Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC– SEMESTER IV– • EXAMINATION – SUMMER - 2016

Subject Code: X41101 Date:18/11/2016

Subject Name: Electronic Communication

Time:02:30 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)**	Draw and explain parallel tuned circuits in detail. Also derive equation for Resonance frequency and Q-factor for the parallel tuned Circuits.	**07**
	(b)	What is modulation? Why modulation is required? Describe in detail	**07**
Q.2	**(a)**	Explain channel effect in detail with their resources. Also explain nyquist information rate and channel capacity in detail.	**07**
	(b)	Describe Time scaling and Frequency shifting properties of Fourier transform.	**07**
		OR	
	(b)	Discuss the following: (i)Parseval's theorem (ii)Energy spectral density (iii) Power spectral density	**07**
Q.3	**(a)**	What is Envelop detector method? Explain in details. What is Diagonal peak clipping and negative peak clipping?	**07**
	(b)	A FM voltage is represented by $v=20\sin(10 \times 10^8 t + 5\cos 1250t)$ Find Carrier Frequency, Modulating Frequency, Modulation Index, Maximum Deviation, Power dissipation across 10Ω.	**07**
		OR	
Q.3	**(a)**	Explain superhetrodyne receiver in details along with the block diagram.	**07**
	(b)	Derive the expression for total power of a single tone Amplitude Modulated AM signal.	**07**
Q.4	**(a)**	What is Noise temperature and Noise factor? Also derive the equation for Noise factor of amplifier in the cascading stages	**07**
	(b)	Explain the different types of noise. Differentiate External and Internal noise.	**07**
		OR	
Q.4	**(a)**	Draw the block diagram of Tuned Radio Frequency (TRF) Receiver and Explain its operation. Describe the problems in TRF receiver.	**07**
	(b)	Two resistors 20 kΩ and 15 kΩ are at room temperature (290K) for a Bandwidth of 150kHz.Calculate thermal noise for each resistor, if two resistors are in series and if two resistors are in parallel.	**07**
Q.5	**(a)**	Draw and explain Foster seeley discriminator method.	**07**
	(b)	What is vestigial sideband modulation. Explain the generation method of it.	**07**
		OR	
Q.5	**(a)**	Explain the block diagram of Frequency Synthesizer using PLL and explain its operation. Also draw the block diagram of PLL.	**07**
	(b)	Write short notes on 1>high frequency transformer, and 2>Skin effect.	**07**

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