Code No: A109211103 **R09** **Set No. 2**

II B.Tech I Semester Examinations,MAY 2011
BIOELECTRICITY AND ELECTRODES
Bio-Medical Engineering

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the placement of electrodes used in the measurement of EEG?
   (b) Specify different EEG rhythms? Define REM. [8+7]
2. Describe the basic concepts of electro cardiography what is normal semi-permeable membrance? [15]
3. Illustrate the bio chemistry analyzers with the help of Ion-sensitive electrodes. [15]
4. Write a short note on:
   (a) Diagonostic applications of bio-electrodes
   (b) Characteristics of bio-electrodes
   (c) Electrode electrotype [5+5+5]
5. Explain the depolarization and repolarization of heart chambers with an ECG waveform? [15]
6. Explain how velocity of neuromuscular transmission is measured. Discuss the changes in velocity for normal and abnormal cases. [15]
7. (a) What is action potential? Explain the spread of potential changes in Axons.
   (b) Explain the terms membrane time and space constants. [8+7]
8. Write short notes on:
   (a) Characteristics of an impulse.
   (b) Membrane conductance. [8+7]

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Code No: A109211103 **R09** **Set No. 4**

II B.Tech I Semester Examinations,MAY 2011
BIOELECTRICITY AND ELECTRODES
Bio-Medical Engineering

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. How are motor unit potentials generated? Explain. [15]
2. How are bio-signals tapped? Explain using different electrodes? [15]
3. What are the alpha and beta rhythms in EEG? Give their normal frequency range. How is EEG used in disorders like Epilepsy for early detection? [15]
4. How are P^H measurements taken? Explain the electrodes used to tap EOG, EEG and ECG. [15]
5. (a) What do you mean by unipolar and bipolar leads?
   (b) Why a study of above two types of leads is helpful in understanding the electrical activity of heart? [8+7]
6. Discuss the physiological effects due to electric currents during bio-potential measurement. [15]
7. Write notes on:
   (a) Ion channels of biological membranes
   (b) Giant squid axonal membrane [8+7]
8. Write about Hodgkin- Huxley equations and add a note on their biological relevance. [15]

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Code No: A109211103 **R09** **Set No. 1**

II B.Tech I Semester Examinations,MAY 2011
BIOELECTRICITY AND ELECTRODES
Bio-Medical Engineering

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain the phases of action potential in cardiac muscle (heart) with a neat ketch? Give the action potentials at various sites of heart. [15]
2. Explain the characteristic features of bio-potential electrodes and their applications in medical field. [15]
3. Describe the electric properties of receptors and explain how they help in transmission of message. [15]
4. Outline types of leakage currents. List out the precautions to be taken. [15]
5. Describe the electrical equivalent circuit of axon. Add a note on membrane time in space constants. [15]
6. What is Diathermy? Explain the different types of diathermy. Write about P^H meter. [15]
7. (a) Discuss the velocity of neuromuscular transmission and their changes in normal and abnormal states.
   (b) Explain the chemical significance of fatigue? [8+7]
8. (a) Draw a simple schematic showing the output as electroencephalogram and the input taken from the scalp electrodes.
   (b) How tissue resistance helps in understanding the bio-electric phenomena? [8+7]

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Code No: A109211103 **R09** **Set No. 3**

II B.Tech I Semester Examinations,MAY 2011
BIOELECTRICITY AND ELECTRODES
Bio-Medical Engineering

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. Write a note on electrodes used in surgery. [15]
2. Explain the characteristics of action potentials of various chambers of heart? [15]
3. Illustrate the origin of EPP in MEPP of skeletal muscle. How do you measure the size in shape of motor action potentials by intra-muscular needle electrodes. [15]
4. Give the procedure for measurement of tissue resistance. Explain how it helps in understanding the bioelectric phenomena? [15]
5. What are diphasic and monophasic action potentials and explain how they are recorded. [15]
6. Illustate the Physiological effects due to magnetic fields while recording bio-potents mention the safety codes for electro medica equipments. [15]
7. (a) Draw the equivalent circuits and explain the circuit properties of needle and micro Electrodes?
   (b) Mention the important characteristics of above two electrodes? [10+5]
8. What is Nernst equation? Explain how it shows that the electrode response depends on both temperature and the no of charges on the ion. [15]

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