



CBCS SCHEME

18BT55

Fifth Semester B.E. Degree Examination, July/August 2021
Bioanalytical Techniques

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Substantiate the application of Mechanical methods of cell disruptions, with suitable case studies. (10 Marks)
b. What is Electrophoretic Mobility? Comment on the factors affecting the same, with appropriate equations. (05 Marks)
c. Justify the importance of Isoelectric focusing in Proteomics studies. (05 Marks)
- 2 a. Differentiate between the advantages of SDS – PAGE and Native PAGE techniques, with suitable examples. (10 Marks)
b. Evaluate the merits of Capillary electrophoresis in comparison to the Slab Gel based methods. (05 Marks)
c. Distinguish between Freeze thawing and Osmotic shock techniques towards cell lysis. (05 Marks)
- 3 a. Elaborate on the instrumentation and working principle of a HPLC system. Comment on the utilities of Isocratic and gradient HPLC systems. (10 Marks)
b. Comparatively discuss the applications of Bio – affinity and Pseudo – affinity chromatographic techniques with suitable Case studies. (10 Marks)
- 4 a. What is Gas Chromatography? Discuss its instrumentation and operations, with a schematic diagram. (10 Marks)
b. Distinguish between Normal phase and Reverse phase Chromatography techniques, with suitable applications. (10 Marks)
- 5 a. Discuss the Instrumentation theory and Applications of UV visible Spectrophotometers for Biomolecular analysis. (10 Marks)
b. What is ESR? Discuss the Instrumentation theory and applications of Spin – labeling techniques in ESR. (10 Marks)
- 6 a. With Appropriate theory, distinguish between the advantages of IR and Laser – Raman Spectroscopy. (10 Marks)
b. Discuss the Instrumentation and Applications of a Flow cytometer, with suitable case studies. (10 Marks)
- 7 a. What is Mass – Spectroscopy? Discuss the salient features of a Mass – Spectrometer and its applications in proteomics. (10 Marks)
b. What is NMR? Discuss the theory and its instrumentation in the investigation of biomolecular structures. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 8 a. What is MALDI – TOF? Discuss its construction and working principle for specific applications. (10 Marks)
- b. Discuss the steps involved in the elucidation of 3D structure of biomolecules via single crystal X – ray diffraction. (10 Marks)
- 9 a. Differentiate between the working principle and applications of SEM and TEM in Biomolecular studies. (10 Marks)
- b. Compare the merits of Confocal microscopy over the conventional wide field microscopy, With examples. (10 Marks)
- 10 a. Distinguish between the advantages of DSC and DTA in Biomolecular analysis. (10 Marks)
- b. Compare the advantages of Nano indentation and XPS in the study of Biomaterial techniques. (10 Marks)

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