

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0314

Roll No.

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**B.Tech.**

(SEM. VII) ODD SEMESTER THEORY EXAMINATION 2010-11

**BIO-MEDICAL INSTRUMENTATION**

Time : 3 Hours

Total Marks : 100

Note : (1) Attempt **all** questions.

(2) All questions carry equal marks.

1. Attempt any **four** parts of the following :— (5×4=20)

(a) What are the requirements for giving specifications of bio-medical instrumentation system ? Explain briefly.

(b) What do you understand by bioelectric potentials ? Enlist different type of bio-potential.

(c) What is a Transducer ? What is its principle of operation and working ? Differentiate between Active and Passive transducers.

(d) What is EMG ? How it develops ? What are the frequencies of signal present ?

(e) Differentiate between micro-electrodes and body surface electrodes.

(f) Explain various components of physiological system of the body.

2. Attempt any **four** parts of the following :— (5×4=20)

(a) What is the Electrocardiography ? Discuss various characteristics features of ECG amplifiers.

- (b) Explain the following ECG recorders :—
- Three channel
  - Vector cardiography.
- (c) What are the parameters recorded and displayed in intensive care units ? Explain the most important one.
- (d) Discuss Electrodes and leads that are affixed to the body of the patient in order to record an electro-cardiograph.
- (e) Explain the ultrasonic method of blood flow measurement.
- (f) Discuss an automated indirect method of blood pressure measurement.
3. Attempt any *two* parts of the following :— (2×10=20)
- What is the function of respirator ? How it is used for a patient care ?
  - Describe and explain briefly Humidifiers, Nebulizers and Aspirators.
  - What are plethysmographs ? How can they be used for the measurement of intrathoracic pressures ?
4. Attempt any *two* parts of the following :— (2×10=20)
- Explain the working principle of CT-Scan with block diagram and systems components also.
  - What are the properties of ultrasound ? Discuss the basic modes of transmission of ultrasound.
  - Explain and describe emission computerized tomography (ECT).
5. Attempt any *two* parts of the following :— (2×10=20)
- What are physiological effect of electrical current ? Discuss various methods of accident prevention.
  - How can telemetry be done for ECG measurement during exercise for emergency patient monitoring and from extended coronary care patients ?
  - Describe pacemaker and defibrillator and difference between them.