Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2024

B.E. BIOMEDICAL ENGINEERING

V Semester

BM5501 & Diagnostic and Therapeutic Equipment- I

(Regulation 2019)

Time: 3hrs

Max.Marks: 100

CO 1	Apply different medical devices in the measurement of parameters related to Cardiology, Neurology.
CO 2	Use various cardiac assist devices.
CO 3	Measure and analyse signals generated by muscles.
CO 4	Perform continuous monitoring and transmission of vital parameters.
CO 5	Comprehend the need for special diagnostic and therapeutic devices and extra-corporeal

BL – Bloom's Taxonomy Levels

(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

Q. No	Questions	Marks	CO	BL
1	Give the significance of rate responsive pacemakers.	2	1	2
2	Distinguish between monophasic and biphasic waveform in defibrillator.	2	2	4
3	Differentiate between ABR and MLR in Auditory Evoked Potentials.	2	1	4
4	Write the differences between petit mal and grand mal seizures.	2	1	4
5	Mention the significance of EGG.	2	3	2
6	Name the different types of electrodes used for EMG acquisition.	2	3	1
7	Mention the differences between Inductively coupled Biotelemetry and Optical Biotelemetry.	2	4	4
8	Write is the purpose of bed-side monitors?	2	4	2
9	Mention the key differences between bubble type and membrane type oxygenators in HLM.	2	5	4
10	Differentiate between hemodialysis and peritoneal dialysis.	2	5	4

PART- B (5 x 13 = 65 Marks)

(Restrict to a maximum of 2 subdivisions)

Q. No		Questions	Marks	CO	BL
11 (a)		Describe in detail the various cardiac abnormalities and explain how they are diagnosed from ECG.	13	2	2
		OR			
11 (b)		What is HRV? Explain the process of obtaining HRV from raw ECG.	13	2	2
12 (a)	(i)	With neat diagram explain the international 10 – 20 lead system for EEG signal acquisition.	4	1	2
	(i)	Draw the schematic diagram of an EEG machine and describe it in detail.	9	1	2
		OR			

12 (b)	Elaborate on EEG bio feedback. With necessary diagram explain the construction and working of an EEG bio feedback system.	**13**	1	2
13 (a)	Explain the construction, working and significance of the technique that is used to map the muscle activity by recording their magnetic fields.	**13**	3	2
	OR			
13 (b)	With a neat block diagram explain the working of EMG Acquisition system and various steps involved in the processing of EMG signals.	**13**	3	2
14 (a)	With neat sketches describe the working of multi-channel bio telemetry system for monitoring multiple physiological signals simultaneously.	**13**	4	2
	OR			
14 (b)	Explain the construction and working of (i) Infusion Pumps	**6**	4	2
	(ii) Disposable hematology sensors	**7**	4	2
15 (a)	Analyze the role of imaging techniques such as X-ray, ultrasound, CT scan in the planning and monitoring of lithotripsy	**13**	5	4
	OR			
15 (b)	Analyze the various applications of cryogenics in medical field.	**13**	5	4

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16	Compare the diagnostic utility of pure tone audiometry, speech audiometry, and Bekesy audiometry in assessing the hearing loss	15	5	4