Code :R7321006

1

III B.Tech II Semester(R07) Regular & Supplementary Examinations, April/May 2011
BIOMEDICAL INSTRUMENTATION
(Electronics & Instrumentation Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks

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1. (a) Explain different sources that give rise to Bio medical signals.
   (b) By way of general block diagram of a medical instrumentation system.
2. (a) Explain briefly about cell and a typical cell potential waveform.
   (b) Distinguish between polarized cell and depolarized cell.
3. (a) Distinguish between unipolar and bipolar electrodes and needleless electrodes.
   (b) Explain basic configuration of an electrode and also about calomel electrode.
4. (a) What is meant by mechanical function and electrical conduction system of heart?
   (b) Explain cardiac cycle and the relation between electrical and mechanical activities of heart.
5. (a) Explain the principle and operation of ultrasonic blood flow meter.
   (b) What is ultrasonic Doppler shift method? Explain.
6. (a) What are the requirements for implantable pacemaker? Explain.
   (b) Explain different types of pacemakers available.
7. (a) Explain the working principle of EEG and explain the different blocks of EEG.
   (b) Explain briefly about EMG used for neuro muscular condition.
8. (a) Explain briefly about dynamic respiratory parameters.
   (b) What is spirometry and explain basic water sealed spirometer used for respiratory measurements?

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Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks

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1. (a) What are the problems encountered in medical instrument system?
   (b) Distinguish between instrumentation system and biomedical instrument system.
2. (a) Distinguish between resting and action potential.
   (b) What is meant by repolarization and explain action potential waveform.
3. (a) What are the three basic types of classification of electrodes? Explain.
   (b) What are micro electrodes and body surface electrodes? Explain.
4. (a) What is heart? Explain the conduction system of heart.
   (b) Explain briefly about mechanical function and cardiac cycle of the heart.
5. (a) Explain is detail about the principle and operation of magnetic blood flow meter.
   (b) Explain briefly about indirect method of blood measurement.
6. (a) Explain different types of pacemaker.
   (b) By way of simple circuitry, explain shortwave diathermy unit.
7. (a) What are the specifications of EEG and EMG machines?
   (b) Explain briefly about electrode placement for EEG and EMG recording approaches.
8. (a) Distinguish between respirators and ventillators.
   (b) What is spirometer and explain basic spirometer used for respiratory measurements.

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BIOMEDICAL INSTRUMENTATION
(Electronics & Instrumentation Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks

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1. (a) What are the basic objectives of instrumentation system and how do you achieve there objectives-Explain.
   (b) What are the different components of medical instrumentation system?
2. (a) Explain briefly about propagation action potential and bioelectric potential.
   (b) Distinguish between absolute refractory period and relative refractory period.
3. (a) Explain briefly about electrode theory and how do you measure biopotential of two electrodes.
   (b) Explain briefly about:
      i. Disposable electrode
      ii. Ear clip electrode.
4. (a) Briefly explain about mechanical and electrical system of heart.
   (b) Explain briefly about the relation between electrical and mechanical activities of the heart.
5. (a) Explain different principles used in the measurement of blood flow meter.
   (b) How do you measure blood pressure using ultrasonic Doppler shift method?
6. (a) Explain the performance analysis of dialyzens.
   (b) Briefly explain about defibrillator.
7. (a) Give a block diagram of electro myograph set up and explain the different components.
   (b) Explain briefly about electroencephalograph.
8. (a) Distinguish between ventilation and respirator.
   (b) What is spirometry and explain basic spiremeter used for respiratory measurements.

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III B.Tech II Semester(R07) Regular & Supplementary Examinations, April/May 2011
BIOMEDICAL INSTRUMENTATION
(Electronics & Instrumentation Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks

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1. (a) What is Biocomplifin? Explain the static and dynamic characteristics of biomedical instruments.
   (b) Explain with block diagram man-instrument system.
2. (a) Distinguish between propagation rate and nerve conduction rate.
   (b) Derive Nernst equation for membrane resting potential.
3. (a) What are biomedical transducers? Explain.
   (b) What is meant by P_H value and suggest the electrode for the measurement of P_H value.
4. (a) What is heart pumping cycle and explain the cardio vascular system.
   (b) Mention the relation between electrical and mechanical activities of the heart.
5. (a) Explain the Doppler's type of ultrasonic meter for the measurement of blood flow.
   (b) Explain the Einthoven Triangle and its importance in ECG and how pre cordial unipolar leads are used it ECG.
6. (a) Explain the need for need for cardiac pacemaker.
   (b) What are the types of pacemaker available? Explain.
7. (a) Define and explain ECG, EEG and EMG.
   (b) By way of a block diagram explain the different blocks of "electromyograph".
8. (a) Explain how do you classify respirators and explain the modes of operation.
   (b) Explain briefly about ventilators.

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