Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. SEMESTER III–EXAMINATION – WINTER 2015

Subject code: 2734401 Date: 04/12/2015

Subject Name: Software Radio Design

Time: 2:30 PM to 5:00 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)**	Define Software Radio. Explain basic model of Software Radio.	**07**
	(b)	Describe design principles of Software Radio.	**07**
Q.2	**(a)**	Explain the ROM compression technique used in Direct Digital Synthesis.	**07**
	(b)	Write a short note on Poly-phase filters.	**07**
		OR	
	(b)	State and prove 'Noble Identities' with reference to multi-rate signal processing.	**07**
Q.3	**(a)**	Compare Analog Signal Synthesis and Direct Digital Synthesis for waveform generation.	**07**
	(b)	Discuss various sources of spurious signals in Direct Digital Synthesis.	**07**
		OR	
Q.3	**(a)**	How the Cognitive Radio differs from Software Radio? Discuss the conceptual idea of Cognitive Radio.	**07**
	(b)	Explain benefits of smart antenna.	**07**
Q.4	**(a)**	What are the characteristics of RF receiver front end topologies? Explain any one topology in detail with necessary sketch.	**07**
	(b)	Explain Distortion characteristics of RF chain.	**07**
		OR	
Q.4	**(a)**	As a case study of Software Defined Radio, write a short note on "SPEAKeasy Phase-II".	**07**
	(b)	Write a short note on "Wireless Information Transfer System" as a case study of Software Defined Radio.	**07**
Q.5	**(a)**	Describe the application of FPGA to Software Radio. Also discuss the trade-offs in using DSP, FPGA, ASIC for Software Radio	**07**
	(b)	With reference to power management issues, describe the trade-offs among different classes of hardware for Software Radio.	**07**
		OR	
Q.5	**(a)**	Describe structures for beam forming systems	**07**
	(b)	Discuss diversity combining techniques with respect to smart antenna algorithms.	**07**

****