

--	--	--	--	--	--	--	--	--	--

## Third Semester B.E. Degree Examination, Dec.2019/Jan.2020

### Instrumental Methods of Chemical Analysis

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, choosing ONE full question from each module.**

#### Module-1

- 1 a. What is spectroscopy? Discuss different types of energies associated with molecules. (10 Marks)
- b. Explain in brief instrumentation and working of atomic absorption spectrophotometer. (10 Marks)

**OR**

- 2 a. Explain with neat sketch on flame photometry. (10 Marks)
- b. Discuss any two types of generating positive ions in mass spectroscopy. (10 Marks)

#### Module-2

- 3 a. Write a note on factors affecting electrophoretic mobility. (10 Marks)
- b. Write a note on radio immune array. (10 Marks)

**OR**

- 4 a. Write a note on half life of radioactive element. (10 Marks)
- b. Define the following terms:
  - (i) Electrophoresis
  - (ii) Free solution electrophoresis.
  - (iii) Zone electrophoresis. (10 Marks)

#### Module-3

- 5 a. What is polarography? With neat diagram, explain the working of dropping mercury electrode. (12 Marks)
- b. Explain rapid scan polarography. (08 Marks)

**OR**

- 6 a. Write a note on diffusion current and half wave potential. (10 Marks)
- b. Define : (i) Residual current (ii) Migration current. (10 Marks)

#### Module-4

- 7 a. Define chromatography. Explain classification of chromatographic methods based on separation. (12 Marks)
- b. Explain optimization of column performance. (08 Marks)

**OR**

- 8 a. Define the following terms: (i) Retention time. (ii) Retention volume. (iii) Flow rate. (06 Marks)
- b. Explain in brief principle and technique involved in TLC. Also mention the applications of TLC. (14 Marks)

#### Module-5

- 9 a. Discuss the types of columns used in gas chromatography. (08 Marks)
- b. Explain in brief any two types of detectors used in gas liquid chromatography. (12 Marks)

**OR**

- 10 Explain the principle, instrumentation, working and applications of HPLC. (20 Marks)

\* \* \* \* \*