Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–IV • EXAMINATION – WINTER 2013

Subject Code: X41101 Date: 03-12-2013

Subject Name: Electronic Communication

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)**	Derive the expression for noise voltage due to several sources in series and parallel. Two resistors of 20 K and 50 K are at room temperature of 15 degree Celsius. for a given bandwidth of 100KHz, determine the thermal noise voltage generated by a) two resistors in series b) two resistors in parallel	**07**
	(b)	Explain pre-emphasis and De-emphasis.	**07**
Q.2	**(a)**	What is modulation? Enlist different types of modulation and define each with waveforms.	**07**
	(b)	Explain FET reactance modulator with necessary equations.	**07**
		OR	
	(b)	Explain Foster Seeley detector for FM detection with circuit and vector diagram.	**07**
Q.3	**(a)**	Explain the superhetrodyne receiver with block diagram.	**07**
	(b)	Explain envelop detector for AM demodulation. What is the effect of large value of RC time constant.	**07**
		OR	
Q.3	**(a)**	What is AGC? Explain simple AGC and delayed AGC with proper graph.	**07**
	(b)	Determine the percentage power saving when the carrier wave and one of the side-bands are suppressed in an AM wave modulated to a depth of 100%.	**07**
Q.4	**(a)**	Give comparison between AM (Amplitude modulation), FM (Frequency modulation), and PM (Phase modulation).	**07**
	(b)	List all the properties of Fourier transform. Explain duality and time scaling properties.	**07**
		OR	
Q.4	**(a)**	Find the Inverse Fourier transform of the signal: i) $\delta(\omega)$ ii) $\delta(\omega - \omega_0)$	**07**
Q.4	**(b)**	Define AM. Derive the expression for amplitude modulated wave.	**07**
Q.5	**(a)**	Give difference between SSB and DSBSC. Explain filter method with necessary block diagram.	**07**
	(b)	Explain tapped capacitor and tapped inductor.	**07**
		OR	
Q.5	**(a)**	Draw Series tuned circuit and derive equation for resonant frequency and Q-factor.	**07**
	(b)	What is noise? Define flicker noise, shot noise and partition noise	**07**

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