CBCS SCHEME - Make-Up Exam

BEC402

Fourth Semester B.E/B.Tech. Degree Examination, June/July 2025
Principles of Communication Systems

Time: 3 hrs. Max. Marks:100

Note: *1. Answer any FIVE full questions, choosing ONE full question from each module.*
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
1	a.	Define the Auto correlation and Cross correlation. Discuss the properties of auto correlation.	10	L2	CO5
	b.	Define Probability. Illustrate the relationship between sample space , event and probability.	5	L2	CO5
	c.	Develop a program to generate the probability density function of Gaussian distribution function.	5	L3	CO5
		OR			
2	a.	Explain Conditional Probability. Prove that P(B/A) = P(A/B) . P(B) / P(A).	6	L2	CO5
	b.	Explain Central Limit Theorem as applied to Gaussian Random Process.	6	L2	CO5
	c.	Explain properties of Gaussian Process with necessary equations.	8	L3	CO5
		Module – 2			
3	a.	Write a MATLAB code to generate Amplitude Modulation and demodulation waveforms and display its spectrums.	8	L3	CO2
	b.	Explain the working principle of lattice type balanced modulator with neat circuit diagram.	8	L2	CO2
	c.	Ab AM transmitter has a carrier power of 30 W. The % of modulation is 85%. Calculate a) P_t b) P_{SB} in one side band	4	L3	CO2
		OR			
4	a.	Explain how amplitude modulated wave generated using diode modulator.	8	L2	CO2
	b.	Explain the working of transmitter and receiver of Frequency Division Multiplexing (FDM).	8	L2	CO2
	c.	Explain disadvantages of DSB and SSB.	4	L2	CO2

		Module – 3			
5	a.	Define PLL. Explain with neat circuit diagram of FM demodulator using IC 565.	8	L2	CO2
	b.	Explain the demodulation process of frequency modulator using slope detector.	8	L2	CO2
	c.	What is the maximum Band width of an FM signal with a deviation of 30 KHz and a maximum modulating signal of 5KHz. Determine i) M.I ii) Bandwidth.	4	L3	CO2
		OR			
6	a.	Draw the block diagram of a super heterodyne receiver and explain the function of each block.	8	L2	CO2
	b.	Explain the Noise suppression effects of FM with necessary waveform.	6	L2	CO2
	c.	Compare Amplitude Modulation (AM) versus Frequency Modulation (FM).	6	L2	CO2
		Module – 4			
7	a.	What is quantization process? Derive output signal to noise ratio of uniform quantizer $(SNR)_0 = \left(\frac{3P}{m_{max}}\right) \cdot 2^{2R}$ Where P average power of m(t).	10	L3	CO3
	b.	Explain the Regeneration of PCM waves with a neat block diagram.	5	L2	CO3
	c.	Explain important advantages of digital signals over analog signals.	5	L2	CO3
		OR			
8	a.	Explain the generation and detection of PPM wave with neat diagram.	10	L2	CO3
	b.	An analog signal is specified by the equations : i) $x(t) = 3\cos(50\pi t) + 10\sin(300\pi t) + \cos(100\pi t)$ ii) $x(t) = \frac{1}{2\pi}\cos(4000\pi t) \cdot \cos(1000\pi t)$.	10	L3	CO3
		Module – 5			
9	a.	Define ISI. Explain base band binary data transmission with beat block diagram and necessary equations.	10	L2	CO4
	b.	Explain the different types of external and internal noise.	5	L2	CO4
	c.	Write a note on Eye diagram.	5	L2	CO4
		OR			

10	a.	Explain the following concept briefly : i) Nyquist criterian for distrotionless transmission ii) Base band M – array PAM transmission iii) Band width requirement of T_1 system.	12	L2	CO4
	b.	With a neat diagram, explain the concept of noise in cascaded stages. Write Friis formula and mention its terms.	8	L2	CO4

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