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

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, APR / MAY 2025

B.E BIOMEDICAL ENGINEERING

V Semester

BM5501 DIAGNOSTIC AND THERAPEUTIC EQUIPMENT I

(Regulation2019)

Time:3hrs Max.Marks: 100

CO1	Apply different medical devices in the measurement of parameters related to cardiology, neurology.
CO2	Use various cardiac assist devices.
CO3	Measure and analyse signals generated by muscles.
CO4	Perform continuous monitoring and transmission of vital parameters.
CO5	Comprehend the need for special diagnostic and therapeutic devices and extra-corporeal devices.

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	Which portion of ECG waveform is considered as vulnerable period for fibrillation? Why?	**2**	1	2
2	Name few arrythmias related to ECG and draw few cardiac abnormal ECG waveforms.	**2**	1	1
3	Mention the types of epilepsy.	**2**	2	1
4	Write the principle of MEG.	**2**	2	2
5	Mention the characteristics of EGG signal.	**2**	3	1
6	List the various current waveforms used in nerve stimulators.	**2**	3	1
7	What is the significance of Double Modulation in Biotelemetry.	**2**	4	2
8	Draw the block diagram of central monitoring system and mark its essential components.	**2**	4	1
9	What are the conditions to be satisfied by heart lung machine?	**2**	5	2
10	Write the principle of tonometry.	**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 about types of synchronous pacemaker with neat block diagrams.	**13**	1	3
	OR			
11 (b)	i) What is fibrillation? With complete circuit explain how fibrillation can be arrested using DC defibrillator. ii) With a neat block diagram explain the working of heart rate monitor.	**6** **7**	1	3
12 (a)	What is evoked potential? Explain the visual and auditory evoked potential in detail.	**13**	2	3
	OR			
12 (b)	i) Describe with an application EEG bio feedback instrumentation.	**6**	2	3

	ii) Draw the block diagram of multichannel EEG recording system and explain each part.	**7**		
13 (a)	i) Briefly discuss about EMG biofeedback instrumentation with a clinical application. ii) Describe the sequence of actions during muscle contraction.	**7** **6**	3	4
	OR			
13 (b)	i) Explain the working of Transcutaneous Electrical Nerve Stimulator. ii) Explain how the nerve conduction velocity is measured?	**8** **5**	3	4
14 (a)	i) Describe the concepts and principles of programmed infusion pump. ii) What is point of care devices? How it will be useful in bedside monitoring?	**6** **7**	4	4
	OR			
14 (b)	Explain, with block diagrams, a typical single channel ECG biotelemetry system and multiparameter bio telemetry with a suitable example	**13**	4	4
15 (a)	Explain the construction and working of Thermographic Equipment.	**13**	5	3
	OR			
15 (b)	With neat block diagram discuss the working principle of a heart lung machine, and types of oxygenators used.	**13**	5	3

PART- C(1x 15=15Marks)

(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	Answer the following subdivisions based on Hemodialyzer i) General block diagram description ii) Types of Dialyzer membrane	**8** **7**	5	4