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Total No. of Pages : 02

Total No. of Questions : 09

M.Sc.(Chemistry) (2015 to 2017) (Sem.–2)

SPECTROSCOPY – I

Subject Code : MSCH-203

M.Code : 71664

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt FIVE questions in ALL including the Question No. 1 which is COMPULSORY and selecting ONE EACH from EACH UNIT.**

Q1. Answer briefly :

a. Explain emission and absorption spectra.

b. What are the different types of microwave ovens?

c. What is(are) the condition(s) for the substance to be Raman active?

d. How will you distinguish between acetaldehyde and acetone using IR spectroscopy?

e. What is the cause of Raman effects?

f. Describe the shift in absorptions of ($n \rightarrow \pi$) and ($\pi \rightarrow \pi^*$) when a more polar solvent is used.

g. What is chromophore? What structural features may produce chromophoric effect in an organic compound?

h. Discuss in brief cold vapour technique.

i. What types of interference is observed during sample analysis in Atomic Absorption Spectroscopy (AAS)?

j. What is the principle of flame emission spectroscopy?

UNIT-I

Q2. a. Discuss in brief Fourier transform spectroscopy.

b. What is computer averaging and stimulated emission? Discuss their applications.

Q3. What do you mean by microwave spectroscopy? Describe the techniques and instrumentation used in microwave spectroscopy.

UNIT-II

Q4. a. What is Raman spectrum? Name the different types of lines present in it. Explain factors affecting the intensity of spectral lines.

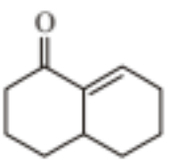
b. What are the advantages of Raman spectroscopy over infrared spectroscopy?

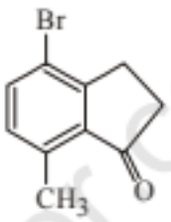
Q5. a. Explain the breakdown of the Born-Oppenheimer approximation.

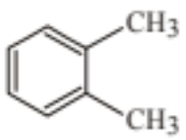
b. Write a short note on Finger print and functional group region in IR spectroscopy.

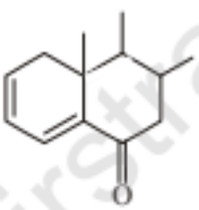
UNIT-III

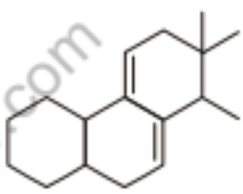
Q6. Following the Woodward Fieser rules, calculate the absorption maximum for each of the following compounds :

(i) 

(ii) 

(iii) 

(iv) 

(v) 

Q7. a. What are stereochemical factors? Discuss the applications of electronic spectroscopy.

b. How electronic absorption spectroscopy is used for chemical analysis? Explain.

UNIT-IV

Q8. Describe the principle, instrumentation and applications of Atomic Absorption Spectroscopy.

Q9. Discuss the principle of luminescence spectroscopy. Discuss with examples for the applications of luminescence spectroscopy in organic compounds.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.