

GUJARAT TECHNOLOGICAL UNIVERSITY**M. E. - SEMESTER – III • EXAMINATION – WINTER • 2013****Subject code: 733101****Date: 28-11-2013****Subject Name: Functional Magnetic Resonance 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 conceptual block diagram of medical imaging process. **07**
(b) Explain the differences between structural and functional imaging techniques. **07**

- Q.2** (a) Draw and explain the schematic of a typical MRI system. **07**
(b) Enlist and explain structural imaging techniques in brief. **07**

OR

- (b) Enlist and explain functional imaging techniques in brief. **07**

- Q.3** (a) What is gradient magnetic field? Explain the need of gradient magnetic field in MRI imaging. **07**
(b) Explain in detail the T1 relaxation process for different biological materials. **07**

OR

- Q.3** (a) Explain effects of static magnetic field in MRI. **07**
(b) Explain in detail the T2 relaxation process for different biological materials. **07**

- Q.4** (a) Explain susceptibility contrast based functional magnetic resonance imaging. **07**
(b) Explain bold contrast based functional magnetic resonance imaging. **07**

OR

- Q.4** (a) Explain physiological relation of bold contrast based functional magnetic resonance imaging. **07**

- Q.4** (b) Explain physiological relation susceptibility contrast based functional magnetic resonance imaging. **07**

- Q.5** (a) Explain perfusion based functional magnetic resonance imaging. **07**
(b) Discuss Clinical applications of FMRI. **07**

OR

- Q.5** (a) Explain physiological relation of perfusion based functional magnetic resonance imaging. **07**

- (b) Discuss problems and issues related to practical use in FMRI. **07**
