

**B. TECH.**  
**(SEM. VIII) THEORY EXAMINATION 2018-19**  
**ANALYTICAL INSTRUMENTATION**

**Time: 3 Hours****Total Marks: 100****Notes:** Assume any Missing Data.**SECTION A**

- 1. Attempt all questions in brief. 2 x 10 = 20**
- a. What is spectrometer.
  - b. Define photometers.
  - c. What is meter scale?
  - d. Explain NMR.
  - e. What is flame photometer?
  - f. Explain Emission of electron in spectrograph.
  - g. Explain what is resonance
  - h. How can the need for an array of narrow-band filters and detectors be eliminated?
  - i. What is the x-y resolution of ISS?
  - j. What is Sputtering

**SECTION B**

- 2. Attempt any three of the following: 10x3=30**
- a. Describe with the help of diagram, the constructional details of interference filter and explain its working
  - b. Discuss the block diagram of a flame Emission spectrograph and explain its working
  - c. Explain Inductively coupled plasma mass spectrometer.
  - d. Explain Constructional details of NMR Spectrometers. Also explain Principle of operation.
  - e. Write and explain expression for concentration of flame photometry

**SECTION C**

- 3. Attempt any one part of the following: 10 x 1 = 10**
- a. Explain Double Beam Spectrophotometer with optical diagram and block diagram.
  - b. Explain Microprocessor based spectrophotometer with a proper block diagram
- 4. Attempt any one part of the following: 10 x 1 = 10**
- a. Discuss the basic components of IR Spectrophotometers? Explain sampling handling technique also
  - b. What are various application of mass spectrography? Explain where this technique is used
- 5. Attempt any one part of the following: 10 x 1 = 10**
- a. Explain ION Cyclotron Resonance (ICR) mass Spectrometer.
  - b. Explain Principle of operation of Basic Mass Spectrometer.
- 6. Attempt any one part of the following: 10 x 1 = 10**
- a. What are sources of interference? Explain Absorption Instrumentation
  - b. What are Flame photometers explain with block diagram its constructional details
- 7. Attempt any one part of the following: 10 x 1 = 10**
- a. What is T-60A NMR Spectrometer? Discuss with Diagram in support of your answer
  - b. What is tandem Mass Spectrometry (MS/MS)? Discuss in brief