Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2724408 **Date: 27/05/2016**

Subject Name: Recent Trends in Modern Wireless Communication Engineering

Time:10:30 am to 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 OFDM with neat block diagrams.	**07**
	(b)	What are the criteria to select code/sequence? Explain the general block diagrams of DSSS transmitter and receiver.	**07**
Q.2	**(a)**	Explain the concept of SSM Bandwidth from Shannon's Theorem and SNR.	**07**
	(b)	A recorded conversation is to be transmitted by a pseudo noise spread spectrum system. Assume that the spectrum of the speech waveform is band-limited to 3 kHz and use 128 quantization levels. (a) Find out the chip rate required to obtain a processing gain of 30 dB. (b) Given that the sequence length is to be greater than 5 hours, find out the number of shift register stages required.	**07**
		OR	
	(b)	A direct sequence spread spectrum has a PN code rate of 192 Mcps and a binary message bit rate at 750 bps. (a) If quadriphase modulation is used, find out PG. (b) Assuming received power is 40 femto (f) watts and the one sided noise spectral density level is 16 zepto (z) W/Hz. Find the signal to noise power ratio in the input bandwidth of the receiver.	**07**
Q.3	**(a)**	List out the selection parameters for modulation in OFDM. Explain each of them in detail.	**07**
	(b)	Briefly explain concept of frequency hopping and also explain chirp spread spectrum.	**07**
		OR	
Q.3	**(a)**	Compare CDMA with OFDM and explain other variants of OFDM briefly.	**07**
	(b)	Explain signal processing at the rake receiver in detail.	**07**
Q.4	**(a)**	Define space diversity and explain the systems based on space diversity.	**07**
	(b)	Explain present trends and future of SDR	**07**
		OR	
Q.4	**(a)**	Explain space-time coding (STC) in detail.	**07**
	(b)	Explain 3G SDR system architecture.	**07**
Q.5	**(a)**	Differentiate Single User MIMO, Multi User MIMO and Multi-cell MIMO briefly.	**07**
	(b)	Explain the concept of WCDMA and compare it with 3GPP.	**07**
		OR	
Q.5	**(a)**	Define STBC and explain MIMO-OFDM system.	**07**
	(b)	Explain features of 4G and list all the possible applications of 4G.	**07**

****