Code No: 07A80403 **R07** **Set No. 2**

IV B.Tech II Semester Examinations,April/May 2012
BIOMEDICAL INSTRUMENTATION
Electronics And 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 lung volumes and capacities with suitable figures.
   (b) Define dead space. Describe the mechanism involved in the Kymograph.[8+8]
2. (a) Explain about mechanical functioning of cardiovascular system of heart.
   (b) What is a cardiac cycle? With a neat sketch explain about a cardiac cycle. [8+8]
3. (a) Explain the features of different body surface electrodes used in bio medical applications.
   (b) Explain about polarized and non- polarized electrodes. [8+8]
4. (a) Explain about different types of muscles and their electro physical properties.
   (b) Derive Nernst equation for cell membrane. [8+8]
5. (a) With an example, explain the importance of an isolation amplifier in biomedical instrumentation.
   (b) What are chopper amplifiers ? Draw a non mechanical chopper amplifier and explain its working. [8+8]
6. Explain how blood flow can be measured using electro magnetic blood flow meter. Give the advantages and disadvantages of various excitation of signals. [16]
7. Mention different types of stimulus signals used with EEG recording. [16]
8. (a) Briefly mention the therapeutic effect of heat developed by various diathermy units.
   (b) Explain the operation of a short wave diathermy units with a suitable diagram. Explain its merits and demerits over microwave diathermy. [8+8]

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Code No: 07A80403 **R07** **Set No. 4**

IV B.Tech II Semester Examinations,April/May 2012
BIOMEDICAL INSTRUMENTATION
Electronics And Communication Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Describe the functioning of a cardioverter with the help of a block diagram. [16]
2. (a) Give the salient features of needle electrodes. Give their applications.
   (b) List out various bio medical electrodes and give their applications. [8+8]
3. (a) Explain the importance of measurements in a biomedical instrumentation system.
   (b) With a neat block diagram explain about various components present in a biomedical instrumentation system. [8+8]
4. (a) With a neat sketch explain about the electrical activities of the heart
   (b) With a neat block diagram explain about cardiovascular circulation. [8+8]
5. (a) Discuss about different types of electrodes used for ECG recording.
   (b) Describe two methods for manufacturing ECG electrodes. [8+8]
6. (a) Explain normal mechanism of respiration .
   (b) Discuss about the factors responsible for gas exchange in the lungs. [8+8]
7. (a) Describe the propagation of action potential in a cell, nerve fibers, heart muscle.
   (b) List out the various types of Biopotentials originated from the Human body and brief any two with suitable figures of signals generated from them. [8+8]
8. (a) Why EEG signals are different in sleeping state than those in a wakening state?
   (b) List different types of stimulators used for recording EEG. [8+8]

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Code No: 07A80403 **R07** **Set No. 1**

IV B.Tech II Semester Examinations,April/May 2012
BIOMEDICAL INSTRUMENTATION
Electronics And 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 refractory period, absolute and relative refractory period with a help of neat sketch.
   (b) What is stimulus? How can it be transferred from one cell to other cell? [8+8]
2. (a) Explain the different wave segments of electro cardiogram. What do these correspond to?
   (b) Describe the operation of equipment used for obtaining electro cardiogram. [8+8]
3. Briefly discuss the important characteristics of various types of electrodes used for the recording of muscle potentials. Explain the working of an EMG machine with the help of block diagram. [8+8]
4. (a) What is deionizer? How is it useful for the treatment of city water?
   (b) What is acetate and bicarbonate dialysis? Discuss about the advantages and disadvantages. [8+8]
5. (a) With neat diagrams, explain the importance of chopper amplifiers in biomedical Instrumentation .
   (b) Explain briefly about the need of the amplifiers listed below in Bio-medical instrumentation.
      i. Bridge voltage amplifier
      ii. Buffer amplifier
      iii. Current amplifier [7+9]
6. (a) Explain the constructional features of micro electrodes and mention a few applications of these electrodes.
   (b) Bring out the differences between the external and internal electrodes. Give examples. [8+8]
7. (a) Bring out the relation between the electrical and mechanical activities of the heart.
   (b) Describe in detail about a heart- lung machine. [10+6]
8. Discuss about the various alarms that are used in ventilators. [16]

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Code No: 07A80403 **R07** **Set No. 3**

IV B.Tech II Semester Examinations,April/May 2012
BIOMEDICAL INSTRUMENTATION
Electronics And Communication Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Briefly explain the operation of the haemodialyser with a suitable diagram. Explain the various transducers used in its electronic controlled monitoring system. [8+8]

2. (a) Discuss in detail about cardiovascular circulation with the help of its block diagram
   (b) Describe the electrical activities of the heart. [8+8]

3. (a) With a neat constructional diagram and equivalent circuit explain the function of skin surface electrodes.
   (b) List out different types of electrodes and give their applications. [8+8]

4. (a) Draw ECG complex and lebel it. Correlate the various portions of the ECG complex to the mechanical activity of the heart.
   (b) Distinguish between PCG and ECG. [8+8]

5. What are ventilators? Which is the best one and what are the criteria for selection? [16]

6. (a) Discuss in detail about static characteristics of medical instruments.
   (b) With a neat circuit diagram explain the principle of operation of an instrumentation amplifier. Also derive the expression for voltage gain (A_v) of an instrumentation amplifier. [6+10]

7. (a) With a neat sketch explain the function of nerve cell.
   (b) What is meant by central nervous system? Explain different parts of it and their activity. [8+8]

8. (a) Discuss the design steps involved for EMG amplifiers.
   (b) Draw a neat block schematic of EMG recording system and explain its operation. [8+8]

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