Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 70012

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025
Seventh Semester
Computer Science and Engineering
U19ECOE7 – BASICS OF COMMUNICATION SYSTEMS
(Common to EEE, CST & BT)
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define Modulation and state the reasons for its use in communication.	2	K1	CO1
2.	Distinguish between Amplitude modulation and Frequency Modulation.	2	K2	CO1
3.	What do you mean by bandwidth efficiency?	2	K2	CO2
4.	Draw the waveforms of binary ASK for the bit sequence 10110.	2	K1	CO2
5.	Mention the limitations half-duplex over full-duplex communication.	2	K1	CO3
6.	Give two applications of digital communication.	2	K1	CO3
7.	Differentiate between Pulse Width Modulation (PWM) and Pulse Position Modulation (PPM).	2	K2	CO4
8.	State the sampling theorem.	2	K1	CO4
9.	Mention the needs of cellular system frequency reuse techniques.	2	K2	CO5
10.	Name two types of channel assignment strategies.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Write a detailed note on various techniques used for the generation of Amplitude Modulation Signals.	13	K2	CO1
		(OR)			
	b)	For an FM modulator with a modulating signal $m(t) = Vm \sin(300\times10^3 t)$, the carrier signal $Vc(t) = 8 \sin(6.5\times10^6 t)$ and the modulation index = 2. Find out the significant side band frequencies and their amplitudes.	13	K2	CO1
12.	a)	What is QPSK? Explain its principle with a block diagram, signal constellation, and waveforms for bit pairs.	13	K2	CO2
		(OR)			
	b)	Discuss the working principle of Differential Phase Shift Keying (DPSK) with block diagram, calculate the probability of error for DPSK and compare it with BPSK.	13	K2	CO2
13.	a)	Explain in detail about error detection and correction techniques with an example Data block.	13	K2	CO3
		(OR)			
	b)	Explain RS-232 protocol along with its pin configuration, working mechanism, and drawbacks.	13	K2	CO3
14.	a)	Describe the working principle of Pulse Code Modulation (PCM) with a neat block diagram, and also explain about the uniform and Non uniform quantization.	13	K2	CO4
		(OR)			
	b)	Illustrate the principle of Pulse Amplitude Modulation (PAM). Derive its expression and discuss the difference between natural sampling PAM and flat-top sampling PAM with waveforms.	13	K2	CO4
15.	a)	Analyze the cellular concept in mobile communication, with a neat diagram, describe the frequency reuse technique and its advantages.	13	K2	CO5
		(OR)			
	b)	Describe the process of soft handoff in CDMA. Why it is more efficient compared to hard handoff in FDMA and TDMA?	13	K2	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	A carrier of 10 V amplitude and 1 MHz frequency is amplitude modulated by a 5 kHz sinusoidal signal with 80% modulation.		K2	CO1
		i. Derive the expression for the AM wave.	5		
		ii. Draw its waveform and spectrum.	3		
		iii. Calculate the total power transmitted, power in the carrier, and power in the sidebands.	7		
		(OR)			
	b)	A cellular system has a total bandwidth of 25 MHz, divided into 25 kHz channels.		K2	CO5
		i. Calculate the number of available channels.	5		
		ii. If a cluster size of N = 4 is used, determine the number of channels per cell.	5		
		iii. Discuss the effect of frequency reuse and cell splitting on system capacity.	5		