

Code No: **RT42044D****R13****Set No. 1****IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018****BIO MEDICAL INSTRUMENTATION****(Electronics and Communications Engineering)****Time: 3 hours****Max. Marks: 70***Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B*

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**PART-A (22 Marks)**

1. a) What are the properties of cell membrane action potential? [3]
- b) What is EEG? Give its frequency bands. [4]
- c) Define IRV, ERV and TLC. [3]
- d) What are the precautions to be followed when an implantable unit is implanted? [4]
- e) Draw and explain the equipotential grounding system. [4]
- f) What are properties of Ultrasound? [4]

**PART-B (3x16 = 48 Marks)**

2. a) Explain the features of body surface electrodes with neat diagrams. [8]
- b) Explain briefly about resting and action potentials with necessary sketches. [8]
3. a) With a neat block diagram explain the mechanical activities of the heart. [8]
- b) Explain the features of plethysmography. [8]
4. a) Explain in detail the physiology of respiration. [8]
- b) With a neat diagram explain the working of a Pacemaker. [8]
5. a) List the instrumentation used in Clinical laboratory. Explain any one in detail. [8]
- b) Discuss the significance of biotelemetry. [8]
6. a) Discuss the physiological effects of electrical current. [8]
- b) With a neat figure explain the generation of Ionizing radiation. [8]
7. a) Explain the working principle of MRI with neat block diagram. [8]
- b) Explain the working and mention the medical applications of thermography. [8]

## Set No. 2

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

# BIO MEDICAL INSTRUMENTATION

**(Electronics and Communications Engineering)**

**Time: 3 hours****Max. Marks: 70**

**Question paper consists of Part-A and Part-B**

**Answer ALL sub questions from Part-A**

**Answer any THREE questions from Part-B**

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**PART-A (22 Marks)**

1. a) Draw the diagram of a neuron and mark important parts. [4]
- b) What is ECG? Draw the waveform and mention its components. [4]
- c) List the elements of Intensive care monitor. [3]
- d) List the components of biotelemetry system. [4]
- e) How focusing and depth of penetration is altered in X-ray tube? [3]
- f) Compare ultrasonic diagnosis with X-ray diagnosis. [4]

**PART-B** ( $3 \times 16 = 48$  Marks)

2. a) Give the salient features of needle electrodes. [8]  
b) Explain in detail the 'cell action potential' with the help of typical waveform. [8]
3. a) Explain how the heart sounds are measured? [8]  
b) Describe any one method used to measure blood pressure. [8]
4. a) Explain the care to be taken for instruments used in patient monitoring equipment. [8]  
b) Describe the various lung volumes and capacities. [8]
5. a) Explain how telemetry can be used for ECG measurement during exercise. [8]  
b) Discuss the significance of blood analysis in patient care. [8]
6. a) Give examples of the physiological Effects of electrical current. [8]  
b) Discuss the precautions to be taken when radioisotopes are used in instruments. [8]
7. a) Explain in detail medical tomography. [8]  
b) List the modes of ultrasonic imaging system and explain any one. [8]

Code No: **RT42044D****R13****Set No. 3****IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018****BIO MEDICAL INSTRUMENTATION****(Electronics and Communications Engineering)****Time: 3 hours****Max. Marks: 70***Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B***\*\*\*\*\*****PART-A (22 Marks)**

1. a) What is resting potential of a cell? Give typical values. [4]  
b) What is Precordial leads & how is it connected? [4]  
c) Define the following (i) Tidal volume (ii) Total lung capacity [4]  
d) What is the significance of Chemical tests? [3]  
e) Discuss what do you mean by microshock and macroshock. [4]  
f) Write the frequency range and advantages of ultrasonic imaging system. [3]

**PART-B (3x16 = 48 Marks)**

2. a) Explain in detail with neat diagram about Micro electrodes used in biomedical applications. [8]  
b) Discuss in detail the biological cell with a suitable sketches. [8]
3. a) With neat waveform explain briefly about ECG. [8]  
b) Explain how correction analysis of EEG channels is done. [8]
4. a) Draw and explain the working principle of dc defibrillator. [8]  
b) What is spirometer? Explain the principle of operation of it. [8]
5. a) Explain in detail the components of bio-telemetry system with a block diagram. [8]  
b) With a neat sketch, explain the function of Automatic blood cell counter. [8]
6. a) Explain various methods of accident prevention. [8]  
b) Explain the working of a diagnostic X Rays. [8]
7. a) Explain emission computerized Tomography. [8]  
b) Explain the principle of CAT scan and compare its visualization method with conventional method. [8]

Code No: **RT42044D****R13****Set No. 4****IV B.Tech II Semester Regular/Supplementary Examinations, April - 2018****BIO MEDICAL INSTRUMENTATION****(Electronics and Communications Engineering)****Time: 3 hours****Max. Marks: 70***Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B*

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**PART-A (22 Marks)**

1. a) What is Bio potential? Name various types of bio potential sources. [4]
- b) Why is the SA node called as natural pacemaker? [3]
- c) What are the precautions needed to be followed in intensive care monitoring? [4]
- d) What is an Endoscope? List the types of commonly available endoscopes. [4]
- e) Explain about isolated power distribution system. [3]
- f) What is MRI? List the applications of MRI. [4]

**PART-B (3x16 = 48 Marks)**

2. a) Explain the way in which a neuronal spike is evoked and transmitted from one neuron to another neuron. [8]
- b) Explain the function of Biochemical transducers. [8]
3. a) Draw the ECG waveform and explain its significance. [8]
- b) With a neat sketch, explain the Cardiovascular system. [8]
4. a) Explain about pulse sensor and respiration sensor. [8]
- b) With a block diagram, explain the working principle of an artificial respirator in various modes of operation. [8]
5. a) Explain the advantages of automation of chemical tests. [8]
- b) List the applications of Telemetry. [8]
6. a) Explain the principle and operation of X-ray machine. [8]
- b) What do you mean by Radiation therapy and give its salient features? [8]
7. a) Explain with block diagram the MRI and list its applications. [8]
- b) Explain the principle and working of CT scanning system. [8]