Code No: RR211103 **Set No.1**

II B.Tech. I Semester Supplementary Examinations, May -2005
BIO-ELECTRICITY AND ELECTRODES
(Bio-Medical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Write short notes on:
   (a) ion selective electrode and PH glass electrode.
   (b) Donnan equilibrium and transport of ions across membranes.
2. Describe the structure and function of neurons. Add a note on myelination of neuron.
3. Discuss about the normal pacemaker of the heart and its role in conduction of heart?
4. Explain in brief the significance of Einthoven triangle?
5. What are the bioelectric sources used in volume conductor fields?
6. Explain the mechanical properties of microelectrodes?
7. (a) Explain velocity of neuromuscular signals and also their changes in velocity for normal and abnormal cases.
   (b) What is the chemical significance of conduction? Explain.
8. Explain the Electroencephalogram with a neat block diagram showing the output as EEG and input taken from the scalp electrodes? Specify the brain waves.

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Code No: RR211103 **Set No.2**

II B.Tech. I Semester Supplementary Examinations, May -2005
BIO-ELECTRICITY AND ELECTRODES
(Bio-Medical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the terms conduction, propagation and transmission in terms of nerve impulse.
   (b) Neuromuscular junction.
2. Write notes on:
   (a) threshold stimulus and action potential
   (b) Post synaptic inhibitory potential(PSIP).
3. With the help of a neat sketch explain the electromechanical activity of a human heart.
4. (a) Drawing the Einthoven's triangle, explain the electrical activity of the heart?
   (b) What do you mean by augmented limb leads?
5. What are the bioelectric sources used in volume conductor fields?
6. (a) Write a short note on various types of electrodes used to extract bio-signals?
   (b) What are physiotherapy instruments?
7. How are motor unit potentials generated? Explain.
8. What are the forward and inverse problems of bio-electric phenomenon? Discuss.

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Code No: RR211103 **Set No.3**

II B.Tech. I Semester Supplementary Examinations, May -2005
BIO-ELECTRICITY AND ELECTRODES
(Bio-Medical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Describe the electric equivalent circuit of axon. Add a note on membrane conductance.
2. Give an account of local circuit theory related to nerve impulse and explain saltatory conduction.
3. Explain the characteristics of action potentials at the following:
   (a) SA Node
   (b) Atria
   (c) AV Node
   (d) Ventricle
   (e) Purkinjee fiber.
4. Explain in brief the significance of Einthoven triangle?
5. What are the bioelectric sources used in volume conductor fields?
6. Explain the mechanical properties of microelectrodes?
7. (a) What do you mean by gradation of muscular activity? Explain.
   (b) What is chemical significance of fatigue. Explain.
8. Discuss the different waves and rhythms in Electroencephalogram. Explain.

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Code No: RR211103 **Set No.4**

II B.Tech. I Semester Supplementary Examinations, May -2005
BIO-ELECTRICITY AND ELECTRODES
(Bio-Medical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. What is refractory period and explain absolute and relative refractory periods.
2. Give an account of local circuit theory related to nerve impulse and explain saltatory conduction.
3. Explain the phases of action potential in cardiac muscle (heart) with a neat sketch? Give the action potentials at various sites of heart.
4. (a) How do you account for the greater amplitude of leadII potential in frontal limb lead ECG?
   (b) Draw a typical ECG complex and correlate.
5. What are the bioelectric sources used in volume conductor fields?
6. (a) Draw the equivalent circuits and explain the circuit properties of needle and micro Electrodes?
   (b) Mention the important characteristics of above two electrodes?
7. (a) Explain the genesis of EPP and MEPP of skeletal muscle.
   (b) Write about the size and shape of motor action potentials measured by intramuscular needle electrodes.
8. Explain the Electroencephalogram with a neat block diagram showing the output as EEG and input taken from the scalp electrodes? Specify the brain waves.

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