



Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD)
Re-accredited with 'A++' Grade by NAAC. Recognised by UGC Under Section 12B
Coimbatore - 641 043, Tamil Nadu, India

School of Engineering
Continuous Internal Assessment Test II – April 2025
IV Semester

Class: II B.Sc

Time: 2 Hours

Branch: Physician Assistant

Max. Marks: 60

22BPAD04 Biomedical Instrumentation and Scientific Measurements

Course Outcomes:

CO1:	Gain knowledge on the scope of medical instrumentation and bio-sensors.
CO2:	Describe the principle behind Electro-physiological Equipment
CO3:	Discuss the devices used for measurements of blood flow & gas flow
CO4:	Describe the working of Clinical and Medical Imaging Equipment.
CO5:	Discuss the working of therapeutic equipment and the importance of electrical safety.

Part A		6 x 1 = 6	
Choose the Correct Answer			
1.	What type of sensor is used to measure blood flow using heat transfer?	CO3	K1
	a. Ultrasonic flow meter.	b.	Thermal convection velocity sensor.
	c. Oscillometric sensor.	d.	Piezoelectric sensor.
2.	Which of the following techniques is used to measure blood flow velocity in arteries?	CO3	K1
	a. Electromagnetic flowmetry.	b.	Impedance plethysmography.
	c. Thermodilution method.	d.	Oscillometric method.
3.	Why is ELISA preferred for detecting antigen-antibody reactions in immunoassays?	CO4	K1
	a. It provides high specificity and sensitivity.	b.	It does not require labeled antibodies.
	c. It requires minimal sample preparation.	d.	It does not require washing steps.
4.	Which type of chromatography is most suitable for separating and analyzing proteins in clinical diagnostics	CO4	K1
	a. Gas chromatography.	b.	Ion-exchange chromatography.
	c. Thin-layer chromatography.	d.	Size-exclusion chromatography.
5.	Which of the following devices is used for breaking kidney stones?	CO5	K1
	a. Surgical diathermy.	b.	Defibrillator.
	c. Defibrillator.	d.	Infusion pump.
6.	What is the primary function of an isolation transformer in hospital electrical systems?	CO5	K1
	a. To amplify signals for diagnostic devices.	b.	To prevent electrical interference from nearby equipment.
	c. To protect patients and staff from leakage currents and electric shock.	d.	To increase the power supply to medical equipment.

	PART B Answer ALL questions	3x6=18	
7a.	Discuss the advantages and limitations of plethysmography in clinical applications. Provide examples of conditions where it is used.	CO3	K2
	(or)		
7b.	Explain the working principle of an ultrasonic flow meter.	CO3	K2
8a.	Describe the role of centrifugation in medical laboratories. How does it help in blood and urine analysis?	CO4	K2
	(or)		
8b.	Explain the concept of ELISA and its importance in detecting infectious diseases.	CO4	K2
9a.	What is surgical diathermy? Explain its principle and its types	CO5	K2
9b.	Discuss the importance of electrical safety codes in hospitals. How do they prevent electrical hazards?	CO5	K2
	PART C Answer ALL questions	3x12=36	
10a.	Explain in detail the different lung volumes and capacities. Illustrate with a labeled spirometry graph.	CO3	K2
	(or)		
10b.	Explain the working principle of an Electromagnetic blood flow meter. Write a note on its applications?	CO3	K2
11a.	Explain in detail the working principle, components and applications of MRI scanner. How is it differ from other imaging techniques?	CO4	K2
	(or)		
11b.	Discuss the various types of chromatography used in medical diagnostics. Explain their working principle and their applications.	CO4	K2
12a.	Describe the working of ventilators and their significance in respiratory support.	CO5	K2
12b.	Discuss the principle, working and clinical applications of a haemodialysis machine. How does it help in renal failure management?	CO5	K2

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