

SIXTH SEMESTER B.TECH DEGREE EXAMINATION

13.604 BIOMEDICAL INSTRUMENTATION (A)

Time: 3 Hours

Max.

Marks : 100

PART - A

(Answer all questions. Each question carries 4 marks.)

1. What is bioelectric potential. How it is generated?
2. What is Poiseuille's Law linked to the blood flow rate?
3. What is a neuron? Explain briefly.
4. Mention limitations of MRI?
5. What is the difference among A, B and T-M scan modes in Ultrasound scanning?

PART - B

(Answer any one question from each Module.)

Module - I

6.
 - a. Sketch the block schematic of a ECG machine. Explain its working.
(10 Marks)
 - b. Draw the block diagram for set up for EMG recording. Explain in detail about the pre- amplifier circuit used.
(10 Marks)
7.
 - a. Distinguish between bipolar and unipolar types of electrodes used in a ECG machine. How are they connected. Explain (10 Marks)
 - b. Draw the block schematic of a EEG machine . Explain each block in detail. (10 Marks)

Module - II

8.
 - a. What is microwave diathermy. Explain with help of circuit diagram the working of a microwave diathermy machine (10 Marks)

- b. Distinguish between analog and digital hearing aids. Explain the working of a digital hearing aid with the help of a block diagram (10 Marks)
- 9.
- a. Explain the working of a Oximeter. Explain how the respiratory rate is measured. (10 mark)
- b. Explain with neat diagram the working of a artificial Kidney machine (10 Marks)

Module - III

- 10.
- a. Explain how the ECG and respiration are monitored through telemetry. (10 Marks)
- b. What are the sources of electrical hazards. Explain about the precautions to be observed to prevent hazards. (10 Marks)
- 11.
- a. Discuss about an implantable telemetry system for blood pressure and blood flow monitoring (10 Marks)
- b. Discuss in detail about the transmission of analog physiological signals over telephone lines (10 Marks)

Module - IV

- 12.
- a. Explain a NMR detection system with the help of a neat block diagram (10 Marks)
- b. Draw the block diagram of basic X-ray machine. Explain each block in detail. (10 Marks)
- 13.
- a. What are the principles of NMR Imaging systems. Explain one of the image reconstruction techniques for spatial discrimination and mapping of NMR signals. (10 Marks)
- b. Discuss on DNA sequence analysis (10 Marks)