Code No: P18ECT10

HALL TICKET NUMBER

PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE

(AUTONOMOUS)

III B.TECH I SEMESTER END REGULAR EXAMINATIONS, DEC/JAN – 2022/23

DIGITAL COMMUNICATIONS

(ECE Branch)

Time: 3 hours Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answer all the questions in Part-A (5X2=10M)

Q.No.		Questions	Marks	CO	KL
1.	a)	What are the advantages of Delta modulation?	[2M]	1	1
	b)	List the various digital modulation schemes.	[2M]	2	1
	c)	What is the difference between coherent and non-coherent detection?	[2M]	3	1
	d)	State Shannon's theorem.	[2M]	4	2
	e)	What is the use of linear block codes?	[2M]	5	1

PART-B

Answer One Question from each UNIT (5X10=50M)

Q. No.		Questions	Marks	CO	KL
		UNIT-I			
2.	a)	Mention the sources of noise in a PCM system and derive the output signal to quantization noise ratio expression in PCM System.	[5M]	1	4
	b)	A signal whose amplitude varies from 0 to 10volts is band limited to 4KHz and transmitted through the channel using 5-bit PCM system. The sampling rate is 50% higher than the Nyquist rate. Calculate all parameters of PCM system.	[5M]	1	3
		OR			
3.	a)	With neat diagrams explain the adaptive delta modulation.	[5M]	1	3
	b)	Draw and explain the elements of digital communication system.	[5M]	1	2
		UNIT-II			
4.	a)	Explain the modulation and detection of BFSK with neat diagram.	[5M]	2	2
	b)	Discuss the differences between binary and M-ary signalling schemes.	[5M]	2	2
		OR			
5.	a)	With neat sketch explain the generation and detection of DPSK.	[5M]	2	2
	b)	Discuss the coherent BPSK with relevant equations.	[5M]	2	2
		UNIT-III			
6.	a)	With neat diagrams explain the non-coherent detection of FSK.	[5M]	3	2
	b)	Derive the error probability of BPSK system.	[5M]	3	4
		OR			
7.	a)	Derive the probability of error for BFSK system.	[5M]	3	4
	b)	Explain the base band signal receiver with neat sketch.	[5M]	3	2
		UNIT-IV			
8.		Explain the Huffman encoding and Shannon-Fano techniques with an example.	[10M]	4	2

		OR			
9.	a)	Prove that H(X,Y) = H(X)+ H(Y / X) = H(Y) + H(X / Y).	[5M]	4	4
	b)	An analog signal band limited to 10kHz is quantized in 8 levels of a PCM system with probabilities of 0.25, 0.2, 0.2, 0.1, 0.1, 0.05, 0.05 and 0.05, respectively. Find the entropy and the rate of information.	[5M]	4	4
		UNIT-V			
10.		Find a generator polynomial *g(x)* for a (7, 4) cyclic code. Determine the code vectors for the data vector: 1010.	[10M]	5	3
		OR			
11.	a)	Prove that a linear block code with a minimum distance d_{min} can correct up to (d_{min}-1)/2 errors in each code word, where (dmin-1)/2 denote the largest integer number greater than (d_{min} -1)/2.	[5M]	5	4
	b)	Explain the decoding using Viterbi algorithm with an example.	[5M]	5	2

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