

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI EXAMINATION – SUMMER 2025

Subject Code: 3160303

Date: 22-05-2025

Subject Name: Therapeutic Instrumentation

Time: 10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Draw construction of Parallel flow dialyzers and enlist few technical specifications.	03
	(b) Enlist the parameters used to measure performance of Dialyzers. Explain any three parameters.	04
	(c) Draw and explain dialysate temperature control circuit as well as block diagram of blood leak detector used in Haemodialysis machine.	07
Q.2	(a) What is diathermy? What is the principle of High frequency heat therapy units?	03
	(b) Give detail Comparison of Short-wave diathermy and Microwave diathermy.	04
	(c) How the Ultrasonic therapy generate deep tissue heating? Explain block diagram of an ultrasonic therapy unit. How the dosage can be controlled in ultrasonic therapy?	07
	OR	
	(c) What is electrotherapy? Explain any two applications of pain relief through electrical stimulation.	07
Q.3	(a) Explain block diagram of Defibrillator analyzers.	03
	(b) In which kind of patient's situation external pacemaker is used? Explain types of external pacemakers.	04
	(c) Explain system architecture of Implantable defibrillator. Also give few technical specifications of it.	07
	OR	
Q.3	(a) Explain five letter pacemaker code.	03
	(b) Explain structure of Defibrillator electrodes.	04
	(c) Explain various pacing modalities in demand pacemakers with necessary schematics.	07
Q.4	(a) Explain major components of Drug delivery System.	03
	(b) Enlist and explain various safety aspects of Electrosurgical Diathermy.	04
	(c) Explain structure and function of heart lung machine with necessary schematic/ block diagram.	07
	OR	
Q.4	(a) Draw and explain mechanical aids used for artificial ventilation.	03
	(b) Explain working operation of stents.	04
	(c) Explain structure and functioning of Intra-aortic balloon pump (IABP).	07

- Q.5** (a) What is the need of anesthesia machine? Give the name of anesthetic agents. **03**
- (b) Explain following terms related to ventilator: **04**
1) Lung compliance 2) Minute Volume
3) Inspiratory Pause Time 4) Airway Resistance
- (c) Explain classification of ventilator in terms of various methods. **07**
- OR**
- Q.5** (a) Explain about patient breathing system of anesthesia machine. **03**
- (b) Explain about major components of Gas supply system in anesthesia machine. **04**
- (c) Explain construction and working of Baby Incubator. **07**
