Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- VII EXAMINATION-SUMMER 2023

Subject Code: 3170303 Date: 27/06/2023

Subject Name: Medical Imaging Techniques

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)**	Differentiate between Elastic and Inelastic Scattering.	**03**
	(b)	Explain Grid and Various Types of Beam restrictors in detail.	**04**
	(c)	Draw & explain block-diagram of x-ray machine & explain each block in detail.	**07**
Q.2	**(a)**	Enlist various Parameters affecting of X ray beam and Explain any One of Them.	**03**
	(b)	Explain Line Focus Principle in Detail.	**04**
	(c)	Explain X ray Interaction Methods with Matter in detail with necessary Diagram.	**07**
		OR	
	(c)	Draw and explain basic components of fluoroscopy.	**07**
Q.3	**(a)**	Describe Reflection and Refraction In context of US Propagation.	**03**
	(b)	Explain A Mode of Ultrasound with necessary Block Diagram.	**04**
	(c)	Explain Principle of CT scan. Explain various generation of it.	**07**
		OR	
Q.3	**(a)**	Describe Absorption and Scattering In context of US Propagation.	**03**
	(b)	Explain M Mode of Ultrasound with necessary Block Diagram.	**04**
	(c)	Explain Gantry as principle component of CT scan system.	**07**
Q.4	**(a)**	Define: CT Number. Give the CT Number of water, Bone and Air.	**03**
	(b)	Write a Short note on: Scintillation Detector.	**04**
	(c)	Explain single photon emission computed tomography.	**07**
		OR	
Q.4	**(a)**	What is Piezoelectric Effect?	**03**
	(b)	Write a Short note on: Gamma Camera	**04**
	(c)	Draw and Explain Construction of X Ray Tube.	**07**
Q.5	**(a)**	What is Larmor Frequency?	**03**
	(b)	During nuclear Magnetic Resonance, Explain Spin-Spin Relaxation.	**04**
	(c)	Explain working principle of magnetic resonance imaging.	**07**
		OR	
Q.5	**(a)**	Describe Biological Effects of Interaction of Static Magnetic Field with Living issue.	**03**
	(b)	During nuclear Magnetic Resonance, Explain Spin-lattice Relaxation.	**04**
	(c)	Explain in detail basic Block diagram of MRI system.	**07**

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