SU.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June / July 2025 Semester End Main Examinations

Programme: B.E. **Semester: V**

Branch: Electronics & Telecommunication Engineering **Duration: 3 hrs.**

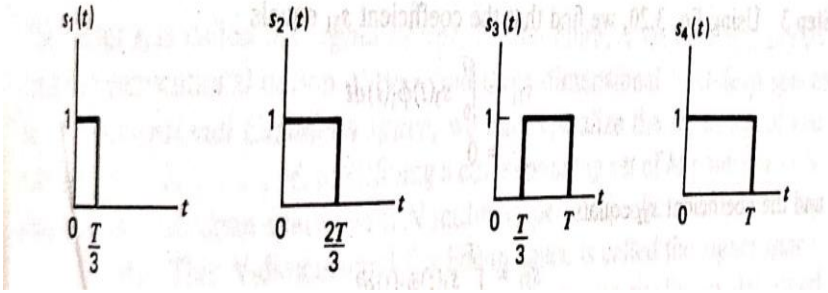
Course Code: 23ET5PCCS2 **Max Marks: 100**

Course: COMMUNICATION SYSTEM-2

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Show that the Mean and the variance of the sum of two statistically independent random variables is sum of their individual Means and Variances	*CO2*	*PO1*	**06**
	b)		Discuss the properties of Autocorrelation function of a Random process.	*CO2*	*PO1*	**08**
	c)		Derive the relation between probability and Probability density function.	*CO2*	*PO1*	**06**
			OR			
2	a)		A three digit message is transmitted over a noisy channel having a probability of error P(E) = 2/5 per digit. Find out the corresponding CDF.	*CO2*	*PO1*	**10**
	b)		Show that the total sum of the power spectral density is equal to the sum of individual power spectral densities, if the individual random process are stationary in the wide sense with zero mean and uncorrelated with each other.	*CO2*	*PO1*	**10**
			UNIT - II			
3	a)		In a broadcast superheterodyne receiver having no RF amplifier, the loaded Q of the antenna coupling circuit is 100. If the intermediate frequency is 455 KHz, calculate (i) The image frequency and its rejection ratio at 1000KHz (ii) The image frequency and its rejection ratio at 25MHz	*CO2*	*PO1*	**06**
	b)		Briefly describe the Tuned Radio Frequency receiver.	*CO1*		**08**
	c)		List the advantages of having an RF amplifier in AM receivers.	*CO1*		**06**
			OR			
4	a)		Briefly discuss the principles of Superheterodyne Receiver	*CO1*		**08**
	b)		List the major factors influencing the choice of intermediate frequency in any particular system and list the frequencies that are used.	*CO1*		**07**
	c)		Briefly describe the separately excited mixer	*CO1*		**05**

			UNIT - III			
	5	a)	Consider the signals as given below in figure **Fig5(a).** Find the orthonormal basis for this set of signals using Gram-Schmidt organalization procedure.  **Fig5(a)**	*CO2*	*PO1*	**10**
		b)	Discuss the properties of matched filter	*CO1*		**10**
			OR			
	6	a)	Derive the expression for probability of error for a Binary PSK technique.	*CO2*	*PO1*	**10**
		b)	Describe the block diagram of Binary FSK transmitter and the receiver with relevant waveforms.	*CO1*		**10**
			UNIT - IV			
	7	a)	With relevant expression, describe the DPSK receiver section.	*CO1*		**10**
		b)	Briefly describe the MSK transmitter and receiver with block diagram	*CO1*		**10**
			OR			
	8	a)	Describe the transmitter and receiver section of the QPSK modulation technique	*CO1*		**10**
		b)	Describe the GMSK transmitter and the receiver with block diagram	*CO1*		**10**
			UNIT - V			
	9	a)	List the properties of the Maximum-Length sequences and describe them	*CO2*	*PO1*	**08**
		b)	Analyse the model of direct sequence spread binary PSK system with relevant expression	*CO2*	*PO1*	**08**
		c)	A spread spectrum communication system has the following parameters: (i) Information bit duration = 4.095ms (ii) PN chip duration = 1 micro seconds Find the Processing Gain and the jamming margin	*CO2*	*PO1*	**04**
			OR			
	10	a)	Derive the expression for processing gain of spread spectrum modulation	*CO2*	*PO1*	**10**
		b)	Compare the slow and Fast frequency hopping techniques used in spread spectrum systems.	*CO2*	*PO1*	**10**

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