Reg. No.															

Question Paper Code	13599

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

Third Semester

Computer Science and Engineering

(Common to Information Technology)

20ESEC301 - 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.	Any error in the local oscillator signal with respect to the carrier wave results in the distortion of _____. (a) Modulated signal (b) Carrier signal (c) demodulated signal (d) none of the mentioned	1	K1	CO1
2.	The output of product modulator in coherent detection for SSB wave is passed through _____. (a) HPF (b) BPF (c) LPF (d) none of the mentioned	1	K1	CO1
3.	The bandwidth of an FM signal is estimated using: (a) Carson's Rule (b) Nyquist Criterion (c) Shannon's Law (d) Fourier Transform	1	K2	CO2
4.	Which of the following is an advantage of FM over AM? (a) Noise Immunity (b) Requires less bandwidth (c) Easier to implement (d) None of the above	1	K2	CO2
5.	Time Division Multiplexing (TDM) allows multiple signals to share the same transmission medium by: (a) Allocating different frequency bands to each signal. (b) Assigning different time slots to each signal. (c) Modifying the amplitude of each signal. (d) Modifying the phase of each signal.	1	K1	CO3
6.	In line coding, the probability of error is _____. (a) increased (b) reduced (c) cannot say (d) None of the mentioned	1	K1	CO3
7.	BPSK is also called _____. (a) phase reversal keying (b) On-off keying (c) biphase modulation (d) phase reversal keying and biphase modulation	1	K1	CO4
8.	ISI causes (a) Distortion (b) Noise (c) Poor delivery of output (d) All of the mentioned	1	K1	CO4
9.	In convolution decoding, what is a convolutional code's constraint length? (a) Number of errors (b) Number of states (c) Number of bits (d) Number of layers	1	K1	CO5
10.	CDMA and TDMA differ by _____. (a) bandwidth (b) link (c) carrier (d) timesharing	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	Draw the spectra of DSB-SC & SSB-SC.	2	K1	CO1
12.	State the difference between SSB and VSB transmission systems.	2	K1	CO1
13.	Define frequency modulation.	2	K2	CO2
14.	Differentiate direct method and indirect method FM.	2	K2	CO2
15.	State sampling theorem.	2	K2	CO3

16.	Enumerate the applications of PCM.		*2*	*K2*	*CO3*
17.	Point out four applications of eye pattern.		*2*	*K1*	*CO4*
18.	Show the reason FSK and PSK signals are preferred over ASK signals.		*2*	*K1*	*CO4*
19.	An event has six possible outcomes with probabilities 1/2, 1/4, 1/8, 1/16, 1/32, 1/32. Find the entropy of the system.		*2*	*K2*	*CO5*
20.	Mention the properties of information.		*2*	*K1*	*CO5*
21.	What is the concept of frequency reuse?		*2*	*K1*	*CO6*
22.	State Kepler's third law.		*2*	*K2*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Derive an expression for AM (or) conventional AM? And derive the power distribution of AM.	*11*	*K2*	*CO1*
		OR			
	b)	With the help of neat diagram, explain the generation of VSB transmission? Draw VSB spectrum and explain the significance.	*11*	*K2*	*CO1*
24.	a)	Explain in detail about FM generation using indirect method.	*11*	*K2*	*CO2*
		OR			
	b)	Explain in detail the working of a super heterodyne receiver with a block diagram.	*11*	*K2*	*CO2*
25.	a)	Explain the generation of Delta Modulation with its waveform and Describe about ADM with its advantages and disadvantages.	*11*	*K2*	*CO3*
		OR			
	b)	Define Frequency Division Multiplexing (FDM). Explain how FDM is used in communication systems, its advantages and disadvantages, and the challenges of implementing FDM in high-bandwidth systems.	*11*	*K2*	*CO3*
26.	a)	Describe how Nyquist criterion eliminates interference in the absence of noise for distortion less baseband binary transmission.	*11*	*K2*	*CO4*
		OR			
	b)	Discuss the operation of a QPSK modulator with neat diagram. Draw its phasor and constellation diagram.	*11*	*K2*	*CO4*
27.	a)	A discrete memory less source has five symbols x1, x2, x3, x4, x5 with probabilities 0.4, 0.19, 0.16, 0.15, 0.15 respectively attached to every symbol. Construct Shannon-Fano coding for the source and calculate code efficiency η.	*11*	*K2*	*CO5*
		OR			
	b)	A rate 1/3 convolution encoder has generating vectors as g1= (1 0 0) , g2=(1 1 1) and g3 = (1 0 1) (i) Sketch the encoder configuration. (ii) Draw the code tree, state diagram and trellis diagram.	*11*	*K2*	*CO5*
28.	a)	Summarize the direct sequence spread spectrum techniques with neat block diagram.	*11*	*K2*	*CO6*
		OR			
	b)	Explain the GSM system architecture with neat diagram.	*11*	*K2*	*CO6*