U.S.N.										

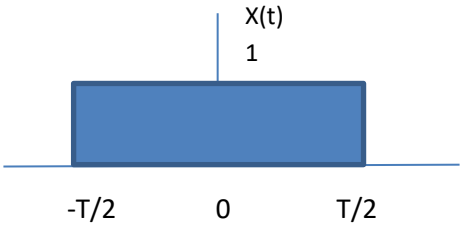
B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

December 2023 Supplementary Examinations

Programme: B.E. **Semester: IV**
Branch: Electronics and Communication Engineering **Duration: 3 hrs.**
Course Code: 22EC4PCPCS **Max Marks: 100**
Course: Principles of Communication Systems

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

			CO	PO	Marks
		UNIT - I			
1	a)	Define Amplitude Modulation. Derive the expression on AM by both time and frequency domain representations with necessary waveforms	*CO1*	*PO1*	**08**
	b)	Explain the detection of message signal from amplitude modulated signal using an envelope detector and bring out the significance of RC time constant.	*CO1*	*PO1*	**06**
	c)	An AM amplifier has Pout=50W RF output at μ=1. What is the power of unmodulated carrier? What power output is required to be delivered by the base band signal if % μ is reduced to 75%	*CO1*	*PO1*	**06**
		UNIT - II			
2	a)	Explain the method of obtaining a practical synchronous receiving system with DSB-SC modulated waves using COSTAS loop	*CO2*	*PO2*	**08**
	b)	With neat block diagram, explain the operation of Quadrature Carrier Multiplexing	-	-	**07**
	c)	For the rectangular pulse shown in fig. 1, evaluate its Hilbert transform.  Fig. 1 Rectangular Pulse	*CO1*	*PO1*	**05**
		OR			

	3	a)	Explain the Frequency Domain representation, scheme for generation and demodulation of VSB modulated wave, with relevant spectrum of signals in the demodulation scheme and relevant mathematical expressions.	*CO2*	*PO2*	**10**
		b)	Derive an expression for SSB modulated wave for which the lower sideband is retained.	*CO1*	*PO1*	**10**
			UNIT - III			
	4	a)	Derive an expression for single tone sinusoidal FM wave, find its spectrum.	*CO1*	*PO1*	**06**
		b)	Mention the properties of FM and Describe with necessary equations and block diagram, the generation of narrow band FM.	*CO1*	*PO1*	**08**
		c)	Explain how downward Frequency Translation is achieved with the help of a block diagram.	*CO1*	*PO1*	**06**
			OR			
	5	a)	Illustrate the i) FM generation using Direct method ii) Zero Crossing Detector	*CO2*	*PO2*	**12**
		b)	A 93.2 MHz carrier is frequency modulated by a 5KHz sinewave. The resultant FM signal has a frequency deviation of 40KHz. (a) Find the carrier swing of the FM signal. (b) What are the highest and lowest frequencies attained by the frequency modulated signal. (c) Calculate the modulation index for the wave.	*CO1*	*PO1*	**08**
			UNIT - IV			
	6	a)	Derive an Expression for overall equivalent noise temperature of the cascade connection of any number noises for two port network.	*CO1*	*PO1*	**04**
		b)	What is noise equivalent bandwith? Derive an expression for noise equivalent bandwith	*CO1*	*PO1*	**08**
		c)	Two resisters of 20K and 50 K are at room temperature 290 K. Calculate for the bandwidth of 100KHz, the thermal noise for the following conditions: i) For each resistor ii) For two resistors in series ii) For two resistors in Parallel	*CO1*	*PO1*	**08**
			UNIT - V			
	7	a)	Obtain the interpolation formula for reconstructing the original signal.	*CO1*	*PO1*	**12**
		b)	With a neat block diagram and waveform, explain TDM.	*CO1*	*PO1*	**08**

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