Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER 2012

Subject code: 1723102 **Date: 31-12-2012**

Subject Name: Advanced Biomedical Imaging

Time: 10.30 am – 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.**

Q.1	**(a)**	Explain Anger position network for estimating the location at which a Particular x-ray strikes the scintillation crystal.	**07**
	(b)	Explain Instrumentation of The Gamma Camera with necessary diagram.	**07**
Q.2	**(a)**	Explain correction for attenuation effect prior to the Image reconstruction in PET.	**07**
	(b)	Explain working principle of the annihilation coincidence detection circuit used in PET.	**07**
		OR	
	(b)	Explain clinical applications of Nuclear medicine.	**07**
Q.3	**(a)**	Explain the factors that affect the X-Ray Energy Spectrum.	**07**
	(b)	Explain scanner instrumentation and detectors for computed tomography.	**07**
		OR	
Q.3	**(a)**	Explain the mechanisms that describe the interaction of X-rays with tissue.	**07**
	(b)	Explain Iterative reconstruction method for Image processing in CT scan.	**07**
Q.4	**(a)**	Explain basic illustration of Linear phased array and principle of the Time-gain compensation mechanism in Ultrasound imaging.	**07**
	(b)	Explain working principle of Magnetic Resonance Spectroscopy with its clinical applications.	**07**
		OR	
Q.4	**(a)**	Explain ultrasonic beam energy loss mechanisms in tissues.	**07**
	(b)	Explain schematics of A-mode and M-mode in Ultrasound scanning.	**07**
Q.5	**(a)**	Explain following terms related to MRI. a) Resonance b) Dephasing c) Fat suppression: STIR imaging d) Magnetic Dipole Moment	**08**
	(b)	Explain slice select gradient for MRI. How to change the slice thickness?	**06**
		OR	
Q.5	**(a)**	Explain phase encoding method used for Image construction in MRI.	**07**
	(b)	Explain working of thermal Imaging techniques with its clinical applications.	**07**

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