Course Code: 1940416 Roll No: MLRS-R19

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

II B.Tech II Sem Supply End Examination, July 2022

Analog and Digital Communications

(ECE)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

1.	a)	What is the net modulation index if three sine waves simultaneously amplitude modulate a HF carrier with modulation indices 0.3, 0.4 and 0.5?	2M	CO1	BL3
	b)	State the properties of Hilbert Transform. Find the Hilbert transform of a signal $m(t) = 2 \sin 2\pi f_m t$	2M	CO1	BL3
	c)	Report the underlying principle used to perform FM demodulation.	2M	CO2	BL1
	d)	An angle modulated wave is given by $S(t) = 10 \sin(2\pi 10^8 t + 5 \sin 2\pi 10^4 t)$. Calculate Maximum Frequency deviation & power dissipated in a 10Ω resistor.	2M	CO2	BL3
	e)	Discuss about image frequency rejection ratio of a receiver.	2M	CO3	BL3
	f)	Emphasize on the need for amplitude limiter in FM receivers?	2M	CO3	BL2
	g)	A sinusoidal signal is digitized using 4-bit PCM. Find the SNR_Q in dB.	2M	CO4	BL3
	h)	What is companding?	2M	CO4	BL2
	i)	Compare BPSK and QPSK signaling schemes.	2M	CO5	BL2
	j)	What is Inter Symbol Interference?	2M	CO5	BL1

PART- B

(10*5 Marks = 50 Marks)

2	a)	How an AM signal can be generated using a non-linear element? Explain with a diagram, mathematical analysis and waveforms.	5M	CO1	BL4
	b)	Discuss the generation, detection and application of VSB-SC signal.	5M	CO1	BL2
		OR			
3		Suggest a product modulator structure that can be used for modulation and demodulation of DSB-SC signal. Prove it with time domain analysis.	10M	CO1	BL3

4	a)	Describe Armstrong method of Indirect FM generation with a block diagram and working principle.	5M	CO2	BL2
	b)	Compare AM and FM modulation schemes.	5M	CO2	BL2
		OR			
5		How Balanced frequency discriminator performs demodulation of FM signal. Explain.	10M	CO2	BL4
6	a)	Explain the working of FM receiver with a block diagram.	5M	CO3	BL2
	b)	Explain the working of Low level AM transmitter with the help of a neat block diagram.	5M	CO3	BL4
		OR			
7		Draw the block diagram of Super heterodyne AM receiver. Explain the functionality of each block.	10M	CO3	BL4
8	a)	Compare PAM, PWM and PPM techniques with respect to power and noise immunity.	5M	CO4	BL2
	b)	Describe the working of DPCM system with diagrams.	5M	CO4	BL2
		OR			
9		Describe the generation and demodulation of PWM signal.	10M	CO4	BL2
10	a)	With a suitable block diagram, explain the principle and operation of BPSK scheme.	5M	CO5	BL4
	b)	Write a brief note on Matched filter receiver.	5M	CO5	BL2
		OR			
11		With a neat sketch, explain the working of FSK modulator and demodulator with necessary equations and waveforms.	10M	CO5	BL4

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