Reg. No.															

Question Paper Code	13535

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Fourth Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

20EIPC402 - PRINCIPLES OF COMMUNICATION ENGINEERING

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	The bandwidth of an AM signal is: (a) Equal to modulating frequency (b) Twice the modulating frequency (c) Half the modulating frequency (d) Equal to carrier frequency	1	K1	CO1
2.	The purpose of local oscillator in receiver is to: (a) Increase gain (b) Convert input frequency to IF (c) Reduce noise (d) Demodulate signal	1	K1	CO1
3.	A typical line coding scheme is: (a) AM (b) NRZ (c) FM (d) PCM	1	K1	CO2
4.	In TDM, guard time is used to: (a) Avoid interference between adjacent signals (b) Increase data rate (c) Reduce power (d) Improve sampling	1	K1	CO2
5.	The main disadvantage of M-ary modulation is: (a) Requires large bandwidth (b) Requires high SNR (c) Low bit rate (d) Complex sampling	1	K1	CO3
6.	Raised cosine filter is used to: (a) Increase bandwidth (b) Reduce ISI (c) Increase amplitude (d) Reduce phase shift	1	K1	CO3
7.	Error control coding is used to: (a) Detect errors only (b) Correct errors only (c) Detect and correct errors (d) Eliminate errors	1	K1	CO4
8.	Cyclic codes are a subset of: (a) Block codes (b) Convolution codes (c) Huffman codes (d) Prefix codes	1	K1	CO4
9.	Pseudo-Noise (PN) sequence is: (a) Truly random (b) Deterministic but appears random (c) Generated by noise source (d) A random analog signal	1	K1	CO5
10.	In FDMA, users share: (a) Same frequency band in different time slots (b) Different frequency bands simultaneously (c) Same time slot in same frequency (d) Same code in same frequency	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Identify the modulation scheme for television signal transmission.	2	K2	CO1
12.	Define angle modulation.	2	K1	CO1
13.	Differentiate DSBSC and SSBSC.	2	K2	CO1
14.	Summarize the need of Line Codes.	2	K2	CO2

15.	Write the advantages of delta modulator.		*2*	*K1*	*CO2*
16.	Recall quantization.		*2*	*K1*	*CO2*
17.	What is inter-symbol interference (ISI)?		*2*	*K1*	*CO3*
18.	Define eye diagram.		*2*	*K1*	*CO3*
19.	Why is Huffman code called as minimum redundancy code?		*2*	*K1*	*CO4*
20.	Mention the main idea of channel capacity.		*2*	*K1*	*CO4*
21.	Differentiate slow and fast frequency hopping.		*2*	*K2*	*CO5*
22.	What is a PN sequence?		*2*	*K1*	*CO5*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Describe the concepts of AM modulation and derive the equation of an AM wave. Draw the phasor diagram, spectrum and modulated AM wave for various degrees of modulation index.	*11*	*K3*	*CO1*
		OR			
	b)	Describe the block diagram of the super heterodyne receiver with a neat block diagram.	*11*	*K3*	*CO1*
24.	a)	For the following bit sequence 1101010011 draw the waveforms for RZ unipolar, NRZ polar, AMI, Manchester, RZ polar and NRZ line coding techniques.	*11*	*K3*	*CO2*
		OR			
	b)	Describe the delta modulation system in detail with a neat block diagram. Also, illustrate the two forms of quantization error in delta modulation.	*11*	*K3*	*CO2*
25.	a)	Explain the operation of a QPSK modulator with a neat diagram. Draw its phasor and constellation diagram.	*11*	*K2*	*CO3*
		OR			
	b)	Explain the power spectral density and bandwidth of QAM signal with neat diagrams and mention its advantages.	*11*	*K2*	*CO3*
26.	a)	Derive the expression for entropy, also state and prove the properties of entropy.	*11*	*K3*	*CO4*
		OR			
	b)	A source emits one of four symbols S1, S2, S3 and S4 with probabilities {1/3, 1/6, 1/4, 1/4}. Calculate entropy, average code word length and coding efficiency using Huffman coding.	*11*	*K3*	*CO4*
27.	a)	Describe the Frequency division multiple access technique in detail.	*11*	*K2*	*CO5*
		OR			
	b)	Compare FDMA, TDMA, and CDMA.	*11*	*K2*	*CO5*
28.	a) (i)	Write short notes on cyclic redundancy check (CRC).	*6*	*K2*	*CO4*
	(ii)	Explain spread spectrum principle. Compare DSSS and FHSS.	*5*	*K2*	*CO5*
		OR			
	b) (i)	Compare block coding and convolution coding.	*6*	*K2*	*CO4*
	(ii)	Explain m-sequence and its autocorrelation properties.	*5*	*K2*	*CO5*