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Reg. No. :

Code No. : 20064 E Sub. Code : CMCH 62

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2025.

Sixth Semester

Chemistry — Core

ORGANIC CHEMISTRY – III

(For those who joined in July 2021 and 2022 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The catalyst used in Knoevenagel reaction is _____.
- (a) AlCl_3
 - (b) Cyanide ion
 - (c) Weak base like piperidine
 - (d) Strong mineral acid

2. The functional groups present in mandelic acid are _____.
- (a) $-\text{OH}$ and $-\text{COOH}$
 - (b) $-\text{CHO}$ and $-\text{COOH}$
 - (c) $-\text{COOH}$ and $-\text{NH}_2$
 - (d) $-\text{OH}$ and $-\text{CHO}$
3. The pinacol-pinacolone rearrangement is an example of _____.
- (a) Nucleophilic substitution
 - (b) Electrophilic substitution
 - (c) Free radical substitution
 - (d) Molecular rearrangement
4. The reagent commonly used in Hofmann rearrangement is _____.
- (a) HCl/ZnCl_2
 - (b) $\text{Br}_2 + \text{NaOH}$
 - (c) SOCl_2
 - (d) HNO_3

5. Anthracene on reduction with Zn/HCl give
- Naphthalene
 - Benzene
 - 9, 10-dihydroanthracene
 - Phenanthrenes
6. Dyes containing the $-N=N-$ group are called _____
- Vat dyes
 - Indigo dyes
 - Azo dyes
 - Triphenylmethane dyes
7. Alkaloids are classified based on
- Botanical source
 - Heterocyclic ring system
 - Pharmacological activity
 - All of these
8. α -Terpineol is _____.
- A monoterpene alcohol
 - A monoterpene aldehyde
 - A monoterpene ketone
 - A diterpene
9. $-OH$ group attached to a chromophore is an example of _____.
- Chromophore
 - Auxochrome
 - Free radical
 - Carbonyl
10. According to Woodward-Fischer rules, the base value for an open-chain conjugated diene is _____.
- | | |
|------------|------------|
| (a) 200 nm | (b) 253 nm |
| (c) 217 nm | (d) 214 nm |

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write the preparation of Cresol and Catechol.
- Or
- (b) Write a note on the Gattermann aldehyde synthesis.

12. (a) Write a short note on Beckmann rearrangement.

Or

- (b) Explain the Curtius rearrangement with mechanism.

13. (a) Explain the synthesis of anthracene.

Or

- (b) Write a note on preparation and uses of indigo dyes.

14. (a) Discuss the structural elucidation of piperine.

Or

- (b) Define terpenes. Mention their classification.

15. (a) Distinguish between red shift and blue shift in UV spectroscopy.

Or

- (b) Define and explain the term Spin-spin coupling in NMR spectroscopy with suitable examples.

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PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write the mechanism of the Reimer-Tiemann reaction and Cannizzaro reaction.

Or

- (b) Discuss the preparation and uses of benzene-1, 2-dicarboxylic acid and benzene-1, 4-dicarboxylic acid.

17. (a) Explain the mechanism of Fries rearrangement and Claisen rearrangement.

Or

- (b) (i) Describe the mechanism of Baeyer-Villiger oxidation.
(ii) What is the Dakin reaction? Give an example.

18. (a) Write notes on the electrophilic substitution reactions of naphthalene.

Or

- (b) Describe the preparation and uses of methyl orange and Phenolphthalein.

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19. (a) Describe the synthesis and structural elucidation of Conine.

Or

- (b) Explain the synthesis and structural elucidation of α -terpineol.
20. (a) How is IR spectroscopy useful in the detection of functional groups?

Or

- (b) Describe how NMR spectroscopy helps in the structural elucidation of simple organic compounds with examples.
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