

**III B. Tech II Semester Regular Examinations, April - 2016**  
**BIO-MEDICAL ENGINEERING**  
**(Electronics and Communication Engineering)**

Time: 3 hours

Maximum Marks: 70

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**  
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**PART -A**

- |   |                                            |      |
|---|--------------------------------------------|------|
| 1 | a) What is meant by action potential?      | [3M] |
|   | b) What is an Electrode?                   | [4M] |
|   | c) Write about the Mechanics of Breathing. | [4M] |
|   | d) What is diagnosis?                      | [4M] |
|   | e) Write about the Therapeutic Uses.       | [4M] |
|   | f) Define a Monitor.                       | [3M] |

**PART -B**

- |   |                                                                                     |       |
|---|-------------------------------------------------------------------------------------|-------|
| 2 | a) Discuss in detail the biological cell with a suitable figure.                    | [8M]  |
|   | b) Explain in detail the 'cell action potential' with the help of typical waveform. | [8M]  |
| 3 | a) Give the salient features of needle electrodes.                                  | [3M]  |
|   | b) List out various bio medical electrodes and give their applications.             | [8M]  |
|   | c) Give the applications of needle electrodes.                                      | [5M]  |
| 4 | a) With a neat block diagram explain the mechanical activities of the heart.        | [8M]  |
|   | b) Describe the electrical conduction system of a heart.                            | [8M]  |
| 5 | a) Write about the Elements of Intensive-Care Monitoring.                           | [8M]  |
|   | b) Explain about the Patient Monitoring Displays.                                   | [8M]  |
| 6 | a) Describe about the CAT Scan.                                                     | [10M] |
|   | b) Write the applications of CAT Scan.                                              | [6M]  |
| 7 | a) Explain about the various Physiological Effects.                                 | [10M] |
|   | b) Give examples of the Physiological Effects of electrical current.                | [6M]  |

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R13

SET - 2

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**PART -A**

- 1 a) What is bioelectric potential? [3M]
- b) What is the principle of transconduction? [4M]
- c) Write about the Respiratory Therapy. [4M]
- d) What are Defibrillators? [4M]
- e) Write about the Ultrasonic Imaging. [4M]
- f) Define a Recorder. [3M]

**PART -B**

- 2 a) What are the problems encountered in measuring a living system? [4M]
- b) Explain the Physiological System of the Body. [8M]
- c) What are evoked responses? [4M]
- 3 a) Write about the Electrodes for ECG. [5M]
- b) Write about the Electrodes for EEG. [5M]
- c) Explain about the Electrodes for EMG. [6M]
- 4 a) Describe the operation of ultrasonic blood flow meter. [8M]
- b) Explain why reflectance type is preferred than transmittance type. [8M]
- 5 a) With a neat diagram explain about the Calibration and Repair ability of Patient-Monitoring Equipment. [8M]
- b) Explain about the Organization of the Hospital for Patient-Care Monitoring. [8M]
- 6 a) Discuss about the MRI. [10M]
- b) Mention the applications of MRI. [6M]
- 7 a) What are Biopotential Amplifiers? Explain. [10M]
- b) What are the applications of biopotential amplifiers. [6M]

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**PART -A**

- 1 a) Mention the sources for bioelectric potential. [3M]
- b) What is Respiration sensor? [4M]
- c) Explain about Measurement of Blood Flow. [4M]
- d) What are Audiometers? [4M]
- e) Define a Radio-Isotope. [3M]
- f) What are Shock Hazards? [4M]

**PART -B**

- 2 a) What are Resting potentials? [4M]
- b) With a neat sketch explain the function of nerve cell. [8M]
- c) Write about the ECG. [4M]
- 3 a) What are pulse sensors? [3M]
- b) Explain about the Transducers for Biomedical Applications. [8M]
- c) Mention the applications of pulse sensors. [5M]
- 4 a) Explain how blood flow can be measured using electromagnetic blood flow meter. [8M]
- b) Give the advantages and disadvantages of various excitations on signals. [8M]
- 5 a) What are the advantages of lithium battery as energy source in permanent pacemaker? [8M]
- b) In what way demand pacemaker is different from stand by pacemaker. [8M]
- 6 a) Give a brief note on The Components of Biotelemetry System. [10M]
- b) Write the applications of Biotelemetry System. [6M]
- 7 a) Explain about the Isolated Power Distribution System. [10M]
- b) What are methods of accident prevention?. [6M]

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2. Answering the question in **Part-A** is compulsory

3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

- 1 a) Write about the Age of biomedical engineering. [3M]
- b) What are transducers with digital output? [4M]
- c) What is Plethysmography? [4M]
- d) What are Stimulators? [4M]
- e) Write the frequency range of ultrasonic. [4M]
- f) Define a recorder. [3M]

**PART -B**

- 2 a) What are evoked responses? [4M]
- b) Explain the features of different block of an EEG machine. [8M]
- c) List the specifications of an EEG amplifier. [4M]
- 3 a) What are Biochemical Transducers? [3M]
- b) With a neat diagram explain about the Basic Transducer Principles. [8M]
- c) Mention the applications of Biochemical Transducers. [5M]
- 4 a) Describe about the Physiology of the Respiratory System. [8M]
- b) Explain in detail various Respiratory Therapy Equipment. [8M]
- 5 a) Describe the driven RL system in the case of ECG. [8M]
- b) Why is the SA node called as natural pacemaker? [8M]
- 6 a) Discuss about the various Implantable Units. [10M]
- b) Explain how telemetry can be used for measurement of ECG during exercise. [6M]
- 7 a) What are the various Shock Hazards from Electrical Equipment? [10M]
- b) Give a brief note on Methods of Accident Prevention. [6M]

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