



R18Regulation

Subject code: 2P5DD

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech V Semester Regular Examinations, February 2021
DIGITAL COMMUNICATIONS
(Electronics and Communication Engineering)

Maximum Marks: 70

Date: 24.02.2021 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

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 State Sampling Theorem
- 2 Differentiate Uniform Quantization and Non -Uniform Quantization
- 3 What is the bandwidth of ASK?
- 4 What is Frequency Shift Keying??
- 5 Define Entropy.
- 6 List any two properties of Information
- 7 Write about Syndrome Properties.
- 8 Define code rate for (n, k) linear block code.
- 9 What is frequency hopping Spread Spectrum?
- 10 What is the need for Spread Spectrum?

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11 Explain the block diagram of Digital Communication systems in detail. (10M)
- OR**
- 12 Derive an expression for signal to quantization noise power ratio for Delta Modulation. (10M)
 - 13 Explain the modulation and demodulation of ASK technique with neat sketch.(10M)
- OR**
- 14 Explain the modulation and demodulation of FSK technique with neat sketch.(10M)
 - 15 Apply Shannon fano coding procedure for a discrete memory less source 'X' with six symbols X1, X2, X3, X4, X5, X6 find a compact code for every symbol if the probability distribution is as follows: X1 = 0.3, X2=0.25, X3= 0.2, X4= 0.12, X5 = 0.08, X6=0.05. Calculate entropy of the source, average length of the code, efficiency and redundancy of the code. (10M)

OR

- 16 A discrete memoryless source has 6 symbols s_1, s_2, s_3, s_4, s_5 & s_6 with probabilities 0.4, 0.1, 0.2, 0.1, 0.1 and 0.1 respectively. Construct a Huffman Code and Calculate its η . (10M)

- 17 The generator matrix for a (6, 3) block code is given by (10M)

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

- a) Find the code vectors.
- b) Find the parity check matrix.
- c) Find the error syndrome.

OR

- 18 Consider the (6, 3) linear block code with

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

- i) Write the Parity equations
- ii) If the received code word is 010111, determine syndrome and location of the error. (10M)

- 19 Explain in detail about Pseudo Noise Sequences (10M)

OR

- 20 Explain in detail about Direct Sequence Spread Spectrum with neat diagram. (10M)