

**LMDE/D-23**  
**BIOTECHNIQUES**  
Paper : BT-104

Time : Three Hours]

[Maximum Marks : 80

**Note :** Attempt Question No. 1 which is Compulsory and *four* more questions selecting *one* question from each unit. All questions carry equal marks.

**Compulsory Question**

1. Briefly discuss the following :
  - (a) Diafiltration.
  - (b) X-Ray diffraction.
  - (c) Resolution power.
  - (d) Reversed phase chromatography.
  - (e) Isoelectrofocusing.
  - (f) Radioactive decay.
  - (g) Molar extinction coefficient.
  - (h) Basic components of spectrophotometry. (2×8=16)

**UNIT-I**

2. Discuss the following :
  - (a) Reverse osmosis and its applications.
  - (b) Lyophilization.

- (c) Ultracentrifugation techniques.
- (d) High pressure homogenization. (4×4=16)

3. Classify centrifugation techniques based on their principles. Discuss the applications of ultracentrifugation. (16)

### UNIT-II

4. (a) Explain the principle and applications of Fluorescence microscopy. (8)
- (b) Discuss the applications and limitations of scanning and transmission microscopy. (8)
5. Discuss in detail the principle, components, types and applications of electrophoresis. (16)

### UNIT-III

6. What are the basic types of Chromatography? Explain different types of chromatography based on the separation mechanism. (16)
7. Discuss the following :
- (a) Applications of HPLC.
  - (b) Principle of Hydrophobic interaction chromatography.
  - (c) Instrumentations of GLC.
  - (d) Limitations of TLC. (4×4=16)

## UNIT-IV

8. (a) What is autoradiography? Discuss the applications of radioisotopes in the biological sciences. (8)
- (b) Discuss the atomic absorption spectrophotometry and mention its uses. (8)
9. Write short notes on the following :
- (a) Principle of UV spectroscopy.
- (b) ORD and CD.
- (c) Mechanism of liquid scintillation detection.
- (d) Atomic emission spectroscopy. (4×4=16)
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