Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:2151004 Date:09-12-2024

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)**	Explain the skin effect in brief	**03**
	(b)	Define communication. Draw The basic block diagram of communication system explain the function of each block.	**04**
	(c)	Define term modulation in context to communication process. List all the reasons of modulation required for communication	**07**
Q.2	**(a)**	Distinguish between signal energy and signal power	**03**
	(b)	Compare FM and AM processes.	**04**
	(c)	Define the teams (i) Signal Bandwidth (ii) Power Spectral Density (iii) Distortion. Also prove Frequency Shifting property of Fourier transform.	**07**
		OR	
	(c)	Explain Double sideband suppressed carrier (DSBSC) modulation with mathematical analysis	**07**
Q.3	**(a)**	State and prove Time Shifting property of Fourier Transform.	**03**
	(b)	Explain the process of an SSB-SC signal generation using phase shifting method with relevant mathematical expressions	**04**
	(c)	Determine the power content of the carrier and each of the sidebands for and AM signal having a percentage modulation of 80 % and total power of 2500 W.	**07**
		OR	
Q.3	**(a)**	With related to Amplitude modulation discuss following parameters: (i) Bandwidth requirement (ii) Power distribution in sidebands and carrier	**03**
	(b)	Draw and explain circuit of envelope detector for AM	**04**
	(c)	A 10kW carrier wave is amplitude modulated at 80% depth of modulation by a sinusoidal modulating signal. Calculate the sideband power, total power and transmission efficiency of the AM wave	**07**
Q.4	**(a)**	Discuss the interferences in angle modulated systems	**03**
	(b)	Explain the thermal noise in brief	**04**
	(c)	List all the basic FM demodulators. Draw and explain Foster Seeley Discriminator in detail	**07**
		OR	

Q.4	**(a)**	Explain the delayed AGC with diagram.	**03**
	(b)	Define noise factor and noise temperature.	**04**
	(c)	Explain Carson's rule in FM? Explain Armstrong method of FM generation	**07**
Q.5	**(a)**	Define : (i)Sensitivity (ii)Selectivity (iii) Image frequency	**03**
	(b)	Discuss drawbacks of direct method for FM generation	**04**
	(c)	Explain Super heterodyne principal and super heterodyne receiver.	**07**

OR

Q.5	**(a)**	List main function of radio receiver	**03**
	(b)	State and prove scaling property of Fourier transform.	**04**
	(c)	What is Ham radio? Discuss the importance of Ham radio during natural calamines.	**07**

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