

**GUJARAT TECHNOLOGICAL UNIVERSITY****M. E. - SEMESTER – III • EXAMINATION – SUMMER • 2014****Subject code: 733101****Date: 04-06-2014****Subject Name: Functional Magnetic Resonance Imaging****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 with block diagram the medical imaging process. **07**  
(b) Draw and explain the schematic of a typical MRI system. **07**
- Q.2** (a) Discuss problems related to practical use in FMRI. **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) Explain the role of gradient magnetic field in MRI. **07**  
(b) What is the effect of different biological materials in the T1 relaxation process? **07**
- OR**
- Q.3** (a) Explain the role of static magnetic field in MRI. **07**  
(b) What is the effect of different biological materials in the T2 relaxation process? **07**
- Q.4** (a) What do you mean by susceptibility? Explain susceptibility contrast based functional magnetic resonance imaging. **07**  
(b) Explain physiological relation of susceptibility contrast based functional magnetic resonance imaging. **07**
- OR**
- Q.4** (a) What do you mean by bold? Explain bold contrast based functional magnetic resonance imaging. **07**  
**Q.4** (b) Explain physiological relation bold contrast based functional magnetic resonance imaging. **07**
- Q.5** (a) What do you mean by perfusion? 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) Explain the practical parametric consideration for FMRI. **07**

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