

# Sixth Semester B.Tech. Degree Examination

(2013 Scheme)

## 13.606.1 BIOMEDICAL INSTRUMENTATION (E)

Time : 3 Hours

Max. Marks : 100

### PART- A

Answer **all** questions. Each question carries **2 marks**.

1. What is meant by “ all or nothing law”
2. What are applications of needle electrodes?
3. Differentiate active and passive transducers with examples
4. Explain the typical waveshape of ECG
5. What is the importance of Heart rate measurement
6. Why a Loud speaker is used in EMG setup?
7. What are the waves in EEG, specify the respective frequencies also
8. What is the need of defibrillator?
9. What are the properties of X-rays
10. What is the principle of MRI scanning

(10X2=20)

### PART- B

Answer any **one full questions from each module**

#### Module – I

- 11.a) Explain the generation and propagation of action potentials in human body **10**
- b) Explain different types of surface electrodes used for the measurement of bio-potential with neat diagrams along with applications **10**

(OR)

12. a) Explain different types of pressure transducers. What are the selection features to be considered? **12**
- b) Explain how the respiration rate is measured using transducers? **8**

#### Module-II

13. a) Explain all the lead systems used in ECG recording **10**  
b) Explain the measurement of blood flow with a neat diagram **10**

**(OR)**

- 14.a) With the help of a neat diagram explain any one Direct method for the measurement of blood pressure. Also state its advantages and disadvantages **10**  
b) Explain the working of a spirometer to measure the lung volumes and capacities **10**

### **Module-III**

15. a) Explain the process of neuronal communication in human nervous system **10**  
b) Draw the block diagram of Bed side monitor and explain its operation **12**

**(OR)**

- 16.a) Explain the EEG lead system and the technique of measuring EEG with a neat block diagram **10**  
b) Draw the block schematic and explain the working of EMG machine with the features and applications **10**

### **Module-IV**

- 17.a) Describe different types of cardiac pacemakers used in medical system **10**  
b) Explain the principle and operation of CT scanner. **10**

**(OR)**

- 18.a) Explain the working of a hemo-dialysis machine **10**  
b) What is the principle of Ultrasonic imaging. What are the imaging modalities of Ultrasonic