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

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

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

Branch: Electronics and Instrumentation Engineering **Duration: 3 hrs.**

Course Code: 22EI5PCCST **Max Marks: 100**

Course: 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.

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)	Define AM wave? Describe the generation of AM wave using switching modulator and sketch the waveform both time and frequency domain.	*CO2*	*PO1*	**10**
	b)	A certain transmitter radiates 8 kW with the carrier unmodulated and 10 kW, when the carrier is sinusoidally modulated. Calculate the modulation index. If another sine wave corresponding to 60% modulation is transmitted simultaneously determine the total radiated power.	*CO2*	*PO1*	**04**
	c)	Explain the reconstruction of DSB-SC signal using Costas receiver.	*CO2*	*PO1*	**06**
		OR			
2	a)	Describe the process of generation of DSB-SC signal using ring modulator and represent the relevant waveforms.	*CO2*	*PO1*	**10**
	b)	An audio frequency signal amplitude of 10V and frequency of 100Hz is amplitude modulated with carrier amplitude of 20V and frequency of 10kHz. Calculate modulation index, frequency of each side bands and bandwidth required.	*CO2*	*PO1*	**04**
	c)	With neat circuit diagram explain construction and working of the Quadrature carrier multiplexing transmitter and receiver system.	*CO2*	*PO1*	**06**
		UNIT - II			
3	a)	Summarize Wide Band Frequency modulation (WBFM) has infinite number of side bands.	*CO3*	*PO2*	**08**
	b)	Compare the Amplitude modulation and Frequency modulation techniques.	*CO2*	*PO1*	**05**

		c)	Explain demodulation of the FM wave using balanced slope detector system.	*CO2*	*PO1*	**07**
			OR			
	4	a)	With relevant diagram explain implementation of FM by PM and PM by FM.	*CO3*	*PO2*	**06**
		b)	With circuit diagram explain the generation of the NBFM signal using direct method.	*CO2*	*PO1*	**07**
		c)	Explain demodulation of the FM wave using phase locked loop system.	*CO2*	*PO1*	**07**
			UNIT - III			
	5	a)	With relevant receiver model diagram derive the figure of merit of an AM receiver with envelope detector and show that FOM is equal to $\frac{\mu^2}{2+\mu^2}$	*CO3*	*PO2*	**10**
		b)	Interpret the Pre-emphasis and De-emphasis filters improves the reconstruction of FM wave.	*CO3*	*PO2*	**10**
			OR			
	6	a)	Derive the figure of merit for an FM receiver is equal to $1.5\ \beta^2$	*CO3*	*PO2*	**10**
		b)	Explain the threshold effects of the AM and FM system.	*CO3*	*PO2*	**10**
			UNIT - IV			
	7	a)	Compare the natural sampling and flat top sampling.	*CO2*	*PO1*	**05**
		b)	With relevant diagram explain the Pulse Code Modulation (PCM) system.	*CO2*	*PO1*	**05**
		c)	Explain delta modulation system with relevant transmitter and receiver model. Sketch the waveform with slope overload distortion and granular noise.	*CO3*	*PO2*	**10**
			OR			
	8	a)	Explain briefly on quantization process in digital communication.	*CO2*	*PO1*	**05**
		b)	With relevant block diagram explain the DPCM system.	*CO2*	*PO1*	**08**
		c)	With circuit diagram explain the generation of the PAM signal.	*CO3*	*PO2*	**07**
			UNIT - V			
	9	a)	With suitable transmitter and receiver diagram explain the BPSK modulation, write the corresponding waveform and constellation diagram.	*CO4*	*PO3*	**10**
		b)	Sketch the waveform of the ASK and BFSK modulation for the given binary data {1 0 0 1 0 1 0 0 0 1 0 1} and write	*CO4*	*PO3*	**05**

			corresponding constellation diagram.			
		c)	Discuss Frequency Division Multiple Access (FDMA) technique in first generation cellular system.	*CO4*	*PO3*	**05**
			OR			
	10	a)	Given m (n) = {0 1 1 0 1 0 0 0}, sketch a suitable QPSK waveform and explain transmitter and receiver system.	*CO4*	*PO3*	**10**
		b)	Explain the transmitter of the DPSK modulator.	*CO4*	*PO3*	**05**
		c)	Describe the Time Division Multiple Access (TDMA) in second generation cellular system.	*CO4*	*PO3*	**05**

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