B. Tech.

(SEM. IV) EXAMINATION, 2006-07

TRANSDUCERS IN BIOMEDICAL INSTRUMENTATION

Time : 3 Hours] [Total Marks : 100

Note : (1) Answer all questions.
(2) All questions carry equal marks.
(3) In case of numerical problems assume data wherever not provided.
(4) Be precise in your answers.

1 Attempt any four parts of the following : $5 \times 4 = 20$

(a) Draw the block diagram for man instrumentation system. State the problems encountered in the same.

(b) What are microelectrodes, how are they used?

(c) Describe any two pressure transducers used in biomedical application.

(d) How does potential propagate in cell? What is the role of refractory period in this?

(e) Explain how blood gas electrodes work.

(f) What is the significance of EEG?
2 Attempt any **four** parts of the following: \(5 \times 4 = 20\)
(a) What is vector cardiograph? How does it differ from electrocardiograph?
(b) Give a method to measure the heart rate of a patient.
(c) Explain how blood pressure is measured using Korotkoff’s method.
(d) Classify different types of pacemaker.
(e) Explain a dc defibrillator.
(f) Explain electromagnetic type of blood flow meter.

3 Attempt any **two** parts of the following: \(10 \times 2 = 20\)
(a) Explain the working of ultrasonic Spirometer.
(b) Which are the tests used for measuring breathing mechanics?
(c) Write a short note on humidifiers, nebulizers and aspirators.

4 Attempt any **two** parts of the following: \(10 \times 2 = 20\)
(a) Explain in brief magnetic resonance imaging.
(b) What is echo-cardiograph?
(c) How is ionizing radiation generated?

5 Attempt any **two** parts of the following: \(10 \times 2 = 20\)
(a) Telemetry can be used for emergency patient monitoring. Explain.
(b) Explain a conventional hearing aid with neat sketch.
(c) Discuss the effects of electric current on human body.