

Section A: Objective Type Questions

Q1. Choose the appropriate Answer: (8x1.5=12)

- i. The numerical aperture (NA) of a microscope objective is a measure of its:
A Magnification power B Resolution
C Field of view D Working distance
- ii. In fluorescence microscopy, fluorophores are used because they:
A Absorb light and re-emit B Reflect light without changing
at a different wavelength its wavelength
C Increase the numerical D Decrease the wavelength of
aperture of the lens the light source
- iii. In TLC, how are the separated components identified?
A By their migration B By their colour
distance (R_f value)
C By their molecular D By their density
weight
- iv. In anion exchange chromatography, the stationary phase carries:
A Positively charged ions B Negatively charged ions
C Neutral molecules D Water molecules
- v. In the second dimension of 2-D PAGE, proteins are separated based on their:
A Molecular weight B Charge at a specific pH
C Hydrophobicity D Isoelectric point
- vi. What is the primary function of SDS in SDS-PAGE?
A To maintain proteins in B To give proteins a uniform
their native state negative charge
C To hydrolyse proteins D To stain the proteins for
into smaller peptides visualization
- vii. Which of the following techniques is used to detect and measure

- A Polymerase Chain B Enzyme-Linked
Reaction (PCR) Immunosorbent Assay (ELISA)
C Western Blotting D Flow Cytometry

viii. In an ELISA, what is the purpose of the secondary antibody?

- A To capture the antigen B To detect the presence of the
from the sample primary antibody
C To bind to the substrate D To immobilize the antigen on
and produce a colour the plate
change

Section-B: Descriptive Type Questions (Short Type)

Q2 : Answer all the Questions (8 x 4 =32)

- i. What is the principle of bright-field microscopy? Write down limitations of bright-field microscopy?
- ii. What does Beer-Lambert's Law describe?
- iii. Give a detailed account on thin layer chromatography.
- iv. What is relative centrifugal force?
- v. What is the principle of native polyacrylamide gel electrophoresis and its applications.
- vi. Write down short note on isoelectric focusing.
- vii. Give brief account of enzyme linked immunosorbent assay (ELISA)
- viii. What are characteristics of radioisotopes commonly used in biology?

Section – C: Descriptive Type Questions (Medium type)

Answer all the questions: (4 x 7=28)

- Q 3.** What is fluorescence microscopy and how does it differ from traditional light microscopy?

OR

Describe the principle and procedure of simple staining.

Q 4. Describe the principle behind differential centrifugation and its applications.

OR

Give a detailed account of ion-exchange chromatography.

Q 5. What is the principle of SDS-PAGE? How does SDS work to separate proteins?

OR

What is the principle of two- dimensional gel electrophoresis?
How does two- dimensional gel electrophoresis work to separate proteins?

Q6. Explain the Principle, procedure and application of immunodiffusion.

OR

What are radioisotopes? Give short account on types and properties of radioactive decay.

Section – D: Descriptive Type Questions (Long type)

Answer any two of the following: (2 x 14=28)

Q 7. Explain the principle and procedure of negative staining & differential staining.

8. Discuss Paper chromatographic technique and its applications.

Q 9. Discuss sodium dodecyl sulphate-polyacrylamide gel electrophoresis and its applications.

Q 10 Write down the principle, procedure and application of radioimmunoassay (RIA).