

9. (a) (i) Explain the instrumentation of EPR spectra.

(ii) Give any four application of EPR. (4 + 6)

Or

(b) (i) Explain Mossbauer application in iron carbonyls and iron proteins.

(ii) Explain Mossbauer effect. (7 + 3)

10. (a) (i) Explain the advantages of PAS.

(ii) Discuss the application of PAS.

Or

(b) (i) Differentiate o-xylene, m-xylene and p-xylene with ^1H -NMR.

(ii) Differentiate inter and intra molecular H-bonding in ^1H -NMR and IR. (5 + 5)

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17PCHE03

(For the candidates admitted from 2017–2018 onwards)

M.Sc. DEGREE EXAMINATION, APRIL/MAY 2018.

Second Semester

Chemistry

SPECTROSCOPY

Time : Three hours

Maximum : 75 marks

PART A — (5 × 5 = 25 marks)

Answer ALL questions.

1. (a) Explain various types of transitions and why butadiene has longer λ than ethylene.

Or

(b) Explain chromophores and auxochromes?

2. (a) Draw the block diagram of NMR instrument.

Or

(b) Explain germinal, vicinal and long range coupling.

3. (a) Explain double resonance techniques in NMR.

Or

(b) Explain NOE.

4. (a) Explain the factors affecting 'g' value.

Or

(b) Explain isomer shift.

5. (a) Explain the principle and instrumentation of photoacoustic spectra.

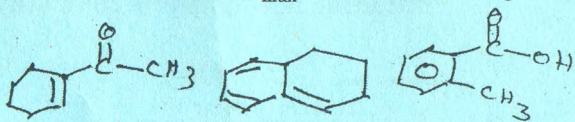
Or

(b) Explain finger print region?

PART B — (5 × 10 = 50 marks)

Answer ALL questions.

6. (a) (i) Calculate the λ_{\max} of the following :



(3 × 2 = 6)

(ii) Explain blue and red shift. (2 × 2 = 4)

Or

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(b) (i) Differentiate OH and NH peaks in IR.

(ii) Differentiate alkane, alkene, aromatic and alkyne stretching frequencies.

(iii) Explain different modes of bending vibration. (3 + 4 + 3)

7. (a) (i) Explain chemical shift and factors affecting chemical shift.

(ii) Why TMS is used as internal standard. (6 + 4)

Or

(b) (i) Write notes on shift reagents.

(ii) With example explain chemical and magnetic shift equivalence. (5 + 5)

8. (a) (i) Explain off resonance coupling $m^{13}\text{C-NMR}$.

(ii) Compare ^1H and $^{13}\text{C-NMR}$?

(iii) The chemical shift $m^{13}\text{C-NMR}$ is additive – explain. (3 + 4 + 3)

Or

(b) (i) Explain 2D-NMR.

(ii) Explain gauche effect. (6 + 4)

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