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
*****

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]

Code No: **RT42044D** **R13** **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
*****

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 monitory.	[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 *(3x16 = 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)	Discus 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
*****

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]