

## M.Sc. Sem.-1 Examination

404

Forensic Science

January-2024

Time : 2-30 Hours]

[Max. Marks : 70

**Que 1 Write the following**

- (i) Give a brief description of the instrumental components of Atomic Absorption spectrometer (AAS) with a schematic diagram. (7 Marks)
- (ii) Difference between Fluorescence and Phosphorescence (7 Marks)

**OR**

- (i) Give a brief description of the instrumental components of the FTIR spectrometer with a schematic diagram (7 Marks)
- (ii) Write a brief description of the instrumental components of Fluorescence Spectroscopy. (7 Marks)

**Que 2 Write the following**

- (i) What is Raman spectroscopy? Explain its principle and emitted radiation with graphical representation. (7 Marks)
- (ii) Write the principle of thermal analysis and explain its procedure. (7 Marks)

**OR**

- (i) Give a brief description of the instrumental components of the Raman spectrometer with a schematic diagram (7 Marks)
- (ii) Write the classification of thermal techniques. (7 Marks)

**Que 3 Write the following**

- (i) Explain in detail Scanning electron microscopy with diagram. (7 Marks)
- (ii) Write a note on Paper chromatography and its forensic significance. (7 Marks)

**OR**

- (i) Explain the basic principles of microscopy with ray diagram. (7 Marks)
- (ii) Write a note on 'Thin layer chromatography' and its forensic significance. (7 Marks)

**Que 4 Write the following**

- (i) Explain electron ionization in mass spectrometry (7 Marks)
- (ii) Discuss Chemical ionization technique in mass spectrometry. (7 Marks)

**OR**

- (i) Explain the functioning of the ion sorter in a single-focusing mass spectrometer. (7 Marks)
- (ii) Explain the fast atom bombardment ionisation technique used in mass spectrometry. (7 Marks)

**Que 5 Attempt any seven out of twelve**

(14Marks)

- (i) What is absorbance proportional to in Beer-Lambert's Law?
- (ii) Which type of electrons are involved in unsaturated bonds?

- (iii) What is the nature of the hypsochromic shift in the UV-visible spectra?
- (iv) Which anode and cathode sources are used in atomic absorption spectroscopy?
- (v) What is Rayleigh scattering
- (vi) The Raman spectrum is said to consist of Anti-strokes lines when  $\Delta\nu$  is .....
- (vii) ..... cannot be conserved during Raman scattering.
- (viii) Define resolution with an example
- (ix) What is the dichromic mirror?
- (x) What is light polarization?
- (xi) Which are common reagent gases used in fast bombardment ionisation.
- (xii) What is major disadvantage of electron ionisation?

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