Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2170303 **Date:10/05/2019**

Subject Name:Medical Imaging techniques

Time:02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Describe the characteristics of X-rays.	**03**
	(b)	Explain the function of Grid and Collimator with the help of diagram.	**04**
	(c)	Explain different generation of CT-scan with neat diagram.	**07**
Q.2	**(a)**	What is Piezoelectric effect? Enlist the types of Piezoelectric materials.	**03**
	(b)	Write a short note on Fluoroscopy.	**04**
	(c)	Explain interaction between X-rays and matter with neat diagram.	**07**
		OR	
	(c)	Explain construction & working of Rotating anode X-ray tube with neat diagram.	**07**
Q.3	**(a)**	Explain the need for Time-Gain compensation in A-mode display.	**03**
	(b)	Draw & explain construction of single element Ultrasonic Transducer.	**04**
	(c)	Explain block diagram of B-mode pulse echo system in detail.	**07**
		OR	
Q.3	**(a)**	Define Attenuation, Absorption & Scattering in terms of Ultrasound.	**03**
	(b)	Explain Biological effects of Ultrasound.	**04**
	(c)	Explain Color Doppler Flow Imaging system with diagram.	**07**
Q.4	**(a)**	Describe the Biological effects of NMR imaging.	**03**
	(b)	What is CT number? Give CT number for water, air & dense material.	**04**
	(c)	Explain the principle of Magnetic Resonance Imaging technique. What are the advantages of MRI technique over other imaging techniques?	**07**
		OR	
Q.4	**(a)**	What is Computed Tomography? Give its advantages over conventional X-ray.	**03**
	(b)	Explain T1 and T2 Relaxation time.	**04**
	(c)	Explain basic NMR components in MRI.	**07**
Q.5	**(a)**	Explain the principle of Medical Thermography with its applications.	**03**
	(b)	Explain role of Radio-isotopes in medical diagnosis with applications.	**04**
	(c)	Draw & explain block diagram of Gamma camera in detail.	**07**
		OR	
Q.5	**(a)**	Write a short note on Infrared detectors used for Medical Thermography.	**03**
	(b)	Explain any two types of Nuclear Radiation detectors in brief.	**04**
	(c)	Describe SPECT scan and PET scan in brief.	**07**

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