24U3125 (Pages: 2) Name : .....

Reg. No : .....

THIRD SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2025

(FYUGP)

CC24UCHE3MN206 - APPLIED ORGANIC CHEMISTRY

(Chemistry - Minor Course)

(2024 Admission - Regular)

Time: 2.0 Hours Maximum: 70 Marks

Credit: 4

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 3 marks.

1. Mention the different types of molecular energy levels. [Level:2] [CO1]
2. Mention one use of NMR spectroscopy in the identification of simple organic molecules. [Level:2] [CO1]
3. What is meant by red shift (bathochromic shift)? [Level:2] [CO1]
4. Why is the $–NO_2$ group meta-directing in aromatic substitution reactions? [Level:2] [CO2]
5. What is the electrophile generated during the nitration of benzene? [Level:2] [CO2]
6. Define benzenoid and nonbenzenoid aromatic compounds with one example each. [Level:2] [CO2]
7. Discuss the advantages and disadvantages of using chemical names over generic names in clinical practice [Level:2] [CO3]
8. Define the term prodrug with one example. [Level:2] [CO3]
9. Write the formula for calculating Rf value and state its significance. [Level:2] [CO5]
10. Define retention factor (Rf) in thin layer chromatography (TLC) and state its significance [Level:2] [CO5]

(Ceiling: 24 Marks)

Part B (Paragraph questions/Problem)

Answer ***all*** questions. Each question carries 6 marks.

11. Discuss the different types of electronic transitions observed in molecules. [Level:2] [CO1]
12. Explain briefly the factors affecting absorption frequencies in IR spectroscopy. [Level:2] [CO1]
13. Discuss the effect of substitution on the λmax of conjugated butadienes [Level:2] [CO1]

14. Discuss the selection rules of (a) Electronic spectroscopy (b) Infra red spectroscopy [Level:2] [CO1]

15. Explain different types of isomerism possible in disubstituted benzene derivatives with suitable examples. [Level:2] [CO2]

16. What are antibiotics? What is meant by broad spectrum antibiotic and narrow spectrum antibiotic? Give examples. [Level:2] [CO3]

17. Describe the synthesis of aspirin with a suitable chemical equation. [Level:2] [CO3]

18. Write the method of purifying certain organic solids by sublimation. [Level:2] [CO5]

(Ceiling: 36 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 10 marks.

19. Write an essay on NMR spectroscopy covering introduction, chemical shift, and spin–spin coupling. [Level:2] [CO1]

20. Definition and examples of the following: Tranquilizers, Narcotics, Antidepressants, and Psychedelic drugs. [Level:2] [CO3]

(1 × 10 = 10 Marks)

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