

2071

M.Sc. (Biotechnology) Second Semester  
MBIO-203: Biophysical and Biochemical Techniques

Time allowed: 3 Hours

Max. Marks: 80

**NOTE:** Attempt five questions in all, including Question No. I which is compulsory and selecting one question from each Unit.

x-x-x

I. Answer the following briefly:-

- a) Raman Effect
- b) Void volume
- c) Extrinsic fluorescence
- d) 2D NMR
- e) Bragg's law
- f) Isoelectric focusing
- g) Radio isotopes
- h) Gradient gels

(8x2)

UNIT – I

- II. a) Explain the principle and applications of Ion-Exchange chromatography in detail.  
b) Write a note on chromatofocussing. (12,4)
- III. a) Explain the principles of size exclusion chromatography. Give its applications.  
b) Write note on hydrophobic interactions. (12,4)

UNIT – II

- IV. a) Derive Beer's Lambert law and write its applications in UV visible spectroscopy.  
b) Differentiate between NMR spectroscopy and X-crystallographic techniques. (10,6)
- V. a) Discuss the instrumentation and working of MALDI-TOF.  
b) Differentiate between IR and Raman spectroscopy. (12,4)

P.T.O.

(2)

UNIT – III

- VI. a) Discuss the principle of centrifugation. Explain diagrammatically the various types of rotors used in centrifugation.
- b) Explain Pulse Field Gradient Electrophoresis (PFGE). (12,4)
- VII. a) Explain the working of ultracentrifugation in detail. What are its various applications?
- b) What are various advantages and disadvantages of SDS PAGE? (12,4)

UNIT – IV

- VIII. a) Explain the chain-termination method for DNA sequencing.
- b) Briefly explain southern blotting and its applications. (12,4)
- IX. a) How radioactivity is measured using Liquid scintillation counting? Explain in detail.
- b) What are various types of radioactive decay? Explain. (10,6)

x-x-x