Code No.: R22EC402PC	R22	H.T.No.			8	R						

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–II–Semester End Examinations (Regular) -June- 2025
ANALOG AND DIGITAL COMMUNICATIONS
(ECE)

[Time: 3 Hours] **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(10 Marks)**

1.	a)	What does a Phase Locked Loop (PLL) track in FM detection?	[1M]
	b)	What is the main advantage of SSB over DSB-SC?	[1M]
	c)	What is the key principle behind the Armstrong method of FM generation?	[1M]
	d)	What is the purpose of a balanced slope detector?	[1M]
	e)	In FM receivers, what is the role of the discriminator?	[1M]
	f)	What is the main function of a transmitter in a communication system?	[1M]
	g)	What is quantization noise?	[1M]
	h)	How is quantization noise related to the number of bits per sample?	[1M]
	i)	What is the primary cause of ISI in digital communication?	[1M]
	j)	What is the function of an eye diagram?	[1M]

PART-B **(50 Marks)**

2.	Describe Amplitude Modulation in both time and frequency domains. Derive expressions for the modulated wave and explain the bandwidth requirements.	[10M]
	OR	
3.	Describe the generation and reception of Coherent Detection of DSB-SC modulated waves.	[10M]
4.	Prove that the average transmitted power in an FM wave remains constant irrespective of modulation index. What implications does this have for signal transmission?	[10M]
	OR	
5.	What is the need for Pre-emphasis and De-emphasis in FM transmission? Explain their working with appropriate frequency response characteristics.	[10M]
6.	Explain the principle and need for amplitude limiting in FM receivers. How does it help in reducing the effect of amplitude noise?	[10M]
	OR	
7.	Compare AM and FM receivers in terms of complexity, noise immunity, selectivity, and fidelity.	[10M]
8.	Explain the need for non-uniform quantization in PCM. What is companding? Discuss μ-law and A-law companding techniques.	[10M]
	OR	
9.	Describe the working of Delta Modulation (DM). Explain the concepts of slope overload distortion and granular noise with suitable waveforms.	[10M]

10. Explain the concept of probability of error in digital communication systems. Derive the expression for Bit Error Rate (BER) for BPSK over AWGN channel. [10M]

OR

11. Explain the principle of Coherent BPSK detection. Draw the block diagram and how carrier recovery is essential for coherent demodulation? [10M]

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