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

IV B.Tech II Semester Regular Examinations, Apr/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 neat diagrams explain the terms Resting Potential and Active potential. How are these generated in Muscles?
   (b) With the help of sketches explain about polarized cell and depolarized cell. [8+8]

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) Mention the different biomedical electrodes and explain the desired characteristics of the same?
   (b) What is the role of half-cell potential when measuring Bioelectric signal? [10+6]

4. (a) Explain the measurement of conduction velocities in motor nerves.
   (b) Discuss any two types of FM transmitters with their merits & demerits, used for the transmission of EMG signal. [6+10]

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) 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) Compare the merits and demerits of both internal and external pace makers.
   (b) Write short notes on blood pressure monitor. [8+8]

8. (a) What is the basic principle of computerized tomography ? Explain.
   (b) Write a note on CT number scale used in CT. [8+8]

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

IV B.Tech II Semester Regular Examinations, Apr/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) What are the different types of muscles? Explain the importance of motor unit in the muscular contraction.
   (b) What is meant by central nervous system? Explain the different parts of it and their activity. [8+8]
2. (a) Bring out the salient features of phonocardiography.
   (b) Explain in detail the origin of different heart sounds. [8+8]
3. (a) Mention the different biomedical electrodes and explain the desired characteristics of the same?
   (b) What is the role of half-cell potential when measuring Bioelectric signal? [10+6]
4. (a) Explain the measurement of conduction velocities in motor nerves.
   (b) Discuss any two types of FM transmitters with their merits & demerits, used for the transmission of EMG signal. [6+10]
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) With neat circuit diagrams explain the principle of operation of the following EEG preamplifiers.
      i. Single ended preamplifier
      ii. Differential preamplifier
   (b) With neat diagrams distinguish between unipolar, average and bipolar EEG recording modes. [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. Write short notes on:
   (a) Displays used in patient monitoring system.
   (b) Calibration and repeatability of patient monitoring equipment. [8+8]

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

IV B.Tech II Semester Regular Examinations, Apr/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. (a) With the help of a neat sketch explain about the physiology of the heart.
   (b) What are the different parts and how bioelectrical potentials are generated within it? [8+8]
3. (a) Discuss the application of biochemical transducers in medical field.
   (b) What is ink jet recorder? What are the advantages of ink jet over direct writing recorder? [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 the lead configuration in ECG with neat sketches
   (b) Draw the basic building blocks of electro cardiograph and explain. [8+8]
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) 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) 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 Regular Examinations, Apr/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 neat diagrams explain the terms Resting Potential and Active potential. How are these generated in Muscles?
   (b) With the help of sketches explain about polarized cell and depolarized cell. [8+8]
2. (a) With the help of a neat sketch explain about the physiology of the heart.
   (b) What are the different parts and how bioelectrical potentials are generated within it? [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) 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) 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) With neat circuit diagrams explain the principle of operation of the following EEG preamplifiers.
      i. Single ended preamplifier
      ii. Differential preamplifier
   (b) With neat diagrams distinguish between unipolar, average and bipolar EEG recording modes. [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) What is the basic principle of computerized tomography ? Explain.
   (b) Write a note on CT number scale used in CT. [8+8]

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