

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. **08**
- a) Resonance
- b) Dephasing
- c) Fat suppression: STIR imaging
- d) Magnetic Dipole Moment
- (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**
