



BRAINWARE UNIVERSITY

Term End Examination 2024-2025

Programme – B.Sc.(BT)-Hons-2024

Course Name – Bioanalytical Tools and Techniques

Course Code - BBT27002 (T)

(Semester II)

Full Marks : 40

Time : 2:0 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 10=10

1. Choose the correct alternative from the following :

- (i) Name what is the principle behind paper chromatography?
 - a) Adsorption chromatography
 - b) Partition chromatography
 - c) Affinity chromatography
 - d) Both a) and b)
- (ii) Relate the property of microscope which utilizes the alignment of light waves in a specific orientation?
 - a) Reflection
 - b) Absorption
 - c) Scattering
 - d) Polarization
- (iii) Discuss what term did Robert Hooke coin after observing cork tissue under a compound microscope?
 - a) Cells
 - b) Microorganisms
 - c) Spermatozoa
 - d) Aberration
- (iv) Identify what does the Beer-Lambert law relate?
 - a) Concentration to temperature
 - b) Absorbance to path length and concentration
 - c) Fluorescence intensity to concentration
 - d) Wavelength to absorbance
- (v) Tell what is the primary use of spectrophotometry?
 - a) Measure fluorescence
 - b) Measure light absorption
 - c) Measure sound waves
 - d) Measure mass
- (vi) In spectrophotometry, what is the role of the monochromator?
 - a) To amplify light
 - b) To separate wavelengths
 - c) To detect fluorescence
 - d) To increase absorbance

- (vii) Predict which instrument is used to measure fluorescence?
- a) pH meter
 - b) Spectrofluorometer
 - c) Colorimeter
 - d) UV-Vis Spectrometer
- (viii) Indicate the primary purpose of a stacking gel in SDS-PAGE?
- a) Concentrates proteins
 - b) Denatures proteins
 - c) Reduces viscosity
 - d) Stabilizes proteins
- (ix) Explain the function of differential centrifugation?
- a) Separate organelles
 - b) Break down cells
 - c) Analyze molecules
 - d) Separate proteins
- (x) Which of these centrifuges is commonly used for blood separation?
- a) Clinical centrifuge
 - b) Refrigerated centrifuge
 - c) Ultracentrifuge
 - d) Fractionates samples

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Describe the main purpose of chromatography? (3)
3. Cite the typical wavelength range of visible light? Explain the concept of refraction in light microscopy. (3)
4. Describe the working principle of a Scanning Electron Microscope (SEM) (3)
5. Rewrite the role of Beta-marcaptoethanol in SDS-PAGE? (3)
6. Analyze Relative Centrifugal Force (RCF), and how is it calculated? Discuss its significance in centrifugation experiments. (3)

OR

Explain Density Gradient Centrifugation and its principle. (3)

Group-C

(Long Answer Type Questions)

5 x 3=15

7. Compare and contrast the principles and applications of agarose-gel electrophoresis and polyacrylamide gel electrophoresis, highlighting their distinct advantages and limitations in nucleic acid analysis and characterization. (5)
8. State the definition of R_f and how is it calculated? How is the retention factor (R_f) value used in TLC? (5)
9. Compare what is RPM and RCF? Explain the principle of centrifugation (5)

OR

Discuss the types of centrifuges and their applications in separating biological samples. (5)
