STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI – 600086.
Department of Chemistry and Botany
End Semester Examination November 2021

Title: BIOANALYTICAL TECHNIQUES **Maximum Marks: 100**
Subject code: 19ID/IC/BA55 **Maximum Time: 3 Hours**

SECTION A

Answer all the questions (30M)

I. **Choose the correct option in the following: (5x2 = 10)**

1. The function of condenser on a light microscope is

   a. To focus the light source c. To diffuse the light source

   b. To provide the light source d. To control the light source

2. The wavelength of radiation with a frequency of 8.0×10^{14} Hz is _____m.

   a. 3.75×10^{-7} b. 2.4×10^{23} c. 3.75×10^{7} d. 2.4×10^{-23}

3. Identify the organic precipitant from the given list of precipitants-

   a. dimethyl glyoxime c. sulphuric acid

   b. Ammonium hydroxide d. H_2S

4. The Separation techniques that exploit differences in Electric charge is _____

   a. Extraction b. Chromatography c. Electrophoresis d. Distillation

5. The source of UV radiation is _____ lamp.

   a. Laser b. Tungsten – halogen c. Hydrogen d. Mercury

II. Fill in the blanks (5x2=10M)

6. Von Weimarn equation is _____.
7. Sectioning is accomplished by using a cutting apparatus called a _____.
8. Phase contrast microscope was invented by _____.
9. Point illumination and spatial hole are used in _____ microscope.
10. The anionic detergent used in PAGE is _____.

III. Match the following: (5x2 =10)

1.	Chloroform	a. Desiccant
2.	Low wavelength	b. Precipitating agent for Nickel ions
3.	Phosphorous pentoxide	c. Beer Lambert's law
4.	dimethyl glyoxime	d. High energy wave
5.	UV-Visible spectroscopy	e. low energy wave
		f. solvent

SECTION B

Answer <u>any five</u> of the following: (5x8 = 40)

6. a. Mention any 3 stains used for electron microscopy. (4)
   b. List the conditions for a good desiccant. (4)
7. a. Write informative notes on Formalin Acetic Acid (4)
   b. Mention the types of Density gradient Centrifugation. (4)
8. a. Explain with examples solvent extraction using chemically active solvents. (4)
   b. Calculate the concentration of a solution of the compound that has an absorbance of 0.625. Given: molar absorptivity of compound at 425nm is 2.45×10^3 L $mol^{-}cm^{-}$ (4)
9. a. Draw the diagram of capillary electrophoresis system. (4)
   b. Explain the principle involved in AAS and Fluorimetry. (2+2 =4)
10. a. Define Immunoelectrophoretic and give its applications. (4)
    b. Explain the processes - nucleation & crystal growth, in separation of a metal ion by precipitation method. (4)
11. a. Explain the following: (2+2= 4)
    i) Concentrated sulphuric acid as a desiccant
    ii) Post precipitation
    b. Complete the following table- (4)

S. No.	Absorbance	Transmittance
a.	0.75	_____
b.	_____	.80
c.	0.55	_____
d.	_____	0.20

12. a. Explain the estimation of sodium ions by Flame photometry (5)
    b. List the limitations of Beer Lambert's law. (3)

SECTION C

Answer <u>any two</u> of the following: (2x15 = 30)

13. a. Explain in detail the instrumentation and applications of TEM. (8)

    b. Discuss the steps involved in agarose gel electrophoresis. (7)

14. a. Give an account of different types of Coprecipitation. (9)

    b. List the properties of solvents used in solvent extraction (6)

15. a. Describe the steps involved in differential centrifugation with a flow chart**.** (4)

    b. Draw the ray diagram for DIC**.** (4)

    c. Explain with a neat diagram, the extraction of a plant pigment using Soxhlet extractor. (4)

    d. Explains the technique of steam distillation (3)

****