

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, NOVEMBER - 2022**

ANALYTICAL INSTRUMENTATION

[Maximum marks: 100]

(Time: 3 Hours)

PART – A

Maximum marks : 10

I (Answer *all* the questions in one or two sentences. Each question carries 2 marks)

1. State Beer-Lambertz law.
2. State the principle of flame photometry.
3. List out the classifications of chromatography.
4. Define pH and pH scale.
5. Define the term Thermal conductivity.

(5 x 2 = 10)

PART – B

Maximum marks : 30

II (Answer any *five* of the following questions. Each question carries 6 marks)

1. Differentiate filter photometer and spectrophotometer.
2. Which are the basic components of infrared spectrometer.
3. Illustrate the principle of mass spectrometer.
4. State and explain the principle of Raman effect.
5. With neat diagram explain the construction and working of hydrogen electrode.
6. Draw the diagram of electrical conductivity analyser and explain the working.
7. Explain the construction and working of Zirconia oxygen analyser.

(5 x 6= 30)

PART – C

Maximum marks : 60

(Answer one full question from each unit. Each full question carries 15 marks)

UNIT –I

- III.(a) Draw and explain the working of infrared spectrophotometer. (8)
- (b) Explain the basic components of photometer. (7)

OR

- IV. (a) Draw and explain the working of double beam filter photometer. (9)
(b) Differentiate absorption and emission spectrum. (6)

UNIT-II

- V. (a) Explain the principle and working of NMR spectrometer with diagram. (8)
(b) Explain the construction and working of time of flight mass spectrometer. (7)

OR

- VI.(a) Describe the construction and working of magnetic deflection mass spectrometer. (8)
(b) With block diagram explain the working of Raman spectrophotometer. (7)

UNIT-III

- VII.(a) Explain the construction and working of calomel electrode. (7)
(b) Explain the construction and working of gas chromatograph. (8)

OR

- VIII.(a) Describe the principle of operation of combined PH electrode with diagram. (7)
(b) With a neat diagram explain the construction and working of liquid chromatograph. (8)

UNIT-IV

- IX. (a) Describe the working and principle of operation of negative filter type IR analyser with suitable diagram. (7)
(b) With neat diagram, explain the construction and operation of Thermal conductivity gas analyser. (8)

OR

- X. (a) Explain the working and principle of wind type paramagnetic oxygen analyser with suitable diagram. (8)
(b) Explain the construction and operation of positive filter type IR analyzer with neat diagram. (7)
