

- (b) Give a short note on the advantages and disadvantages in X-ray spectrometer.
19. (a) Define HPLC. Explain the applications of HPLC.

Or

- (b) What are the importances of LC-MS?
20. (a) Give a short note on advantages and limitations of PAGE gel electrophoresis.

Or

- (b) Describe the properties of agarose gel and explain factors affecting migration of nucleic acid in gel.

PART C — ($3 \times 10 = 30$)

Answer any THREE questions.

21. Detailed note on the principle, function and advantages of microtome.
22. Write about the working principle and advantages of STEM microscope.
23. Write in detail about the FTIR, - procedure principle and applications.
24. Define chromatography. Distinguish between the column and ion exchange chromatography.
25. Give an account on benefits and limitations of MALDI – TOF MS.

S.No. 6142

P 22 BTE 2 A

(For candidates admitted from 2022–2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Biotechnology — Elective

BIOANALYTICAL TECHNIQUES

Time : Three hours

Maximum : 75 marks

PART A — (20 Marks)

Answer ALL questions.

- I. (A) Choose the correct answer : ($5 \times 1 = 5$)
1. The electrodes used in pH measurement have which of the following internal resistances?
- (a) Very low resistance
(b) Moderate resistance
(c) Very high resistance
(d) No resistance
2. In fluorescence microscopy, which of the following performs the function of removing all light except the blue light?
- (a) Exciter filter (b) Barrier filter
(c) Dichroic mirror (d) Mercury arc lamp

3. The sequence of amino acids in proteins can be determined by
 - (a) Identification of the NH_2 terminal amino acids
 - (b) Identification of the $-\text{COOH}$ terminal amino acids
 - (c) Partial cleavage of the original polypeptide into smaller polypeptides
 - (d) All of the above
4. Which of the following is the reference that is generally used in FTIR interferometer?
 - (a) Air
 - (b) NaCl solution
 - (c) Alcohol
 - (d) Base solution
5. Which of the following is the basis of first dimension of separation for two-dimensional electrophoresis?
 - (a) Molecular mass
 - (b) Solubility
 - (c) Isoelectric point
 - (d) Folding

(B) Fill in the blanks : (5 × 1 = 5)

6. In laminar air flow, the velocity of the fluid at each point remains _____ throughout its flow.
7. The resolving power of unaided human eye is _____.
8. In scanning electron microscopy, a specimen is fixed and then coated with thin layer of a _____.

9. Separation of organic compounds by column chromatography is due to selective absorption _____.
 10. In an agarose gel, DNA segments under the influence of electric charge move towards the _____ electrode.
- II. Descriptive type questions: (5 × 2 = 10)
11. Hot air oven.
 12. SEM.
 13. FTIR.
 14. HPLC.
 15. MALDI -TOF - MS.

PART B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b).

16. (a) Write about the operation protocol of laminar air flow.
Or
 (b) Describe the principle of incubator.
17. (a) What are the basic components of TEM?
Or
 (b) Make a note on characteristics of dark field microscope?
18. (a) Enumerate the principle of colorimeter and their application.

Or