

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086**  
(For candidates admitted from the academic year 2008-09 & thereafter)

**SUBJECT CODE: BT/ME/BI25**

**B. Sc. DEGREE EXAMINATION, APRIL 2009**  
**BRANCH V (A) – PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**  
**SECOND SEMESTER**

**COURSE : MAJOR - ELECTIVES**  
**PAPER : BIOINSTRUMENTATION**  
**TIME : 3 HOURS** **MAX. MARKS: 100**

**SECTION – A**

**ANSWER ALL QUESTIONS**

**I CHOOSE THE RIGHT ANSWER ( 5 x 1 = 5)**

1. In Centrifugation, the sedimentation rate becomes \_\_\_\_\_, when the density of the particle and the medium are equal.  
a. more            b. less            c. zero
2. Substances which can be evaporated in the temperature range of 300 – 400<sup>0</sup>C could be analysed by \_\_\_\_\_.  
a. HPLC            b. GLC            c. Column chromatography
3. The pattern, of energy absorption, by a solution, when light of different wavelengths, passes through it, is called \_\_\_\_\_.  
a. Absorption spectrum    b. Emission spectrum    c. Visible spectrum
4. \_\_\_\_\_ is the device that measures the intensity of light, before and after, it passes through a coloured solution.  
a. Spectrophotometer            b. Nephelometer    c. Colorimeter.
5. Water is a \_\_\_\_\_ Electrolyte.  
a. Strong            b. Weak            c. None

**II FILL IN THE BLANKS ( 5 x 1 = 5)**

6. \_\_\_\_\_ & \_\_\_\_\_, Buffers are widely used in clinical laboratories.
7. The 2 electrodes used in a P<sup>H</sup> meter are  
1. calomel electrode and            2. \_\_\_\_\_ electrode.
8. In \_\_\_\_\_ the Heavy metal salts used are Osmium tetroxide uranyl acetate and lead citrate.
9. The Illumination source in electron Microscope is a \_\_\_\_\_ which emits electrons.
10. \_\_\_\_\_ is the negative logarithm of Hydrogen ion Concentration.

**III MATCH THE FOLLOWING ( 4 x 1 = 4)**

- |                       |   |                  |
|-----------------------|---|------------------|
| 11. Chromatography    | - | Gradient elution |
| 12. GLC               | - | Monochromator    |
| 13. Spectrophotometry | - | Helium           |
| 14. HPLC              | - | Adsorption       |

**IV STATE WHETHER TRUE OR FALSE****( 4 x 1 = 4)**

15. In ultra centrifuges the rotor chamber is refrigerated.
16. The unit of sedimentation coefficient is also termed as one svedberg unit.
17. The wavelength of electrons in an electron microscope can be as short as 0.004 nm, about 100,000 times shorter than that of light.
18. In Freeze Fracture, the specimens are frozen in Liquid Nitrogen.

**V. ANSWER ANY SIX OF THE FOLLOWING QUESTIONS IN 50 WORDS EACH****(6 X 3 = 18)**

19. Mention any 3 factors that affect  $P^H$  measurement?
20. Define Chromatography?
21. Single beam Spectrophotometer?
22. What are Buffers?
23. What is Homogenization?
24. Explain, what is  $R_f$  value.
25. Mention any one commonly used solvent mixtures of paper chromatography.
26. What is Agarose.
27. What are the advantages of TLC.

**SECTION - B****ANSWER ANY FOUR OF THE FOLLOWING IN 200 WORDS: (4 x 6 = 24)**

28. Compare SEM with TEM. Any 6 points?
29. Explain the working of a  $P^H$  meter.
30. Describe a Double beam spectrophotometer.
31. State and explain Beer – Lambert's Law.
32. Describe PAGE.
33. Explain the Principle of Electrophoresis.

**SECTION – C****ANSWER ANY TWO IN 1000 WORDS. DRAW DIAGRAMS WHEREVER NECESSARY:****(2 x 20 = 40)**

34. Write an Essay on phase contrast microscope?
35. Write an essay on Polarizing Microscope?
36. Explain the Principle, Technique and the application of HPLC.
37. Describe the Following:
  - a. Analytical Centrifuge
  - b. Ultra Centrifuge
  - c. Density gradient
  - d. Differential Centrifugation.

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