

B.Sc. Semester - 3 (NEP-2020) Examination**OCT/NOV-2024****BIT: Analytical tools and Techniques (Major-5)****Time: 2:00 Hours****Marks: 50****Instructions:**

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

- Que-1 Answer the following questions. (10)
- 1) Write detailed note on dark field microscopy.
 - 2) Explain the scanning Electron Microscopy
- OR
- 1) Briefly explain the Transmission Electron Microscopy.
 - 2) Explain how phase contrast microscopy enhances the visualization of transparent specimens.
- Que-2 Answer the following questions. (10)
- 1) What is absorption fluorimetry, and how is it used to measure the concentration of fluorescent molecules?
 - 2) Differentiate between UV and visible spectrophotometry in terms of their wavelength ranges and applications.
- OR
- 1) What is the principle of centrifugation, and why is it essential for separating cellular components?
 - 2) How are sub-cellular organelles isolated, and why is their isolation important for cell biology research?
- Que- 3 Answer the following questions. (10)
- 1) Describe the principle of gel filtration chromatography and the basis of separation in this technique.
 - 2) Explain the difference between paper chromatography and thin-layer chromatography (TLC).
- OR
- 1) Explain the principle of ion exchange chromatography and give an example of its application.
 - 2) What is High-Performance Liquid Chromatography (HPLC), and why is it widely used in analytical chemistry?
- Que- 4 Answer the following questions. (10)
- 1) Explain how SDS-PAGE works and why it is commonly used to determine protein molecular weight.
 - 2) What is immuno-electrophoresis, and how does it help in the detection of specific proteins?
- OR
- 1) What is agarose-gel electrophoresis, and what type of molecules does it commonly separate?
 - 2) What is the basic principle behind Western blotting, and what type of molecules does it detect?
- Que- 5 Write the short note on: (10)
- 1) Describe the basic principle of simple microscopy and name one application where it is commonly used.
 - 2) Explain the basic principle of colorimetry and provide one example of its application
- OR
- 1) Describe how paper chromatography works and mention one common application.
 - 2) Explain the purpose of a buffer in gel electrophoresis and how it affects the movement of molecules through the gel.
