R20 Regulation *Subject code: 3P5DC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Supplementary Examinations, July 2024

DIGITAL COMMUNICATIONS

(ECE)

Maximum Marks: 70 Date:24.07.2024 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

	Part-A	CO	Bloom Tx
All the following questions carry equal marks (10X2M=20 Marks)			
1	Write the need for non-uniform quantization in digital communication?	1	L1
2	Compare the performance of PCM and DM system.	1	L1
3	Write the advantages of coherent digital modulation schemes?	2	L1
4	Draw the block diagram of the PLL.	2	L1
5	Define Entropy	3	L1
6	Derive the Expression for the Information Rate.	3	L1
7	List out Properties of Cyclic Codes.	4	L1
8	Write the advantages of convolution codes.	4	L1
9	What is Frequency hopping spread spectrum?	5	L1
10	Explain the generation of PN sequence.	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
11	a) Derive the expression for the Quantization error. [5]	1	L2
	b) With a neat sketch describe DPCM concept. [5]	1	
	OR		
12	a) Distinguish between analog communication and digital communication. [5]	1	L2
	b) Derive the expression for overall SNR in a ADM system. [5]	1	
13	a) Draw the space representation of BPSK. And also draw its waveforms? [5]	2	L2
	b) Describe the BPSK modulation technique with the help of a neat diagram. [5]	2	
	OR		
14	a) Draw and explain the operating principle of ASK Modulator. [5]	2	L2
	b) Explain the working of non-coherent FSK detector. [5]	2	
15	a) Explain Huffman coding with an example. [5]	3	L2
	b) Explain crosstalk concept. [5]	3	

	OR		
16	a) Apply Shannon-Fano coding procedure of M=2 and M=3 [x]=[x1, x2, x3, x4, x5, x6, x7, x8] with probability. [P]=[1/4, 1/8, 1/16, 1/16, 1/4, 1/16, 1/8 ,1/16]. [5]	3	L2
	b) Derive the bit error probability of a coherent ASK signaling scheme. [5]	3	
17	a) Decode convolution process using Viterbi algorithm. [5]	4	L2
	b) What are the characteristics of PN sequences? Explain. [5]	4	
	OR		
18	a) Design the encoder for the (7, 4) cyclic code generated by G(p)=p3 +p2 +1 and also verify the operation for any message vector. [5]	4	L2
	b) What are code tree, code trellis and state diagrams for convolution encoders? [5]	4	
19	a) What are the characteristics of PN sequences? Explain. [5]	5	L2
	b) Explain the advantages and applications of spread spectrum modulation. [5]	5	
	OR		
20	a) Describe with a neat sketch the direct sequence Spread spectrum technique. [5]	5	L2
	b) Describe the concept of Ranging using DSSS. [5]	5	