

2024

ANALYTICAL INSTRUMENTATION

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

Answer any five questions

1. a) Explain biosensor. 4
b) With a neat diagram, explain the construction and working of AAS. 8
c) Specify the elements in a chromatograph. With a neat diagram, explain the working of a mass detector used in HPLC. 8
2. Specify the detector used in GC for detecting the following compound. With a neat diagram, explain its working.
(a) Aromatic hydrocarbon (b) Halogen (c) Phosphorous 7+7+6=20
3. a) With a neat diagram, explain the working of an fluorescent detector used in LC 6
b) With neat diagrams, explain any two types of gas analyzer. 14
4. a) With a neat diagram, explain a technique to monitoring the following pollutant in air:
(i) CO₂ (ii) SO₂ 12
b) Which counter does not differentiate the ionizing radiations or particles coming into it? With a neat diagram, explain its construction and working. 8
5. a) Explain principle of working of NMR spectroscopy. 6
b) Specify the elements of a mass spectrometer. With neat diagrams, explain any two types of mass spectrometers. 14
6. a) Specify the construction of ISE and also its classification. 4
b) Name an analytic instrument used for measuring the hydrogen ion concentration in milk. With a neat diagram, explain its working. 6
c) With a neat diagram, explain XRF Spectrometer. 10

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