SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
M.Sc. END SEMESTER EXAMINATION APRIL/NOV - 2021
SEMESTER - III
20PCHCT3007 - Organic Chemistry - III

Total Duration : 3 Hrs		**Total Marks : 75**	
MCQ	: 30 Mins	MCQ	: 15
Descriptive	: 2 Hrs.30 Mins	Descriptive	: 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. How IR spectroscopy can be used to determine the molecular formula of a compound? Illustrate with an example.
2. Give an account of Woodward- Fieser rules.
3. Apply the IR and Raman spectra in the determination of organic compounds.
4. Discuss how acetone and methyl acetate are identified by ^{1}H NMR and ^{13}C NMR.
5. Explain the mechanism of McLafferty rearrangement.
6. Arrive the solvent effect (dielectric constant)on the electronic transitions in benzophenone and naphthalene?
7. Relate NMR and NQR.
8. Suggest the structure of a compound with molecular formula $C_{10}H_{12}O$ whose mass spectrum shows peaks at (m/z) 15, 43, 77, 91, 105, and 148.

Section C

Part A

Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. (i) Explain why trans stilbene has higher λ max value than cis stilbene? (5)
   (ii) What are the factors affecting the stretching frequency? Explain. (5)
10. Discuss in details the chemical shift and spin-spin splitting in NMR spectroscopy.
11. (i) Explain the fragmentation pattern of alcohols and carbonyl compounds. (6)
    (ii) Describe the applications of ^{13}C NMR spectra. (4)
12. Give brief account of the following terms
    (i) Chemical exchange (ii) shift reagents
    (iii) ring rule (iv) coupling constant (4x2.5)

Contd...

Part B

Compulsory question $(1 \times 10 = 10$ Marks)

13. Assign the structure and justify your answer for the compound,C9H10O2 with the following data
    UV: λ max:271nm IR:γ=1680cm^{-1}
    ^{1}HNMR:δ 7.7(d,J=8Hz,2H),6.8(d,J=8Hz,2H),3.9(s,3H),2.4(s,3H)
    EIMS:m/z 150,135,107 and 43.