

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**



**M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY**

**SECOND SEMESTER – APRIL 2022**

**PBT 2602 – BIOANALYTICAL TECHNIQUES**

Date: 24-06-2022

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

**PART – A**

**Answer ALL the Questions**

**I. Choose the correct answer**

**(5 x 1 = 5 Marks)**

1. A type of density gradient used in centrifugation  
a) Ethanol                      b) Sucrose                      c) Chloroform                      d) Acrylamide
2. Which chromatography technique involves holding the stationary phase in a narrow tube and mobile phase is forced through it under pressure?  
a) Column                      b) Planar                      c) Liquid                      d) Gas
3. The structure of solid materials is investigated by using  
a) Microwave                      b) x- ray  
c) Gamma ray                      d) Infra-red ray
4. The reduction in counting efficiency of the scintillation detector is called  
a) Disintegration                      b) Decay  
c) Quenching                      d) Reduction
5. Which material is used for PET detector?  
a) Bismuth                      b) Silver                      c) Lead                      d) Aluminum

**II. State whether the following are true or false.**

**(5x1=5 Marks)**

6. Sedimentation and centrifugation involves two miscible phases.
7. Chromatography is a physical method that is used to separate and analyze simple mixtures.
8. X- rays are one of the forms of heat radiation.
9. Geiger Muller counter measures intensity of radioactive radiation.
10. Diffusion weighted imaging measures the motion of water molecules.

**III. Complete the following**

**(5 x 1= 5 Marks)**

11. Differential centrifugation relies on the differences in \_\_\_\_\_ of biological particles.
12. \_\_\_\_\_ is the source of agarose used in agarose gel electrophoresis.
13. Lead levels in drinking water could be measured by \_\_\_\_\_.
14. Inert gas used in Geiger-Müller tube is \_\_\_\_\_.
15. Detector in PET is made up of \_\_\_\_\_ material.

**IV. Answer the following within 50 words**

**(5 x 1 = 5 Marks)**

16. Which centrifugation method is used to separate organelles from whole cell?
17. Define Rf value?
18. What are molecular rotations?
19. Which instrument is used to detect ionizing radiation?
20. What makes PET unique when it comes to nuclear imaging?

**PART B**

Answer the following each within 500 words.

(5 x 8 = 40 Marks)

Draw diagrams wherever necessary.

21. (a) Explain the principles of sedimentation.

**OR**

(b) Write note on differential centrifugation technique.

22. (a) Discuss briefly on principle and working of IEF gel electrophoresis.

**OR**

(b) Briefly explain the theory of pulse field gel electrophoresis.

23. (a) Give a short account on fluorescence spectroscopy.

**OR**

(b) Write notes on UV spectroscopy.

24. (a) Discuss the principle and importance of Geiger-Muller counter.

**OR**

(b) Briefly write about how mass spectrometry technique could be used for determination of analytes.

25) (a) What is electroencephalogram? Write a note on its principle.

**OR**

(b). Give an account on working of PET scan and its applications.

**PART – C**

Answer any TWO of the following, each within 1500 words.

(2 x 20 = 40 Marks)

Draw diagrams wherever necessary.

26. Explain in detail the differential centrifugation technique and applications.

27. Propose a methodology where you can purify protein molecules from a complex mixture.

28. Describe the principle and methodology of MALDI TOF.

29. “Magnetic resonance imaging technique is a vital tool in staging prostate cancer and risk assessment”.

Justify

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