

CBCS SCHEME

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BEC402

Fourth Semester B.E/B.Tech. Degree Examination, Dec.2025/Jan.2026 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 and cross correlation.	10	L1	CO1
	b.	Define probability with an example. Discuss their properties.	5	L1	CO1
	c.	Develop a problem to generate the probability density function of Gaussian distribution function.	5	L2	CO1
OR					
2	a.	Determine the characteristic function of a Gaussian random variable with a given mean and variance.	8	L2	CO1
	b.	What is conditional probability? Prove that $P(B/A) = P(A/B) \cdot P(B)/P(A)$.	6	L3	CO1
	c.	Define auto covariance, random variable and probability distribution function.	6	L1	CO1
Module – 2					
3	a.	Derive the expression for Amplitude Modulation (AM) power in terms of modulation index.	7	L3	CO2
	b.	Write G Matlab code to generate amplitude modulation and demodulation wave forms and display its spectrum.	8	L3	CO2
	c.	Explain with neat diagrams, AM demodulator using the diode detector.	5	L2	CO2
OR					
4	a.	An AM transmitter has a carrier power of 30W. The percentage of modulation is 85%. Calculate : i. The total power ii. The power in one sideband.	5	L3	CO3
	b.	Explain a general block diagram of an FDM system.	10	L2	CO3
	c.	Explain amplitude modulation in time domain with necessary waveforms.	5	L2	CO3

Module – 3

5	a.	Define PLL, explain with neat diagram of FM demodulator using the IC 565.	10	L2	CO3
	b.	With neat block diagram, explain the concept of frequency modulation with an IC voltage controlled oscillator (ICNE 566).	10	L2	CO3

OR

6	a.	Draw the block diagram of a super heterodyne receiver and explain the function of each block.	10	L2	CO3
	b.	Explain with a neat diagram, the frequency spectrum of FM wave.	10	L2	CO3

Module – 4

7	a.	What is quantization process? Explain the different types of quantization with their important characteristics.	10	L2	CO4
	b.	For the data stream 110011. Draw the following line code waveforms. i. Unipolar RZ ii. Unipolar NRZ iii. Polar NRZ iv. Bipolar NRZ v. Manchester NRZ.	10	L3	CO4

OR

8	a.	Explain the generation and detection of PPM waves with a relevant block diagram.	10	L2	CO4
	b.	What is multiplexing and why it is required in communication? Explain the working of TDM with a neat block diagram.	10	L2	CO4

Module – 5

9	a.	Define ISI. Out line base band binary data transmission system with neat block diagram and equations.	10	L2	CO5
	b.	Discuss about Nyquist criterion for distortionless (zero ISI) base band transmission.	10	L2	CO5

OR

10	a.	Explain in detail about Internal and External noise.	10	L2	CO5
	b.	Develop a code to generate and plot eye diagram.	6	L2	CO5
	c.	An RF amplifier has an S/N ratio of 8 at the i/p and S/N 6 at the o/p. What are the Noise Ratio and Noise Figure?	4	L3	CO5
