CODE No.: 16BT50401 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

III B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

DIGITAL COMMUNICTIONS

[Electronics and Communication Engineering]

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

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1	a)	Sketch the electrical representation of binary data 101000111 using different formats.	CO1	7 Marks
	b)	Discuss the advantages of DM over PCM.	CO2	7 Marks
		(OR)		
2	a)	What is the necessity of non-uniform quantization and explain companding.	CO1	7 Marks
	b)	If mp = 20V and 256 quantizing levels are employed, what is the voltage between levels when there is no compression? For $\mu = 255$, what is the smallest and what is the largest effective separation between levels.	CO2	7 Marks

UNIT-II

3	a)	Analyze the effect of thermal noise in PCM.	CO2	7 Marks
	b)	Derive the expression for Signal to Quantization noise ratio in Delta modulation.	CO2	7 Marks
		(OR)		
4		Justify that the output SNR in a PCM system is superior to that of a DM system.	CO3	14 Marks

UNIT-III

5	a)	Compare probability of error of different modulation techniques.	CO2	7 Marks
	b)	Implement a digital system for generation and reception of BFSK.	CO6	7 Marks
		(OR)		
6	a)	Explain the generation and reception of DPSK signal with example.	CO6	7 Marks
	b)	Explain the principle of QPSK system. Compare binary PSK and QPSK schemes.	CO2	7 Marks

UNIT-IV

7	a)	Define the following terms: i) Channel Capacity. ii) Rate of information.	CO1	4 Marks
	b)	Consider five symbols given by the probabilities 1/2, 1/4, 1/8, 1/16, 1/16. (i) Calculate Entropy (ii) Use Huffman algorithm to develop an efficient code and calculate the average number of bits/symbol. Compare with Entropy.	CO5	10 Marks
		(OR)		
8	a)	Differentiate the terms: i) Data and Information. ii) Define entropy.	CO5	8 Marks
	b)	Find the Channel capacity of Binary symmetric channel.	CO5	6 Marks

UNIT-V

9	a)	Compare linear block codes and cyclic codes with an example.	CO4	6 Marks
	b)	What is the use of syndrome? Draw the (n-k) syndrome calculation circuit for (n, k) cyclic code and explain its operation.	CO3	8 Marks

(OR)

10	a)	The generation matrix for a (6,3) clock code is given below. Construct all code vectors of this code. $G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 0 & 1 \end{bmatrix}$.	CO3	8 Marks
	b)	What are cyclic codes? List their advantages and disadvantages.	CO4	6 Marks