

IV B.Tech II Semester Regular Examinations, Apr/May 2006
BIO MEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain how action potentials are generated in the muscles. Also explain Depolarization and Repolarization of cells.
(b) What are the different types of Bioelectric potentials generated in the body? Explain. [8+8]
2. (a) Explain clearly the following terms:
 - i. Ventricular repolarization
 - ii. Ventricular depolarization
 - iii. Atrial repolarization
 - iv. Atrial depolarization(b) Distinguish between the functioning of SA mode and AV mode. [8+8]
3. (a) What are the different interfaces established when a surface electrode is used. Explain?
(b) What is a Biochemical Transducer. Explain? [10+6]
4. (a) Describe the components of a typical EMG recording system.
(b) What are the technical differences between the recorders used for EMG and ECG? [8+8]
5. (a) Explain the lead configuration in ECG with neat sketches
(b) Draw the basic building blocks of electro cardiograph and explain. [8+8]
6. (a) Describe various types of EEG frequency responses and explain their significance.
(b) What is the difference between a normal and evoked response. [8+8]
7. (a) With the help of a neat block diagram explain the working of an external pacemaker.
(b) Write short notes on short wave diathermy. [8+8]
8. (a) Define bio telemetry? Explain the importance of biotelemetry in the modern world.
(b) What are the uses of biotelemetry. [8+8]

IV B.Tech II Semester Regular Examinations, Apr/May 2006
BIO MEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What is meant by central neurons system? Explain the different parts of it and their activity.
(b) What are bioelectric potentials? Discuss the frequency and voltage range of ECG, EEG, EMG and ERG signals. [6+10]
2. (a) With the help of a neat sketch explain the functioning of the heart.
(b) With the help of a neat diagram explain the working principle of heart lung machine. [8+8]
3. (a) Give the salient features of needle electrodes.
(b) With necessary sketches explain how contact impedance varies with electrolyte concentration and time? [8+8]
4. (a) Discuss the physiological phenomena responsible for the generation of EMG signal.
(b) Give the normal amplitude and frequency range of the EMG signal . [10+6]
5. (a) Draw the block diagram of an ECG recording system and explain its working.
(b) Give the specifications of an ECG machine. [10+6]
6. (a) Explain the working and procedure of use of an EEG machine with the help of neat diagram.
(b) Why EEG signals are different in sleeping state than those in awakening state. [8+8]
7. (a) With the help of a neat block diagram explain the working of an internal pace maker.
(b) With a neat diagram explain the operation of an Arrhythmia monitor. [8+8]
8. Write short notes on:
(a) Displays used in patient monitoring system.
(b) Calibration and repeatability of patient monitoring equipment. [8+8]

IV B.Tech II Semester Regular Examinations, Apr/May 2006
BIO MEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What is meant by central neurons system? Explain the different parts of it and their activity.
(b) What are bioelectric potentials? Discuss the frequency and voltage range of ECG, EEG, EMG and ERG signals. [6+10]
2. Write notes on any two of the following:
(a) Sources of Bioelectric potentials
(b) Electro physical properties of muscles. [8+8]
3. (a) Draw the circuit diagram of an ECG isolation amplifier and explain its working.
(b) Explain the principle of operation of a biomedical pre amplifier with neat diagram. [8+8]
4. (a) What are the different types of muscles? Explain the importance of motor unit in the muscular contraction.
(b) Discuss about the various electrodes used in EMG. [10+6]
5. (a) Explain in detail the genesis of the ECG signal.
(b) Draw and explain the Einthoven triangle and prove the Einthoven triangle. [6+10]
6. (a) What is the origin of the physiological parameter (EEG signal) measured by the EEG machine.
(b) Give the various frequency bands usually specified for EEG signals [8+8]
7. (a) What are the different modes of triggering in a Pacemaker ?
(b) Explain with a block diagram, the asynchronous pacemaker. [8+8]
8. Write short notes on:
(a) Displays used in patient monitoring system.
(b) Calibration and repeatability of patient monitoring equipment. [8+8]

IV B.Tech II Semester Regular Examinations, Apr/May 2006
BIO MEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Draw the structure of a living cell of our body and explain its constituents.
(b) Discuss the different ways of transport of ions through the cell membrane.
- [8+8]
2. (a) Explain about the non -electrical systems of the heart .
(b) What are the functions of SA node and AV node? [8+8]
3. (a) What is a Transducer? Explain its importance in biomedical instrumentation?
(b) What is the necessity of signal conditioning and processing circuits in biomedical instrumentation? [8+8]
4. (a) Describe the components of a typical EMG recording system.
(b) What are the technical differences between the recorders used for EMG and ECG? [8+8]
5. (a) Give the types of ECG recorders. Discuss any two types of recorders in detail.
(b) What is the needs for intensive-care monitoring system? Discuss the basis and essential components present in the cardiac-care unit. [8+8]
6. (a) Describe various types of EEG frequency responses and explain their significance.
(b) What is the difference between a normal and evoked response. [8+8]
7. (a) Explain the fibrillation and defibrillation in the heart and hence explain the need for defibrillation with neat circuit diagrams.
(b) Discuss the computer analysis of ECG. [10+6]
8. (a) Describe the possibilities of occurrence of electrical accidents for a patient in a hospital.
(b) What are microshocks and macroshocks? [8+8]
