M.Sc. DEGREE EXAMINATION,NOVEMBER 2019
II Year III Semester
Organic Chemistry - III

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. What is fundamental vibrations and overtones?
2. What are stoke's and antistoke's lines?
3. What are auxochrome? Give an example,
4. Define Hyperchromic effect.
5. Describe the coupling constant.
6. What do you know about magnetically non-equivalent proton?
7. Define Off-Resonance decoupling.
8. Explain the reference used in 13_C NMR.
9. What do you understand by Nitrogen rule?
10. Define Metastable peak.
11. Explain the intensity of Raman lines.
12. State the Frank-Condon principle.

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Explain the significance of fingerprint region in IR.
14. Discuss the effect of steric hindrance to coplanarity in UV spectra.
15. How will you distinguish cis and trans-stilbene using NMR spectroiscopy?
16. Explain the Noise decoupling for 13_C NMR spectra.
17. Discuss the McLafferty rearrangement with an example.
18. How will you differentiate inter and intra molecular hydrogen bonding using IR?
19. Discuss the mass spectrum of anisole.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Distinguish between the following pairs of compounds with the help of infra-red technique. i) cis and trans-cinnamic acid ii) propanal and propanone

21. Discuss the UV spectrum of conjugated cyclic ketones and esters.

22. Write brief notes on the following
(a) chemical shift (b) spin-spin coupling (c) NOE

23. (a) A hydrocarbon containing 85.7% carbon and 14.3% hydrogen is transparent above 210 mμ in UV spectrum. In this IR bands are formed at (i) 3022 (m) 1676 (m) and at 965cm$_1$ (s). Two signals appears in its NMR spectrum (i) 8.40 τ doublet and (ii) 4.45 τ quartet in the integral area ratio as 3:1 respectively. Determine the Structural formula of the compound.
(b) A compound of molecular formula $C_6H_{12}O_2$ Shows the following signals in NMR
i) Singlet 1.1 δ(6H), Singlet 2.1 δ(3H)
ii) Singlet 2.6 δ(2H), Singlet 3.9 δ(1H) Determine the Structure of the compound.

24. (a) Predict the fragmentation pattern of diphenyl ether.
(b) How would you distinguish among o-, m-, p-dimethoxybenzenes on the basis of mass spectrometry?

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