Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Fifth Semester

Biomedical Engineering

CBM354- COMMUNICATION SYSTEMS

Regulations – 2021

Duration : 3 Hrs *Maximum: 100 Marks*

*PART – A(ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Define : Amplitude Modulation	RE	1	2
2.	Differentiate between phase modulation and frequency modulation.	UN	1	2
3.	Relate noise figure and noise temperature.	UN	2	2
4.	Define SNR. Whether SNR should be kept as minimum value or maximum value?	UN	2	2
5.	Calculate the amount of information if P_k= ¼.	AN	3	2
6.	What are the advantages of LZW coding?	RE	3	2
7.	Draw the block diagram of non coherent receiver for BPSK.	RE	4	2
8.	Infer the significance of geometric representation of signals.	UN	4	2
9.	State the fundamental properties of cyclic code.	RE	5	2
10.	Find the hamming distance between the code words (11101, 10010).	UN	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a		Construct a DSB-SC modulator used for Amplitude modulation explain in detail.	AP	1	13
			Or			
	b		Develop a FM Modulators and explain its working with clear block diagram.	AP	1	13
12.	a	i	Outline on noise sources and various types of noises in receiver model.	UN	2	7
		ii	If each stage has a gain of 10dB and noise figure of 10dB. Calculate the overall noise figure of a two-stage cascaded amplifier.	UN	2	6
			Or			
	b		With a neat block diagram, explain the working of super heterodyne receiver.	UN	2	13
13.	a	i	Five source messages are probable to appear as m_1=0.4, m_2=0.15, m_3=0.15, m_4=0.15, m_5=0.15 . Find coding efficiency using Shannons Fano coding.	AP	3	8
		ii	Outline the source coding theorem with necessary equations.	UN	3	5
			Or			
	b	i	Describe the discrete memory less channel.	UN	3	5
		ii	Symbols of the alphabet of discrete memory less source and their probabilities are given as, S={S0,S1,S2,S3,S4) P(S)={0.4,0.19,0.16,0.15,0.15}. Code the symbols using Huffman coding technique.	AP	3	8

14.	a	Analyze the impulse response of matched filter receiver with necessary equation.	AN	4	13
		Or			
	b	Compare and contrast BPSK and QPSK with respect to bit error rate.	AN	4	13
15.	a	Consider the (7,4) linear block code with generator matrix $\begin{bmatrix} 1000 & : 101 \\ 0100 & : 111 \\ 0010 & : 110 \\ 0001 & : 011 \end{bmatrix}$ (i) Find all the code vectors. (ii) Find parity check matrix. (iii) Minimum weight of this code.	AN	5	13
		Or			
	b	A convolutional code is described by the following generator sequences, $g^{(1)}$= {1,0,1}, $g^{(2)}$= {1,0,0}, $g^{(3)}$= {1,1,1}. (i) Draw the encoder to this code (ii) Draw the state diagram (iii) If the message sequence is 10110, find the code word.	AN	5	13

*PART – C (Marks 1*15 = 15)*

Q.No		*Questions*	*BLT*	*CO*	*Marks*
16.	a	Construct the generator and receiver of BFSK and Estimate the power spectral density and bit error rate of BFSK with necessary equations	EV	4	15
		Or			
	b	Consider a CRC(7,4) code with the divisor 1011, the message bits are 1001. Generate a code word and calculate syndrome for error free transmission and error at MSB bit position. Comment on the syndrome values.	EV	5	15