

**THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024****(Regular/Improvement/Supplementary)****CHEMISTRY: Complementary Course for Physics, Botany and Zoology****GCHE3C03T: ORGANIC CHEMISTRY****Time: 2 Hours****Maximum Marks: 60****SECTION A: Answer the following questions. Each carries *two* marks.****(Ceiling 20 marks)**

1. Draw the structure of the alkaloid nicotine.
2. What do you mean by vulcanization?
3. Illustrate Friedel-Crafts acylation using an example.
4. What product will you get when prop-2-en-1-ol is treated with PCC in dichloromethane?
5. Define inductive effect. Name one group each for +I effect and –I effect.
6. Draw resonance structure of nitrobenzene.
7. Differentiate between activating groups and deactivating groups using an example for each.
8. Draw the two important conformations of cyclohexane. Explain their stability.
9. Illustrate Fitting reaction with an example.
10. Discuss Hoffmann's bromamide reaction.
11. What are essential oils?
12. Which is more easily esterified with ethanol in presence of HCl – benzoic acid or 2,4,6-trimethyl benzoic acid? Justify.

**SECTION B: Answer the following questions. Each carries *five* marks.****(Ceiling 30 marks)**

13. State Hückel's rule of aromaticity. Explain the aromaticity of (i) naphthalene (ii) pyridine using the rule.
14. Discuss the optical isomerism of lactic acid.
15. Differentiate between DNA and RNA.
16. Describe a method of preparation of methyl orange. What is its use?
17. Discuss any two methods for distinguishing fumaric acid from maleic acid.
18. Explain the terms (i) anomers (ii) mutarotation.
19. Arrange  $\text{NH}_3$ ,  $\text{CH}_3\text{NH}_2$ ,  $(\text{CH}_3)_2\text{NH}$ , and  $(\text{CH}_3)_3\text{N}$  in decreasing order of their basicity. Explain the theoretical basis of your answer.

**SECTION C: Answer any *one* question. The question carries *ten* marks.**

20. Discuss and illustrate the significance of various electron displacement effects in organic molecules.
21. Discuss the mechanism, kinetics and stereochemistry of  $\text{S}_{\text{N}}1$  and  $\text{S}_{\text{N}}2$  reactions.

**(1 × 10 = 10 Marks)**