

Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B

PART-A (10X2 = 20M)

	Marks	CO	BL
1. a) Discuss propagation of action potential in nerve fibers.	(2M)	CO1	BL2
b) Give two examples of biochemical transducers used in medical diagnosis.	(2M)	CO1	BL1
c) How are calcium ions involved in muscular contraction?	(2M)	CO2	BL2
d) Explain the frequency range and amplitude characteristics of heart sounds.	(2M)	CO2	BL2
e) What are the different ventilator modes used in the treatment of COPD patients?	(2M)	CO3	BL1
f) Describe the role of oxygen concentrators in respiratory therapy.	(2M)	CO3	BL2
g) State the function of the photomultiplier.	(2M)	CO4	BL1
h) List the important physiological parameters commonly measured using bio-telemetry systems.	(2M)	CO4	BL1
i) Draw the block diagram of an MRI system.	(2M)	CO5	BL2
j) How does positron emission help in image formation in PET scanning?	(2M)	CO5	BL2

PART-B (5X10 = 50M)

2a. Discuss the classification of bio potential electrodes with suitable applications.	5(M)	CO1	BL2
b. How does sensitivity affect the accuracy and performance of medical instruments in detecting small physiological changes?	5(M)	CO1	BL3
(OR)			
3a. Explain in detail the origin and significance of bioelectric potentials in the human body.	5(M)	CO1	BL2
b. Describe the function of sodium-potassium pumps in maintaining bioelectric potentials.	5(M)	CO1	BL2
4a. Discuss Poiseuille's law and its significance in blood flow analysis.	5(M)	CO2	BL2
b. Compare plethysmography with spirometry for measurement of lung volumes.	5(M)	CO2	BL2

(OR)

5a.	How does EMG signal correlate with the force of muscular contraction?	5(M)	CO2	BL3
b.	Derive the expression for blood flow velocity for non-invasive measurement of blood pressure using Doppler shift flow velocity meter.	5(M)	CO2	BL2
6a.	Describe the advantages and limitations of various ventilator modes used in COPD treatment.	5(M)	CO3	BL2
b.	Explain the function and applications of pulse oximeter in respiratory therapy.	5(M)	CO3	BL2
(OR)				
7a.	Distinguish between isolated and non-isolated output DC defibrillators.	5(M)	CO3	BL2
b.	Describe synchronous and asynchronous pacemaker modes with suitable examples.	5(M)	CO3	BL2
8a.	Compare wired telemetry and wireless bio-telemetry systems.	5(M)	CO4	BL2
b.	Explain how ECG can be monitored as a physiological parameter using bio-telemetry.	5(M)	CO4	BL3
(OR)				
9a.	How do automated analyzers improve accuracy and precision in chemical tests?	5(M)	CO4	BL3
b.	Draw and explain the block diagram of a superheterodyne receiver used for receiving biomedical telemetry signals.	5(M)	CO4	BL2
10a.	Describe the main components of an X-ray machine and their functions with a suitable diagram.	5(M)	CO5	BL2
b.	Explain the principle of infrared thermography in biomedical applications and derive the Stefan-Boltzmann law and discuss its significance in thermal radiation.	5(M)	CO5	BL3
(OR)				
11a.	Draw and explain the block diagram of the data acquisition system in a CT scanner.	5(M)	CO5	BL2
b.	List out the main parameters of a microbolometer? Explain each.	5(M)	CO5	BL2
