RollNo. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. (Full Time) - END SEMESTER EXAMINATIONS, APRIL / MAY 2025

Department of Electrical and Electronics Engineering
EE5028 - MEDICAL INSTRUMENTATION
(Regulation2019)

Time: 3hrs Max.Marks: 100

CO1	Able to understand the fundamental art of biomedical engineering
CO2	Able to understand the non-electrical parameters measurement and diagnostic procedures
CO3	Able to understand the concept of bio medical data acquisition and the working of EEG, ECG etc..
CO4	Able to understand about imaging modalities and analysis through computer tomography.
CO5	Able to understand the life assisting, therapeutic and robotic devices and their technical applications

BL – Bloom's Taxonomy Levels
(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20Marks)
(Answer all Questions)

Q.No.	Questions	Marks	CO	BL
1	List out the basic components of bio medical system.	2	1	1
2	State the principal of the sodium pump.	2	1	2
3	What is the pH value for blood?	2	2	2
4	What is plethysmograph?	2	2	1
5	What are the types of chopper amplifier?	2	3	1
6	Define the Einthoven Triangle.	2	3	4
7	What is an endoscopy?	2	4	2
8	Mention the most common use of MRI?	2	4	3
9	Differentiate Internal and External Pacemaker.	2	5	1
10	What is a Defibrillator?	2	5	1

PART- B(5x 13=65Marks)
(Restrict to a maximum of 2 subdivisions)

Q.No.	Questions	Marks	CO	BL
11 (a)	Discuss in detail the origin of resting and action potential with necessary equations	13	1	1
	OR			
11 (b)	Draw the layout of Cardio Vascular system and explain its functionality in detail	13	1	1
12 (a)	Explain with the help of functional diagram the working of spirometer.	13	2	2
	OR			
12 (b)	Explain the pO2 and pCO2 measurement in detail.	13	2	2
13 (a)	Draw the ECG waveform indicating typical time intervals and amplitude of the waves? Explain how these waves are physiologically correlated with heart's activity.	13	3	4
	OR			

13 (b)	What are Pre-amplifiers? Explain the working a of pre amplifier used for patient safety with neat diagram	**13**	3	4
14 (a)	Write the construction and working principle of computer tomography.	**13**	4	2
	OR			
14 (b)	Discuss in detail the different types of bio telemetry systems	**13**	4	2
15(a)	(i) Briefly discuss the block diagram of heart lung machine. (ii) State the need for defibrillator.	**7** **6**	5	4
	OR			
15 (b)	Describe the procedure for the peritoneal dialysis with a suitable diagram.	**13**	5	1

PART- C(1x 15=15Marks)

(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	Explain the application of Nano robots in medical application.	**15**	5	4