Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 120019

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025
Seventh Semester
Biomedical Engineering
U19BMV56 - THERAPEUTIC EQUIPMENT
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Indicate the advantage of DC defibrillator over AC defibrillator.	2	K2	CO1
2.	Define lung compliance.	2	K2	CO1
3.	Define the term 'Chronaxie' and explain its significance in assessing tissue excitability.	2	K2	CO2
4.	Identify the sequence of events in a complete gait cycle and mention its clinical relevance.	2	K1	CO2
5.	State the need for Vacuum therapy.	2	K2	CO3
6.	What is meant by Facial Rejuvenation?	2	K1	CO3
7.	Distinguish between vacuum and pneumatic techniques in dental care equipment.	2	K2	CO4
8.	List the types of dental chair.	2	K1	CO4
9.	Differentiate between spontaneous and stimulated emission.	2	K2	CO5
10.	Give the applications of CO2 laser and Nd-YAG laser in medicine.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Explain the working principle of a cardiac pacemaker. Classify pacemakers based on their operational modes and discuss the functional characteristics of each type with suitable examples.	13	K3	CO1

(OR)

	b)	Describe in detail the different mechanical modes of operation of ventilator.	13	K3	CO1
12.	a)	Explain the different types of electrodes and stimulators used in nerve and muscle stimulation. Classify them based on their design and operational principles, and discuss the roles of functional electrical stimulation (FES) and peripheral nerve stimulators in clinical and rehabilitative contexts.	13	K2	CO2
		(OR)			
	b)	Describe the operational principles and therapeutic roles of Continuous Passive Motion (CPM) units and cervical/lumbar traction machines. How do these devices aid in restoring joint mobility and alleviating musculoskeletal disorders?	13	K2	CO2
13.	a)	Discuss the various body care equipment used for aesthetic treatments and fitness regimes.	13	K2	CO3
		(OR)			
	b)	What is Deep Heat therapy? Describe its purpose and provide a detailed explanation of how the procedure is performed.	13	K2	CO3
14.	a)	Describe the components and functionalities of a dental chair, emphasizing its role in providing ergonomic support for dental procedures.	13	K2	CO4
		(OR)			
	b)	Describe the following in details: i. Low speed handpiece ii. High speed handpiece iii. Hand piece maintenance	13	K2	CO4
15.	a)	What is diathermy? Draw the circuit diagram of a short-wave diathermy unit and discuss its working principle.	13	K3	CO5
		(OR)			
	b)	Draw the block diagram of an ultrasound therapy unit and state the functions of each block. Discuss its working principle and applications.	13	K3	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	A 50 year old woman complains of chronic low back pain due to lumbar spondylosis. The doctor recommends Transcutaneous Electrical Nerve Stimulation (TENS) as part of her therapy plan.		K2	CO2
		i. Discuss how TENS can be used in this case.	3		
		ii. What type of TENS (conventional, acupuncture-like or burst mode) would be most appropriate and why?	4		
		iii. Explain the electrode placement, frequency and duration settings suitable for this patient.	4		
		iv. What physiological mechanisms underlie the pain relief?	4		

(OR)

b)	A 28 year old athlete has sustained a mild hamstring strain during a sprint event. The physiotherapist considers Microwave diathermy to promote healing and relieve pain.		K3	CO5
	i. Justify the use of microwave diathermy for this case.	3		
	ii. Draw the block diagram and explain its working principle.	4		
	iii. Compare its heating depth and tissue effects with short wave diathermy.	4		
	iv. Discuss contraindications and necessary safety checks before application.	4		