

Roll No.

Total Pages : 2

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4406

INSTRUMENTAL ANALYSIS-I

Paper-FSC-102

Time allowed : 3 Hours]

[Maximum Marks : 80

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. Explain the following in brief: 8×2=16
- (i) Fluorescence.
 - (ii) Hollow cathode lamp.
 - (iii) Utility of graphite furnace in AAS.
 - (iv) Monochromators and their use in spectroscopy.
 - (v) Pyrolysis GC.
 - (vi) Infrared spectroscopy.
 - (vii) Quadrupole mass spectrometer.
 - (viii) Radio frequency waves in NMR.

UNIT-I

2. (a) Describe the principle and instrumentation of Phase contrast microscope. 8
- (b) Describe the applications of comparison and stereomicroscope in forensic science. 8

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3. Explain the following:

- (a) Polarisation microscopy. 8
- (b) Microspectrophotometry. 8

UNIT-II

4. Write short notes on the following:

- (a) Affinity Chromatography. 8
- (b) Instrumentation of GC. 8

5. Explain the following with reference to HPLC: 4×4=16

- (a) Injection system (b) Column structure
- (c) Detectors (d) Applications.

UNIT-III

6. (a) Write a note on Raman spectroscopy. 8
- (b) Explain source of radiations, wavelength selector, optical detectors and monochromators for UV-Visible and Infrared spectrophotometer. 8
7. What is ICP-AES? What elements can ICP-AES detect? Explain its principle and instrumentation. 16

Unit-IV

8. What is the basic principle of NMR spectroscopy? Which detector and what solvents are used in NMR? Explain the principle and techniques involved in NMR Spectroscopy. 16
9. Write short notes on following:
- (a) Tandem mass spectroscopy. 8
 - (b) X-ray diffraction. 8

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