Code No: R050211103 **Set No. 1**

II B.Tech I Semester Regular Examinations, November 2006
BIO ELECTRICITY AND ELECTRODE
(Bio-Medical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Discribe the origin for generating bio-electricity at the cellular and sub- cellular level . [16]
2. What is Nernst equation? Explain how it shows that the electrode response depends on both temperature and the no of charges on the ion. [16]
3. Explain how propagation of an impulse is different from transmission with reference to neuroneuronal junction. [16]
4. Giving the characteristics of action potentials of components of conduction system, explain the electrical activity of heart. [16]
5. With the help of circuit diagrams and properties, explain bio potential electrodes. [16]
6. Write a short note on:
   (a) Physiotherapy instruments
   (b) Surgical instruments
   (c) P^H meter [6+5+5]
7. (a) Explain as to how you can relate motor unit potentials to the electrical activity of skeletal muscles?
   (b) What is gradation of muscular activity? [8+8]
8. (a) Explain the placement of electrodes used in the measurement of EEG?
   (b) Specify different EEG rhythms? Define REM. [8+8]

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Code No: R050211103 **Set No. 2**

II B.Tech I Semester Regular Examinations, November 2006
BIO ELECTRICITY AND ELECTRODE
(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 excited semiperineable membrane . what are the different types of transdcess used for recording biopotentials? [16]
2. Describe local excitatory state (LES) and rheobase . Explain the relation between the stimulus strength and duration. [16]
3. Describe the electric properties of receptors and explain how they help in transmission of message. [16]
4. Define "lead"? Explain the ECG leads with neat circuit diagrams. [16]
5. Explain the classification and characteristics of bio potential electrodes with the help of required waveforms and block diagrams. [16]
6. Write a short note on:
   (a) Diathermy
   (b) Blood cell counter
   (c) Ion-Sensitive electrode [6+5+5]
7. (a) Discuss the velocity of neuromuscular transmission and their changes in normal and abnormal states.
   (b) Explain the chemical significance of fatigue? [8+8]
8. (a) Explain the placement of electrodes used in the measurement of EEG?
   (b) Specify different EEG rhythms? Define REM. [8+8]

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Code No: R050211103 **Set No. 3**

II B.Tech I Semester Regular Examinations, November 2006
BIO ELECTRICITY AND ELECTRODE
(Bio-Medical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. What are bio-potentials ? Explain in detail with block diagram. [16]
2. Write short notes on
   (a) Na^+ K^+ pump.
   (b) Transmembrane potential .
   (c) Resting potential in Squid axon. [6+5+5]
3. Write notes on
   (a) threshold stimulus and action potential .
   (b) Post synaptic inhibitory potential(PSIP). [8+8]
4. (a) Highlighting the differences between unipolar limb leads and bipolar limb leads, explain them.
   (b) Give the relationship for above two leads. [8+8]
5. Explain the mechanical properties of microelectrodes? [16]
6. (a) Explain as to how and what type of electrodes are used for surgery.
   (b) Giving proper examples, explain physiotherapy and analytical instruments. [8+8]
7. (a) What are motor unit potentials.
   (b) How the motor unit potentials are helpful in neuromuscular transmission? [8+8]
8. Discuss the different waves and rhythms in Electroencephalogram. Explain. [16]

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Code No: R050211103 **Set No. 4**

II B.Tech I Semester Regular Examinations, November 2006
BIO ELECTRICITY AND ELECTRODE
(Bio-Medical Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Discuss the physiological effects due to electric currents during bio-potential measurement. [16]
2. What is refractory period and explain absolute and relative refractory periods. [16]
3. Write short notes on
   (a) a) Soup theory (Chemical transmission of impulse) .
   (b) Electric properties of synapse. [8+8]
4. Enumerate the electrical activity of the heart with the help of Einthoven's triangle. [16]
5. Discuss on needle electrodes focusing on mechanical properties. [16]
6. (a) Explain the bio-potential electrodes for surgery?
   (b) Discuss about the electrodes used for ECG, EEG and EOG. [8+8]
7. How are motor unit potentials generated? Explain. [16]
8. (a) Mention various conditions during which brain waves and rhythms in EEG are generated.
   (b) Explain the placement of electrodes in 10-20 electrode system of EEG with a neat sketch. [8+8]

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