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

PAPER ID : 0314 Roll No. | | | | | | | | | | |

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 :
   (i) Three channel
   (ii) 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)**

(a) What is the function of respirator ? How it is used for a patient care ?

(b) Describe and explain briefly Humidifiers, Nebulizers and Aspirators.

(c) 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)**

(a) Explain the working principle of CT-Scan with block diagram and systems components also.

(b) What are the properties of ultrasound ? Discuss the basic modes of transmission of ultrasound.

(c) Explain and describe emission computerized tomography (ECT).

5. Attempt any *two* parts of the following :— **(2×10=20)**

(a) What are physiological effect of electrical current ? Discuss various methods of accident prevention.

(b) How can telemetery be done for ECG measurement during exercise for emergency patient monitoring and from extended coronary care patients ?

(c) Describe pacemaker and defibrillator and difference between them.