



Date: 07-11-2016

Dept. No.

Max. : 100 Marks

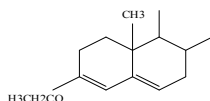
Time: 09:00-12:00

PART- A

Answer ALL questions

(10 x 2 = 20)

1. Mention the type of electronic transitions found in Methyl vinyl ketone.
2. Define resolution.
3. What is the effect of auxochrome in UV spectrum?
4. Calculate the λ_{\max} value of the following compound when the trans butadiene absorbs at 214 nm.



5. What is mutual exclusion principle?
6. KBr is used to make sample pellet in IR spectroscopy. Why?
7. Why is tetramethyl silane used as a reference in NMR?
8. What is coupling constant?
9. Define nitrogen rule.
10. What is ortho effect?

PART- B

Answer any EIGHT questions

(8 x 5 = 40)

11. Write notes on absorption and emission spectra.
12. (i). What do you mean by selection rule in spectroscopy? (2)
(ii). Draw an energy level diagram showing various molecular energies. (3)
13. Three isomeric compounds X, Y and Z with molecular formula C_5H_6 absorb three moles of hydrogen on catalytic reduction to give n- pentane. Y and Z give white precipitate when passed through ammoniacal silver nitrate but X does not react with it. X and Y show an absorption maximum beyond 200 nm. Identify X, Y and Z.
14. Describe the instrumentation of photocalorimeter with block diagram.
15. Explain the types of vibration in the IR spectrum of CO_2 .
16. Differentiate between IR and Raman spectroscopy.
17. Write notes on Rayleigh and Raman scattering.
18. What is chemical shift? Mention the factors which affect chemical shift.

19. (i). An organic compound with molecular formula $C_3H_3Cl_5$, gave the following pmr data.

a. A triplet at 4.52 δ

b. A doublet at 6.07 δ

Assign a structural formula to the compound which is consistent with its pmr data given above.

(ii). Mention the rules used in the splitting of signals with an example.

20. Mention the applications of NMR spectroscopy.

21. How will you determine the structure of ethanol using mass spectra?

22. Discuss the factors which influence fragmentation in mass spectrometry.

PART- C

Answer any FOUR questions

(4 x10 = 40)

23. Describe the principle, instrumentation and applications of flame photometry.

24. Discuss the factors governing absorption maximum and intensity.

25. Enumerate the instrumentation with block diagram of IR spectrometer.

26. (i). Mention the applications of mutual exclusion principle.

(ii). Differentiate CH_3CH_2CHO and $CH_2 = CH CH_2OH$ using IR spectra.

27. Explain the principle and instrumentation of NMR spectroscopy.

28. Describe the principle and instrumentation of mass spectrometry.
