

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2023**

ANALYTICAL INSTRUMENTATION

[Maximum Marks: **100**]

[Time: **3 Hours**]

PART-A

[Maximum Marks: **10**]

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

1. Give the frequency range of visible light.
2. Write the components of mass spectrometer.
3. Define pH.
4. Define chromatography.
5. State the principle of infrared analyzer. (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. Describe the principle of flame photometer.
3. State and explain Raman Effect.
4. Explain dip and flow type industrial pH electrode.
5. Explain the working of paper chromatography.
6. Explain the operation of magnetic wind type paramagnetic oxygen analyzer.
7. Describe the operation of thermal conductivity gas analyzer. (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. Describe the emission and absorption spectrum. (6)
- b. Explain the working of single beam filter photometer. (9)

OR

- IV. a. Describe construction and working of infrared spectrophotometer. (10)
b. List the basic components of photometer. (5)

UNIT – II

- V. a. Explain the principle of mass spectrometer. (5)
b. Explain the construction and operation of magnetic deflection type mass spectrometer. (10)

OR

- VI. a. Describe construction and working of NMR spectrometer. (10)
b. Describe the method of analysis using flame photometer. (5)

UNIT- III

- VII. a. Describe the working of digital pH meter. (6)
b. Explain the working of gas chromatography. (9)

OR

- VIII. a. Mention different types of errors in glass electrode. How is it being compensated? (9)
b. Describe the classification of chromatography. (6)

UNIT - IV

- IX. a. Explain the construction and operation of negative filter type IR analyzer. (8)
b. Explain about the principle and working of magnetic wind type paramagnetic gas analyzer. (7)

OR

- X. a. Describe construction and working of electrical conductivity analyzer. (10)
b. Describe the working principle of zirconia oxygen analyzer. (5)
