

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – SUMMER • 2014****Subject Code: 170303****Date: 05-06-2014****Subject Name: Medical Imaging Technology****Time: 02:30 pm - 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.

- Q.1** (a) Explain interaction between sonic beam and matter with the concept of ultrasonic diagnostic. **07**
(b) Give the construction of single element ultrasonic transducer with mechanical matching and electrical matching. **07**
- Q.2** (a) Explain amplitude mode of ultrasonic diagnostic method with time gain compensation. **07**
(b) Explain construction of mechanical sector scanner with alternative design of mechanical sector scanner. **07**
- OR**
- (b) Explain determinants of biological effects of ionizing radiation and its short term and long term effects. **07**
- Q.3** (a) Write a short note on x-ray generation. **07**
(b) Draw and explain basic components of fluoroscopy. **07**
- OR**
- Q.3** (a) Enlist and explain factors that affect intensity of the x-ray beam produced. **07**
(b) Compare all generations of computed tomography. **07**
- Q.4** (a) Explain interaction of Nuclear Particles and matter. **07**
(b) Explain working principle of positron Emission Tomography with schematic diagram. **07**
- OR**
- Q.4** (a) Explain clinical use, Biological effects and safety aspects of Nuclear medical imaging. **07**
(b) Write a short note on NMR coils. **07**
- Q.5** (a) Explain following terms related to MRI. **07**
1. Magnetic Dipole moment, 2. Free Induction Decay, 3. Inversion recovery.
(b) Explain Longitudinal section tomography with neat diagram. **07**
- OR**
- Q.5** (a) Explain principle of iterative reconstruction method for image reconstruction in CT scan. **07**
(b) Write a short note on Transillumination and Infrared photography. **07**
