647510 **MSC2MAtI101x** **Seat No :_____**

M.Sc. (Micro) Semester - 2 (*CBCS*) Examination
March/April – 2026 (As Per Syllabus Year-2018)
Analytical Techniques (INTDESC)

Time: 2:30 Hours **Marks:70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1 **Answer the following (any seven out of ten, each of two marks)** **(14)**

1. Explain the applications of Circular Dichroism (CD) spectroscopy in protein studies.
2. Enlist any four fluorescent dyes and state their uses in biological research.
3. What is tissue fixation? State its importance in microscopy.
4. Define gel electrophoresis and mention its basic principle.
5. Draw and label the light path of a fluorescence microscope.
6. Differentiate between Scanning Electron Microscope (SEM) and Transmission Electron Microscope (TEM).
7. Mention the applications of GC-MS in biological analysis.
8. State the importance and applications of 2D-PAGE in proteomics.
9. What is Beer-Lambert Law? State its significance in spectroscopy.
10. What is mass spectrometry? Mention its role in biomolecular analysis.

Que.2 **Write short note (any two)** **(14)**

1. Discuss fluorescence microscopy with a suitable labelled diagram and its applications.
2. Write a note on electron microscopy, explaining its types and advantages.
3. Describe the principle and applications of autoradiography in biological sciences.

Que.3 **Answer the following (both are compulsory)** **(14)**

1. Explain the principle and working of LC-MS/MS with its applications.
2. Describe the principle, types, and applications of ion exchange chromatography

OR

Que.3 **Answer the following**

1. Explain the basic principle and types of chromatography. [5]
2. What is HPLC? Describe its principle, instrumentation, and applications. [5]
3. Write a note on affinity chromatography and its uses in molecular separation. [4]

Que.4 **Answer the following (any two)** **(14)**

1. Explain the principle and applications of X-ray diffraction in elucidating 3D structure of biomolecules.
2. What is spectroscopy? Describe the principle and applications of mass spectrometry.
3. Explain the principle of infrared (IR) spectroscopy and its applications in biological studies.

Que.5 **Write short note (any two)** **(14)**

1. Describe Northern blotting technique and its applications.
2. Write a note on types of centrifuges and their uses.
3. Explain the applications of centrifugation techniques in biological research.

****