M.Sc. DEGREE EXAMINATION,APRIL 2020
II Year IV Semester
Analytical Techniques in Chemistry

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

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

Answer any **TEN** questions

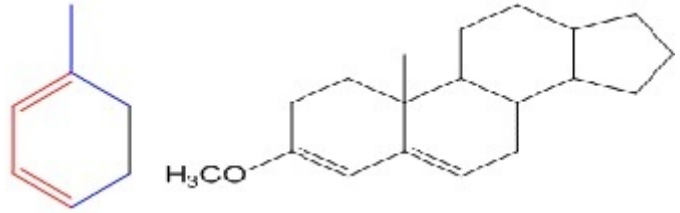
1. What is the source for IR? Mention the x axis and y axis in the plot of IR spectra.
2. Why NQR spectra can be done in solid samples only?
3. Mention the I value of ${}_9F^{19}$ and ${}_6C^{13}$.
4. Sketch the ESR spectra of methyl radical.
5. What is the unit of absorbance? Calculate the absorbance when 1% of light is transmitted from a cuvette.
6. What is Mid IR region? Convert 1700 cm^{-1} into energy(ev).
7. What is Birefringence?
8. What is meant by Isomer Shift in Mossbauer spectroscopy?
9. What are the charecteristics of a flame in AAS?
10. Distinguish Magnetic flux from magnetic susceptibility.
11. What is the plot of TGA and DTA?
12. Abbreviate ESCA and XPES.

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

Answer any **FIVE** questions

11. a)What are the physical parameters that can be obtained from DTA?
12. a) Explain the following terms i) Molecular ion peak ii) Base Peak iii) Meta stable peak.
13. Explain the ESR spectra of bis salicylaldiminecopper(II).
14. Describe the working principle of UV single beam spectrometer with a neat sketch.
15. What are the various types of interferences in Flame Atomic Emission spectroscopy?
16. How would you differentiate $[Fe(H_2O)_6]^{2+}$ from $[Fe(CN)_6]^{4-}$ using Mossbauer spectra.

17. Calculate the absorption maxima of the following compounds.



18. What are the types of furnaces used in AAS? Explain any one type in brief.
19. Discuss the fragmentation patten of primary, secondary and tertiary alcohols with suitable example.

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

Answer any **THREE** questions

20. a) State and explain Beer-Lamberts law. Mention its limitations. (6)
    b) Outline the principle and salient features of Raman spectroscopy. (4)
21. a) Distinguish Kramer's degeneracy from Zero field splitting with suitable examples.
    b) Explain the following. I) Curie temperature ii) Neel temperature (6+4)
22. a) Sketch the fragmentation pattern of 2-methyl pentane (4+6)
    b) Explain the principle involved in TGA.
23. a) Classify the following as Mossbauer active elements or Gamma Ray source elements or Elements not suitable for Mossbaeur. Cr, Mn, Fe, Co Ni. Justify your answer (6)
    b) Mention any six solvents used in Proton magnetic resonance spectroscopy. (4)
24. a) State Koopmans theorem and sketch the PES for MgO and HCl (6)
    b) What are the various chemical interferences observed in AAS? (4)

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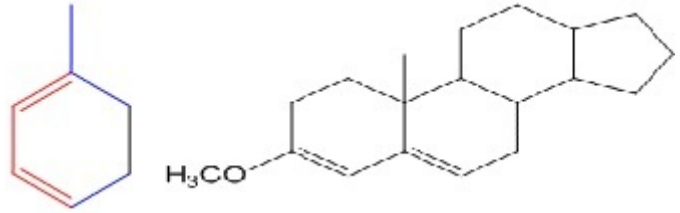

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