

**2022**  
**B.A./B.Sc.**  
**Fourth Semester**  
 CORE – 9  
**CHEMISTRY**  
*Course Code: CHC 4.21*  
 (Organic Chemistry – III)

*Total Mark: 70*  
*Time: 3 hours*

*Pass Mark: 28*

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

**UNIT-I**

1. (a) Write short notes on: 3×2=6
- (i) Hoffmann exhaustive methylation of amine
- (ii) Gabriel phthalimide synthesis of amine
- (b) Aniline is less basic than methyl amine. Explain. 3
- (c) Write the distinction between primary, secondary and tertiary amines with nitrous acid. 5
2. (a) Write short notes on: 3×2=6
- (i) Hoffmann bromamide reaction
- (ii) Mannich reaction
- (b) Complete the following reactions: 6
- (i)  $\text{CH}_3\text{OH} + \text{NH}_3 \xrightarrow{\text{Al}_2\text{O}_3 \text{ Heat}} ?$
- (ii)  $\text{CH}_3\text{COCl} + \text{CH}_3\text{NH}_2 \longrightarrow ?$
- (iii)  $\text{CH}_3\text{CN} \xrightarrow{\text{LiAlH}_4} ?$
- (iv)  $\text{CH}_3\text{CH}_2\text{NO}_2 \xrightarrow{\text{LiAlH}_4} ?$
- (c) Write the preparation of benzenediazonium chloride. 2

## UNIT-II

3. (a) Describe how the structure of naphthalene has been established. 7  
(b) Explain why electrophilic substitution in naphthalene takes place mainly at  $\alpha$ -position. 4  
(c) Write the reaction for Friedel-Crafts acylation of naphthalene. 3
4. (a) Describe how the structure of anthracene has been established. 7  
(b) Write two preparations of anthraquinone. 5  
(c) Anthracene is less aromatic than benzene. Why? 2

## UNIT-III

5. (a) Explain *any two* of the following with reactions:  $5 \times 2 = 10$   
(i) Bischler-Napieralski synthesis of isoquinoline  
(ii) Fischer indole synthesis  
(iii) Knorr pyrrole synthesis  
(b) Explain why pyridine undergoes nucleophilic substitution at 2-position. 3  
(c) What are heterocyclic compounds? 1
6. (a) Explain the electrophilic substitution reaction of pyrrole. 3  
(b) Explain the following reactions:  
(i) Skraup synthesis 4  
(ii) Hantzsch pyridine synthesis 5  
(c) How will you convert furan into pyrrole? 2

## UNIT-IV

7. (a) Establish the structure of nicotine. Give its synthesis.  $6+2=8$   
(b) What is Emde degradation? Illustrate with one example. 3  
(c) Write a note on determination of -OMe group in an alkaloid. 3
8. (a) Establish the structure of hygrine. Give its synthesis.  $6+2=8$   
(b) Explain Hoffmann elimination reaction with suitable example. 4  
(c) Give the medicinal use of morphine. 2

## UNIT-V

9. (a) Establish the structure of citral. Give its synthesis. 6+3=9  
(b) Explain geometrical isomerism of citral. 3  
(c) Write the characteristics for a compound to be called terpenoid. 2
10. (a) Establish the structure of  $\alpha$ -terpineol. Give its synthesis. 6+3=9  
(b) Write the conversion of nerol to  $\alpha$ -terpineol. 2  
(c) Write the classification of terpenes. 3
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