Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2019

Subject Code: 2151004 **Date: 17/06/2019**

Subject Name: Electronic and Communication

Time: 02:30 PM TO 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.**

			MARKS
Q.1	**(a)**	Explain how bandwidth of a signal (information) affects its transmission.	**03**
	(b)	Explain need of modulation.	**04**
	(c)	Explain Automatic Gain Control (AGC) and discuss difference between AGC and Delayed AGC.	**07**
Q.2	**(a)**	What is the difference between SSB and VSB wave?	**03**
	(b)	Compare : Frequency modulation and Amplitude Modulation	**04**
	(c)	The frequency span to be received by a receiver is from 525KHz to 1650KHz. If C_{min} of tuning circuit is limited to 50pF by a trimmer of 25pF, calculate the value of padder capacitor, if the maximum value of variable capacitor is 450pF. The If is 465KHz.	**07**
		OR	
	(c)	A FM voltage is represented by e_{FM}=12sin(6 x 10^8t + 5cos 1250t) Find Carrier Frequency, Modulating Frequency, Modulation Index, Maximum Deviation, Power dissipation across 10Ω.	**07**
Q.3	**(a)**	Two resistors 10 KΩ and 25 KΩ are at room temperature (300K) for a bandwidth of 150KHz. Calculate thermal noise, if two resistors are in series and if two resistors are in parallel.	**03**
	(b)	Explain the interferences in angle modulated systems.	**04**
	(c)	Explain basic principal of dual slope detector type FM demodulators.	**07**
		OR	
Q.3	**(a)**	Define : 1) Signal to noise ratio 2) Image Frequency Rejection Ratio 3) Phase modulation	**03**
	(b)	An amplifier with 10dB noise figure and 4dB power gain is cascaded with a second amplifier which has a 10dB power gain. What is the overall noise figure?	**04**
	(c)	Explain the Armstrong method of Frequency modulated signal generation.	**07**
Q.4	**(a)**	For superheterodyne receiver, Define : Sensitivity , Selectivity and Image frequency	**03**
	(b)	Explain reason and remedy for Diagonal clipping and Negative peak clipping.	**04**
	(c)	What is bandwidth efficient AM? Explain Phase shift method to generate a bandwidth efficient AM signals.	**07**
		OR	
Q.4	**(a)**	Describe the problems in TRF receiver.	**03**
	(b)	Explain the working of superheterodyne receiver with help of block diagram.	**04**
	(c)	Derive the mathematical expression of Amplitude Modulated signal and identify the spectrum of AM wave.	**07**

Q.5	**(a)**	Define : signal energy and signal power.	**03**
	(b)	Explain technology used in amateur radio.	**04**
	(c)	Derive equation for resonant frequency and Q factor for parallel tuned circuit.	**07**

OR

Q.5	**(a)**	Explain Skin effect.	**03**
	(b)	Explain the importance of HAM radio during natural calamities.	**04**
	(c)	State and prove time scaling property of Fourier transform. Explain the effect of time scaling on bandwidth of the signal.	**07**

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