

III B. Tech II Semester Regular/Supplementary Examinations, April - 2018

BIO-MEDICAL ENGINEERING

(ECE and EcomE)

Time: 3 hours

Maximum Marks: 70

- 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**

PART -A

- | | | | |
|---|----|----------------------------------------------------------------|------|
| 1 | a) | What are the basic objectives of any instrumentation system? | [4M] |
| | b) | Discuss the electrode theory. | [4M] |
| | c) | What are the common accessories used in respiratory equipment? | [3M] |
| | d) | Draw any one ECG lead configuration. | [4M] |
| | e) | What is the use of Hemodialysis machine? | [4M] |
| | f) | What is the use of nebulizers and aspirators? | [3M] |

PART -B

- | | | | |
|---|----|-----------------------------------------------------------------------------------------------|------|
| 2 | a) | Draw the block diagram of man-instrument system and explain. | [8M] |
| | b) | What are the difficulties encountered in biomedical signal acquisition and analysis? Explain. | [8M] |
| 3 | a) | Discuss about the Transducers with Digital Output | [8M] |
| | b) | Draw the diagram of floating type skin surface electrode and explain. | [8M] |
| 4 | a) | Describe the ECG recorder principles. | [8M] |
| | b) | Describe the working principle of magnetic blood flow meter. | [8M] |
| 5 | a) | Describe the anatomy of vision. | [8M] |
| | b) | Distinguish between internal and external pacemakers. | [8M] |
| 6 | a) | What is ultrasonic imaging? Explain. | [8M] |
| | b) | Write notes on radio isotope instruments. | [8M] |
| 7 | a) | Discuss about Isolated Power Distribution System | [8M] |
| | b) | Write short notes on different display monitors | [8M] |



Code No: RT32045A

R13

SET - 2

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PART -A

- | | | | |
|---|----|------------------------------------------------------------------|------|
| 1 | a) | What are the different biomedical transducers? | [3M] |
| | b) | What is polarization? | [4M] |
| | c) | Draw the typical electrode placement in EEG measurement. | [3M] |
| | d) | List the color codes used for ECG electrodes? | [4M] |
| | e) | What is the difference between internal and external pacemakers? | [4M] |
| | f) | List the methods of accident prevention. | [4M] |

PART -B

- | | | | |
|---|----|--------------------------------------------------------------------------------------|------|
| 2 | a) | What are resting and action potentials? Explain. | [8M] |
| | b) | Illustrate the cross section of a depolarized cell. | [8M] |
| 3 | a) | Discuss in detail about Active transducers | [8M] |
| | b) | Write notes on pH electrode. | [8M] |
| 4 | a) | Write notes on lung volumes and capacities. | [8M] |
| | b) | Describe the mechanism of respiration. | [8M] |
| 5 | a) | What are the different patient monitoring equipment? Explain. | [8M] |
| | b) | Explain how the hospital is organized for patient-care monitoring. | [8M] |
| 6 | a) | Explain how telemetry is used for ECG measurements during exercise. | [8M] |
| | b) | Write notes on MRI. | [8M] |
| 7 | a) | Explain the working principle of bio-potential amplifiers. | [8M] |
| | b) | Explain how the isolated power distribution system is used to prevent shock hazards. | [8M] |

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PART -A

- | | | | |
|---|----|------------------------------------------------|------|
| 1 | a) | List the physiological systems of the body. | [3M] |
| | b) | Define the piezoelectric effect. | [3M] |
| | c) | What is the use of stimulators? | [4M] |
| | d) | What are the different types of ECG recorders? | [4M] |
| | e) | Define fibrillation. | [4M] |
| | f) | Define macro-shock. | [4M] |

PART -B

- | | | | |
|---|----|--------------------------------------------------------------------------|------|
| 2 | a) | What are the problems encountered in measuring a living system? Explain. | [8M] |
| | b) | What are the static characteristics of medical instrument system? | [8M] |
| 3 | a) | What are the basic types of biopotential electrodes? Explain. | [8M] |
| | b) | Explain the basic configuration of reference electrode. | [8M] |
| 4 | a) | What are the characteristics of blood flow? Explain. | [8M] |
| | b) | Describe the ECG recorder principles. | [8M] |
| 5 | a) | Distinguish between internal and external pacemakers. | [8M] |
| | b) | Explain the operation of DC defibrillator circuit. | [8M] |
| 6 | a) | What are the ultrasonic applications of therapeutic use? | [8M] |
| | b) | What is the need for biotelemetry? Explain. | [8M] |
| 7 | a) | What are the methods of prevention of shock hazards? Explain. | [8M] |
| | b) | What are the components of biotelemetry system? Explain. | [8M] |



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PART -A

- | | | | |
|---|----|-------------------------------------------------------------|------|
| 1 | a) | Define the term biometrics. | [3M] |
| | b) | List different pressure transducers. | [3M] |
| | c) | What is plethysmography? | [4M] |
| | d) | What is the use of Einthoven triangle? | [4M] |
| | e) | What is diathermy? | [4M] |
| | f) | What is the difference between micro shock and macro shock? | [4M] |

PART -B

- | | | | |
|---|----|--------------------------------------------------------------------------------|------|
| 2 | a) | What are the elements of man-instrument system? Explain. | [8M] |
| | b) | Describe the characteristics of biosignals. | [8M] |
| 3 | a) | Write notes on blood gas electrodes. | [8M] |
| | b) | Explain the term transducer and further explain about Transduction Principles. | [8M] |
| 4 | a) | What are the different types of ECG recorders? Explain. | [8M] |
| | b) | Explain the working principle of ventilators. | [8M] |
| 5 | a) | Distinguish between ac and dc defibrillation. | [8M] |
| | b) | Describe the working principle of tonometer. | [8M] |
| 6 | a) | Explain how telemetry is used for emergency patient monitoring. | [8M] |
| | b) | Explain the principle of ultrasonic measurement. | [8M] |
| 7 | a) | What are the physiological effects of electrical current? | [8M] |
| | b) | What are the methods of prevention of shock hazards? Explain. | [8M] |

