22MBU413N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2025
(Fourth Semester)

Branch - **MICROBIOLOGY**

BIOINSTRUMENTATION

Time: Three Hours | Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Name the method measuring the analyte concentration depending on the quantity of light received. a) Spectroscopy b) Decantation c) Potentiometer d) Electrophoresis	K1	CO1
	2	Identify the device associated with calomel tube. a) Calorimeter b) pH meter c) Biosensor d) Centrifuge	K2	CO2
2	3	Relate the process of centrifugation which is dependent on buoyant densities. a) Differential centrifugation b) Gradient centrifugation c) Density gradient centrifugation d) Isopynic centrifugation	K1	CO1
	4	Recall the principle of centrifugation. a) Sedimentation of particles based on their charge b) Separation of components based on density differences c) Separation of particles based on their size d) Separation of particles using heat	K2	CO2
3	5	Which of the following cannot be used as an adsorbent in Column adsorption chromatography? a) Magnesium oxide b) Silica gel c) Activated alumina d) Potassium permanganate	K1	CO1
	6	Which subtances are separated by chromatography for the analysis of biological molecules? a) Simple mixtures b) Complex mixtures c) Viscous mixtures d) Metals	K2	CO2
4	7	Match the statement of electrophoresis apparatus for which it is consist of ? a) Gel, buffer chamber and fire pack b) Buffer chamber and electrophoresis unit c) Electrophoresis unit and gel separator d) Power pack and electrophoresis unit	K1	CO1
	8	Choose the loading dye which may be exploited in the identifying of DNA bands. a) BTB b) TEMED c) APS d) BPB	K2	CO2
5	9	Locate the measurement unit of radioactivity. a) curie b) rpm c) meter d) cm/s	K1	CO1
	10	Which of the following is having a quenching property for radioactive mechanism? a) Propane b) Sodium iodide c) Zinc sulphate d) Super critical fluid	K2	CO2

Cont...

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Draw a neat labeled diagram of a pH meter and add a note on its working principle.	K2	CO1
		(OR)		
	11.b.	What is the difference between colorimeter & spectrophotometer? Comment.		
2	12.a.	Illustrate the process of differential centrifugation with a neat sketch.	K3	CO2
		(OR)		
	12.b.	How does density gradient centrifugation work in processing of a sample? Explain the steps.		
3	13.a.	Outline the mechanism of HPLC with a neat diagram.	K3	CO2
		(OR)		
	13.b.	Interpret the process of ion exchange chromatography and add a note of its application.		
4	14.a.	Apply & analyze the concept of Immuno electrophoresis in the diagnosis of a disease.	K4	CO3
		(OR)		
	14.b.	List out the components of PAGE and illustrate the significance of it.		
5	15.a.	Compare and contrast between solid and liquid scintillation process with a labeled diagram.	K4	CO4
		(OR)		
	15.b.	Mention few examples of radioactive isotopes and brief on its therapeutic aspects of it in biological sciences.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Classify the significant parts of an electrochemical biosensor and state the principle behind its biological use.	K4	CO3
2	17	Categorize the instrumentation and principle of ultracentrifugation.	K4	CO4
3	18	Distinguish between paper chromatography and thin layer chromatography.	K4	CO3
4	19	Analyze the steps of Agarose gel electrophoresis for the examination of heredity material.	K4	CO4
5	20	Examine the working principle of GM counter with a suitable diagram.	K4	CO4

Z-Z-Z END