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 I – February 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 is the primary function of a biomedical amplifier? **CO1** **K1**
   a. To convert an analog signal to digital
   b. To increase the magnitude of bio-signals
   c. To filter unwanted noise
   d. To store electrical signals
2. Which characteristic determines the accuracy of a sensor? **CO1** **K1**
   a. Sensitivity
   b. Linearity
   c. Resolution
   d. Repeatability
3. What type of electrode is commonly used for recording EEG signals? **CO2** **K1**
   a. Surface electrodes
   b. Needle electrodes
   c. Plate electrodes
   d. Pressure electrodes
4. Which of the following is a non-invasive method of biotelemetry? **CO2** **K1**
   a. Catheter-based telemetry
   b. Implanted microchip sensors
   c. Wearable ECG monitors
   d. Intra-body microelectrodes
5. Cardiac output can be measured using: **CO1** **K1**
   a. Fick's principle
   b. Doppler ultrasound
   c. Thermodilution method
   d. All of the above
6. Which of the following techniques is used to measure blood volume? **CO1** **K1**
   a. Plethysmography
   b. Plethysmography
   c. EEG
   d. EMG

PART B **3x6=18**

Answer ALL questions

7a.	Classify biomedical instruments based on their functionality and application. Provide suitable examples for each category.	**CO1**	**K2**
	(or)		
7b.	Explain the importance of signal processing in biomedical instrumentation	**CO1**	**K2**
8a.	What is Biotelemetry? Explain its significance in remote patient monitoring.	**CO2**	**K2**
	(or)		
8b.	Compare different electro-physiological recording devices.	**CO2**	**K2**
9a.	Explain the difference between oscillometric and auscultatory methods of blood pressure measurement.	**CO3**	**K2**
	(or)		
9b.	Explain the importance of blood flow measurement in medical diagnostics.	**CO3**	**K2**

PART C **3x12=36**

Answer ALL questions

10a.	Describe in detail the static characteristics of biomedical instruments	**CO1**	**K2**
	(or)		
10b	Explain the important terminologies used in medicine and medical devices. Discuss their significance in biomedical instrumentation with suitable examples.	**CO1**	**K2**
11a.	Describe the working principle of an Electrocardiogram (ECG). What are its major components?	**CO2**	**K2**
	(or)		
11b	Explain an Audiometer in detail. How does it help in diagnosing hearing impairments?	**CO2**	**K2**
12a.	Describe the working principle of a sphygmomanometer. How is it used to measure blood pressure?	**CO3**	**K2**
	(or)		
12b	What is cardiac output? Explain any one method used to measure it.	**CO3**	**K2**

Course Instructor **Exam In-charge** **IQAC(Engg)** **HoD - BMIE**