

B.Tech
(SEM VIII) THEORY EXAMINATION 2017-18
BIOMEDICAL INSTRUMENTATION

Time: 3 Hours
Total Marks: 100
Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

- 1. Attempt all questions in brief.** **2 x 10 = 20**
- a) State the Specifications of bio-medical instrumentation system.
 - b) Define the Biomedical Transducer.
 - c) What do you mean by intensive care monitoring?
 - d) Explain Vector Cardiographs.
 - e) Explain the working of Humidifier.
 - f) Explain the significance of Neuronal communication.
 - g) Explain the working principle of a Tonometer.
 - h) Describe Electro-oculogram.
 - i) Describe what are Implantable units?
 - j) Explain Emergency patient monitoring.

SECTION B

- 2. Attempt any three of the following:** **10 x 3 = 30**
- a) Explain the components of a Man-Instrumentation system. Describe the problems encountered in measuring a living system.
 - b) Differentiate between the working and functioning of a defibrillator and pace-maker. Give the classification of various pace-makers. State applications of defibrillator.
 - c) Describe the physiology of the Nervous system & the Respiratory system. Explain the working and functioning of a Spirometer.
 - d) Explain the working of Ultrasonic diagnosis techniques. Describe X-ray & Radio-isotope diagnosis.
 - e) Describe the working principle and function of a CAT-Scan machine.

SECTION C

- 3. Attempt any one part of the following:** **10 x 1 = 10**
- (a) What are Physiological potentials? Explain the meaning of the Physiological potentials: ECG, EEG, EMG, ERG and EOG.
 - (b) Describe what are Bio-potential Electrodes? Explain the difference between Electrodes and Transducers. Also explain the functioning of a Needle Electrodes and Microelectrodes.
- 4. Attempt any one part of the following:** **10 x 1 = 10**
- (a) What is Electrocardiography? Describe the components of an Electrocardiograph. Explain the ECG System for Stresses testing.

(b) Explain the elements Patient Care & intensive care Monitoring. Discuss the process of Calibration & Reparability of patient monitoring equipment.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) Describe & compare the functioning of the various Respiratory Therapy equipments like Inhalators, Ventilators & Respirators and Nebulizers & Aspirators.

(b) Explain the phenomenon of neural communication. Explain any method for Heart sound measurement.

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) What is the principle of Magnetic Resonance Imaging (MRI) system? Explain the basic components of a MRI system with the help of a suitable diagram.

(b) Explain the difference between Eco-cardiography and Eco-encephalography. Describe their application in medical field.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) What are Prosthetic Devices and Therapies? Explain the various Prosthetic Devices. Also State some applications of Lasers in medicine.

(b) What do you understand by Biotelemetry? Explain the various components of a Bio-telemetry system. Discuss the applications of Bio-telemetry system