out reaction under ultrasonic irradiation over classical method with suitable examples. 2+3=5
- (c) Why is green chemistry called sustainable chemistry? 3

UNIT-III

5. (a) Write the mechanism for cationic polymerisation reaction. 3
- (b) Explain the term polydispersity index. Calculate polydispersity index, number average molecular mass and weight average molecular mass for a polymer sample with 30% molecules have a molecular mass 20,000, 40% have molecular mass 30,000, and rest have 60,000. 2+5=7
- (c) Explain copolymerisation reaction. 4
6. (a) Write characterisation of polymer for synthesis of new polymer. 5
- (b) Explain how a polymer structure can affect the chemical, mechanical, electrical, and optical properties of polymer. 5
- (c) Explain types of polymer degradation. 4

UNIT-IV

7. (a) Briefly discuss the interaction between drug molecules and receptor sites. 5

- (b) Write a note on quantitative structure-activity relationship (QSAR). 5
- (c) What are the factors affecting mode of drug absorption and elimination? 4
8. (a) Discuss the mechanism of drug action in detail. 8
- (b) Elaborate the function of prodrugs and soft drugs. 6

UNIT-V

9. Write the biosynthesis of guanine base with suitable steps. 14
10. (a) Explain the structure of RNA and function of different types of RNA. 6
- (b) Write the structure of adenosine and uridine. 4
- (c) Explain the replication of DNA. 4
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