Code No: RR420403 **Set No. 1**

IV B.Tech II Semester Supplimentary Examinations, May 2008
BIO MEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Draw the wave-form for the active potential and explain the same.
   (b) With neat sketch explain the terms relative refractory period and absolute refractory period. [6+10]
2. (a) Bring out the salient features of phonocardiography.
   (b) Explain in detail the origin of different heart sounds. [8+8]
3. (a) Discuss the significance of time constant, damping coefficient and frequency response with respect to biomedical transducers.
   (b) What are active and passive transducers? [10+6]
4. (a) What is bio-feedback instrumentation. Explain how it is used in ECG and EMG.
   (b) What are the differences in amplification and bandwidth requirement of amplifiers for ECG and EMG? [8+8]
5. (a) What is electrocardiogram?
   (b) Differentiate electro cardiograph from electrocardiogram
   (c) Discuss about the origin of electrocardiogram. [4+6+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) Explain in detail the defibrillation with necessary circuit and waveform.
   (b) With a neat diagram describe the working of shortwave diathermy. [8+8]
8. (a) Explain the single channel telemetry system.
   (b) Describe the working of FM Telemetry transmitter used in medical field. [8+8]

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Code No: RR420403 **Set No. 2**

IV B.Tech II Semester Supplimentary Examinations, May 2008
BIO MEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) With the help of a neat diagram explain the relationship between the action potential and muscle contraction.
   (b) What is stimulus threshold? Explain the terms absolute refractory period and relative refractory period. [6+10]
2. (a) With the help of a neat block diagram explain the principle of operation of heart lung machine.
   (b) Explain how the ECG wave form helps in assessing the functioning of the heart. [8+8]
3. (a) Give a neat classification of various electrodes used for measuring biopotentials from heart, brain and muscles.
   (b) What are the specifications of these electrodes. [10+6]
4. (a) Draw and explain a typical strength-duration curve.
   (b) Derive the expressions for rheobase and chronaxie. [8+8]
5. (a) Draw an ECG waveform and label it.
   (b) Explain in detail the different waves, segments and intervals associated with the ECG waveform. Also give their normal values. [6+10]
6. (a) Explain the clinical value of the EEG and also describe the various characteristics of an abnormal EEG.
   (b) Discuss about the type of electrodes used in the measurement of EEG and also different locations of these electrodes on the skull in order to take the EEG. [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) Describe a digital computer along with its biomedical applications.
   (b) Describe any one of the biomedical equipment controlled by a microprocessor. [8+8]

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Code No: RR420403 **Set No. 3**

IV B.Tech II Semester Supplimentary Examinations, May 2008
BIO MEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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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. Write notes on any two of the following:
   (a) Sources of Bioelectric potentials
   (b) Electro physical properties of muscles. [8+8]
3. (a) Explain any one type of amplifier used for biomedical amplification?
   (b) What are the different elements of electrostatic recorder. Explain briefly with a neat diagram? [6+10]
4. (a) Draw the block diagram and explain the recording set-up for EMG recording.
   (b) Discuss about the use of integrators in EMG. [10+6]
5. (a) Explain in detail the genesis of the ECG signal.
   (b) Draw and explain the Einthonen triangle and prove the Einthoren triangle. [6+10]
6. (a) Explain the clinical value of the EEG and also describe the various characteristics of an abnormal EEG.
   (b) Discuss about the type of electrodes used in the measurement of EEG and also different locations of these electrodes on the skull in order to take the EEG. [8+8]
7. (a) Describe the principle and working of a computer based arrhythmia monitoring system.
   (b) Explain the indirect methods of measurement of blood pressure in detail. [8+8]
8. (a) Briefly explain the different modes of ultrasonic scanning with suitable diagrams.
   (b) Describe the ultrasonic imaging systems (M-mode) with a suitable diagram. [8+8]

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Code No: RR420403 **Set No. 4**

IV B.Tech II Semester Supplimentary Examinations, May 2008
BIO MEDICAL INSTRUMENTATION
(Electronics & Communication Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe the different Physiological systems of the body.
   (b) Give an account on the different chemical compositions in the intra and extra cellular fluids and their effects in the case of blood serum. [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) Discuss the significance of time constant, damping coefficient and frequency response with respect to biomedical transducers.
   (b) What are active and passive transducers? [10+6]
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) Discuss the differences between the unipolar and bipolar types of ECG recording electrodes.
   (b) Describe the colour coding of the ECG electrodes. [10+6]
6. (a) Explain the working procedure of an EEG machine with the help of a schematic block diagram.
   (b) Why EEG signals are different in sleeping state than those in awakening state.
   (c) List the frequency ranges of various waves of EEG. [6+6+4]
7. (a) Explain in detail the defibrillation with necessary circuit and waveform.
   (b) With a neat diagram describe the working of shortwave diathermy. [8+8]
8. (a) Describe a digital computer along with its biomedical applications.
   (b) Describe any one of the biomedical equipment controlled by a microprocessor. [8+8]

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