Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-Vth Examination December 2010

Subject code: 151004 Subject Name: Electronic Communication

Date: 18 /12 /2010 Time: 03.00 pm - 05.30 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)**	What is modulation? Why modulation is required? Describe in detail.	**07**
	(b)	What is Phase Locked Loop? Draw the block diagram of Frequency Synthesizer using PLL and explain its operation in detail.	**07**
Q.2	**(a)**	Draw the block diagram of super heterodyne AM receiver and explain its operation in detail	**07**
	(b)	Draw the block diagram of super heterodyne FM receiver and explain its operation in detail.	**07**
		OR	
	(b)	What do you mean by AGC? Draw the circuit diagram of delayed AGC and explain its operation. What are the advantages of delayed AGC?	**07**
Q.3	**(a)**	Draw parallel tuned circuit and derive the equation for resonant frequency and Q factor.	**07**
	(b)	Draw the circuit diagram of high frequency Transformer and derive the equation for transfer impedance.	**07**
		OR	
Q.3	**(a)**	Draw the circuit diagram of low frequency Transformer and derive the equation for reflected load.	**07**
	(b)	Describe briefly shot noise, partition noise and flicker noise. Why they are generated?	**07**
Q.4	**(a)**	Two resistors 10 kΩ and 25 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**
	(b)	Draw the block diagram of Tuned Radio Frequency (TRF) Receiver and explain its operation. Describe the problems in TRF receiver.	**07**
		OR	
Q.4	**(a)**	The RF amplifier working at 10 MHz has a bandwidth of 200 kHz. The input resistance of the stage is 1 kΩ with an equivalent shot noise resistance of 2 kilo-ohms. The receiver is connected to a 10 μV,75Ωsource.Calculate (1)equivalent noise voltage (2) Noise figure of the stage.	**07**
	(b)	With respect to receivers explain Image rejection and double spotting in detail.	**07**
Q.5	**(a)**	Describe the following properties of Fourier transform: (1)Time scaling(2)Frequency shifting	**07**
	(b)	With figures explain Bandwidth efficient AM (SSB-SC).	**07**
		OR	
Q.5	**(a)**	What do you mean by Tracking? Explain with figures: Padder Tracking, trimmer tracking and Three points tracking.	**07**
	(b)	The frequency span to be received by a receiver is from 525 kHz to 1650 kHz. If Cmin of tuning circuit is limited to 50 pF, Calculate the value of padder capacitor, if the maximum value of variable capacitor is 450 pF. The IF used is 465 kHz.	**07**

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