



Reg. No. : .....

Name : .....

**Sixth Semester B.Tech. Degree Examination, May 2013  
(2008 Scheme)**

**Branch : Electrical & Electronics**

**08.606 : Elective – II (B) : BIOMEDICAL INSTRUMENTATION**

Time : 3 Hours

Max. Marks : 100

PART – A



Answer **all** questions.

1. What is the function of a sodium-potassium pump in an excitable cell ?
2. Discuss the different types of electrodes used for ECG recording.
3. List the transducers used for blood flow measurements and compare them.
4. Name the waves picked by EEG electrodes. What are the amplitudes and frequency ranges of these signals ?
5. What are korotkoff sounds ? How are they produced ?
6. What are the specification of the stimulators used for the recording of EMG ?
7. Draw the block diagram of a bed side monitor.
8. What are the applications of CT imaging ? List the possible artifacts in CT imaging.
9. What are defibrillators ? Why DC defibrillator are found to be superior to AC defibrillators ?
10. Differentiate between macro shock and micro shock. **(10×4=40 Marks)**



## PART – B

Answer **any one** question from **each** Module. **Each** question carries **20** marks **each**.

## MODULE – I

11. a) What is Nernst potential of cells ? How can the resting membrane potential be calculated empirically ?
- b) What are the different types of electrodes used in the measurement of bioelectric potentials ? Discuss the advantages and disadvantages of them.
12. a) Explain with neat sketches, a method for recording instantaneous heart rate.
- b) Compare the direct and indirect methods of blood flow measurement. Explain any one method in detail.

## MODULE – II

13. a) Sketch the section of human heart, showing clearly the electrical conduction system and explain.
- b) Explain with neat diagrams, the recording of signals using an EEG machine. Specify the characteristics of the recorder used in this machine.
14. a) Explain all the lead systems used in ECG recording.
- b) Draw the block diagram of EMG machine and describe the various blocks.
- c) Describe the working of a leads-off circuit. How does this circuit help in the ECG recorders and display systems.

## MODULE – III

15. a) Explain the X-ray machine with the help of a block diagram.
- b) What are pacemakers ? Explain in detail, the demand pacemaker with neat sketch.
16. a) With neat sketches explain ultrasonography. Compare X-ray CT, ultrasound and MR, imaging modalities.
- b) Explain a wearable artificial kidney with necessary sketches. **(20×3=60 Marks)**