



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
Branch: Physician Assistant

Time: 2 Hours
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

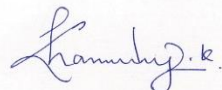
3x12=36

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