

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, NOVEMBER - 2023**

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. Define Spectroscopy.
2. State the principle of Raman effect.
3. List the sources of error in Glass electrode.
4. Write the importance of Buffer solution.
5. Write the classification of Infrared Analyzers. (5 x 2 = 10)

PART – B

Maximum marks: 30

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

1. Describe Absorption Spectrum and Emission Spectrum.
2. Explain fundamental laws of Photometry.
3. Explain the principle of Mass Spectrometer.
4. Explain the working of Flame photometer with a neat sketch.
5. Explain the construction of Calomel Electrode.
6. Explain the classification of Chromatography.
7. Describe the 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) Explain the construction and working principle of Single beam filter photometer. (9)
(b) List the basic components of Infrared Spectrophotometer. (6)

OR

IV. Explain the construction and working of Double beam Spectrophotometer. (15)

UNIT-II

V. Explain the construction and working of NMR Spectrometer. (15)

OR

VI. (a) Explain the construction and working of Time-of-Flight Mass spectrometer. (9)

(b) Explain the working of Raman Spectrophotometer with block diagram. (6)

UNIT-III

VII. (a) Explain the working of Hydrogen Electrode used for pH measurement. (8)

(b) Explain the working of Gas Chromatograph. (7)

OR

VIII. (a) Explain the construction and working of Combined pH electrode. (8)

(b) Explain the working of Glass Electrode used for pH measurement. (7)

UNIT-IV

IX. (a) Explain the construction and working of Thermal Conductivity Gas Analyzer. (12)

(b) Define paramagnetic property of gases. (3)

OR

X. Explain the construction and working of Magnetic Force type Paramagnetic Oxygen Analyzer. (15)
