Code No: RT32045A | R13 | SET - 1

III B. Tech II Semester Regular/Supplementary Examinations, April - 2017

BIO-MEDICAL ENGINEERING

(Electronics and Communication Engineering)

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**

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PART –A

1	a)	What is the basic principle of biomedical instrumentation?	[4M]
	b)	Explain the term "Gauge factor".	[4M]
	c)	Draw the ECG amplifier.	[3M]
	d)	What is Diathermy? Explain.	[3M]
	e)	What are properties of Ultrasound?	[4M]
	f)	Explain about isolated power distribution system.	[4M]

PART -B

2	a)	How the bioelectric potentials are measured? Name some of the equipments using such measurement.	[4M]
	b)	Explain polarization, depolarization and re polarization.	[8M]
	c)	Discuss the propagation of action potentials.	[4M]
3	a)	What is the difference between active and passive transducer? Explain working principle of any active transducer.	[8M]
	b)	Explain about pulse sensor and respiration sensor.	[8M]
4	a)	Draw different ECG lead configurations and explain recording of ECG.	[8M]
	b)	Write in detail about the Respiratory therapy Equipment.	[8M]
5	a)	Compare and contrast pacemakers and defibrillators.	[8M]
	b)	What are the elements of intensive care monitoring? Explain about patient monitoring displays.	[8M]
6	a)	Explain the working principle of CT scan with neat block diagram.	[8M]
	b)	Explain the principle of CAT scan and compare its visualization method with conventional method.	[8M]
7	a)	Discuss the physiological effects of electrical current.	[8M]
	b)	Explain about the shock hazards of electrical equipment.	[8M]

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Code No: RT32045A | R13 | SET - 2

III B. Tech II Semester Regular/Supplementary Examinations, April - 2017

BIO-MEDICAL ENGINEERING

(Electronics and Communication Engineering)

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**

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PART –A

1	a)	Draw the block diagram of man-instrument system.	[3M]
	b)	What are active transducers? Explain.	[4M]
	c)	Write different clinical applications of ECG.	[3M]
	d)	Draw the block diagram of patient care monitoring system.	[4M]
	e)	What are the Noninvasive methods?	[4M]
	f)	Draw and explain the equipotential grounding system.	[4M]

PART -B

2	a)	Discuss about problems encountered in measuring a living system.	[8M]
	b)	Explain clearly about the Electromyogram (EMG).	[8M]
3	a)	Discuss four different types of transducers, explaining what they measures and their principles.	[8M]
	b)	What are the various effects of a transducer on various biomedical measurements? Discuss.	[8M]
4	a)	Discuss in detail the blood pressure measurement by indirect method.	[8M]
	b)	Draw the Plethysmograph and explain how the blood volume is recorded.	[8M]
5	a)	Explain the operation of pacemaker and why it is needed?	[8M]
	b)	What is Laparoscopy? Describe Laparoscopic system used in surgery and its benefits over normal surgery.	[8M]
6	a)	What are the components of a bio-telemetry system? What are the applications of telemetry in emergency patient monitoring?	[8M]
	b)	What is ultrasonic imaging? Compare ultrasonic diagnosis with X-ray diagnosis.	[8M]
7	a)	What are different methods of accident prevention? Discuss in detail.	[8M]
	b)	Discuss about shock hazards and their prevention methods.	[8M]

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Code No: RT32045A | R13 | SET - 3

III B. Tech II Semester Regular/Supplementary Examinations, April - 2017

BIO-MEDICAL ENGINEERING

(Electronics and Communication Engineering)

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**

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PART –A

1	a)	List the components of the Man-Instrument system.	[4M]
	b)	What is piezoelectric effect?	[4M]
	c)	Write about the Physiology of Respiratory System.	[3M]
	d)	Draw the block diagram of bedside patient monitoring system.	[3M]
	e)	What do you understand by bio-telemetry? What are its advantages?	[4M]
	f)	What are the physiological effects of electrical current?	[4M]

PART -B

2	a)	What is EEG? Why is it much more difficult to recognize than ECG? How can certain characteristic EEG Waveforms be related to sleep?	[8M]
	b)	Explain about resting and action potential.	[8M]
3	a)	List and discuss various types of transducers used for biomedical applications.	[8M]
	b)	Discuss in detail about pulse sensors?	[8M]
4	a)	What is the importance of blood flow? Discuss the biomedical instruments that are used to measure the blood flow.	[8M]
	b)	Explain the ultrasonic method of blood flow measurement.	[8M]
5	a)	What do you understand by myoelectric arms? Explain underlying principle with example.	[8M]
	b)	Explain the working principle of Electro-retinogram with a block diagram.	[8M]
6	a)	Explain how four physiological parameters are monitored and telemetered simultaneously.	[8M]
	b)	Draw the block diagram of a system to send an electrocardiogram from an ambulance to a hospital by telemetry and explain.	[8M]
7		Write short notes on the following	[8M]
		i) Isolated power distribution system	[8M]
		ii) Methods of accident prevention	

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Code No: RT32045A | R13 | SET - 4

III B. Tech II Semester Regular/Supplementary Examinations, April - 2017

BIO-MEDICAL ENGINEERING

(Electronics and Communication Engineering)

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**

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PART –A

1	a)	What are resting and action potentials?	[4M]
	b)	What is thermoelectric effect?	[3M]
	c)	What is Plethysmography?	[3M]
	d)	What are the warning devices to be used in intensive care units?	[4M]
	e)	What are the principles of Ultrasonic Measurement?	[4M]
	f)	Write about accident prevention methods.	[4M]

PART -B

2	a)	Explain the propagation of action potential with neat diagrams.	[8M]
	b)	Explain about ECG and EEG.	[8M]
3	a)	What is the difference between active and passive transducer? Explain the working of any active transducer.	[8M]
	b)	Write in detail about any two respiratory sensors.	[8M]
4	a)	Draw the Cardiovascular System and discuss various characteristic features of ECG amplifiers?	[8M]
	b)	Explain clearly the method of heart sound measurement.	[8M]
5	a)	Discuss clearly at least two Electrophysiological tests of eye.	[8M]
	b)	Name the instrument used for eye pressure measurement and explain with a neat diagram.	[8M]
6	a)	Discuss the process of Ultrasonic imaging in detail.	[8M]
	b)	Draw the Components of Biotelemetry System and explain.	[8M]
7		Write short notes on the following	[8M]
		i)Shock hazards from electrical equipment	[8M]
		ii)Physiological effects of electrical current	

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