Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2024

Subject Code:3154701 Date:25-11-2024

Subject Name:Electronics and Communication

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.**
4. **Simple and non-programmable scientific calculators are allowed**

			Marks
Q.1	**(a)**	Give a comparison between AM and FM systems.	**03**
	(b)	Define modulation. Describe needs of modulation process in detail.	**04**
	(c)	Draw the general block diagram of a communication system and briefly explain the function of each block.	**07**
Q.2	**(a)**	Define Following Terms: (1) Phase Modulation (2) Modulation Index (3) Distortion	**03**
	(b)	Describe briefly shot noise and partition noise with all details.	**04**
	(c)	Describe the Armstrong method for generating FM waves with help of neat diagram.	**07**
		OR	
	(c)	Explain the importance of pre-emphasis and de-emphasis circuits. Also describe functioning of pre-emphasis and de-emphasis circuits with necessary detail	**07**
Q.3	**(a)**	Describe Vestigial Sideband (VSB) modulation technique.	**03**
	(b)	Draw and explain parallel tuned circuits in detail.	**04**
	(c)	Explain the process of an SSB-SC signal generation using phase shifting method	**07**
		OR	
Q.3	**(a)**	Draw the waveforms at input and output of envelop detector.	**03**
	(b)	Draw and explain Series tuned circuits in detail.	**04**
	(c)	Two resistors, 20 kΩ and 50 kΩ are at room temperature (290K) for a bandwidth of 100kHz. Calculate thermal noise for each resistor, if two resistors are in series and if two resistors are parallel.	**07**
Q.4	**(a)**	What are the advantages of delayed AGC.	**03**
	(b)	State and explain Carson's rule for frequency modulation.	**04**
	(c)	Draw the general block diagram of a super heterodyne receiver and briefly explain the function of each block.	**07**
		OR	
Q.4	**(a)**	Discuss drawbacks of direct method for FM generation.	**03**
	(b)	Explain Phased Look Loop with all necessary details.	**04**
	(c)	List out the main functions of the communication radio receiver circuits. Also define the following terms related to radio receiver: (1) Selectivity (2) Fidelity (3) Sensitivity.	**07**
Q.5	**(a)**	Explain skin effect in detail.	**03**
	(b)	Describe utilization of HAM radio in natural calamities.	**04**
	(c)	Define noise factor and noise temperature. Derive the Friss's formulae for noise factor when amplifiers are in cascade connection.	**07**

OR

Q.5	**(a)**	State and Explain Parseval's theorem.	**03**
	(b)	Describe briefly about the HAM radio.	**04**
	(c)	Define the terms. (i) Signal Bandwidth (ii) Power Spectral Density State and prove time shifting property of Fourier transform.	**07**

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