Seat No.: _____ Enrolment No._____

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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