



Regulation R18

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code: 2P5DD

B.Tech V Semester Supplementary Examinations, January 2023
DIGITAL COMMUNICATIONS

(ECE)

Maximum Marks: 70

18-01-2023

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 What is Quantization error?
- 2 What are the drawbacks of delta modulation?
- 3 Sketch the PSK waveforms for a given input data "110100"
- 4 What is Frequency Shift Keying?
- 5 Define entropy and give the expression for it.
- 6 State the channel coding theorem.
- 7 Write the advantages of convolution codes.
- 8 Define Minimum Distance.
- 9 What is spread spectrum modulation?
- 10 Write the principle of CDMA?

Part-B

Answer All the following questions.

(5 X 10M=50Marks)

- 11 State and prove the sampling theorem in time domain 10

OR

- 12 With the help a neat diagram, explain the transmitter and receiver of DM? 10

- 13 Describe the modulation and non-coherent detection of BFSK with the help of a neat diagram 10

OR

- 14 Explain the Receiver of 8-PSK technique with neat sketch? 10

- 15 Prove that the capacity of a white band limited Gaussian channel is $B \log_2(1+S/N)$ bits/sec 10

† OR

- 16 A source is producing sequence of independent symbols A, B, C, D and E with the following probabilities. 10

X	A	B	C	D	E
P(X)	1/2	1/6	1/12	1/6	1/12

- (i) Derive an unambiguous binary code (Shannon fano code) for these symbols.
- (ii) Compute the coding efficiency of code.

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

10

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

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

OR

18 Consider a (7,4) linear block code whose generator matrix is given $G =$

10

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

$$M = [1 \ 1 \ 0 \ 0]$$

- a) Find all the code vectors of the code.
 - b) Find the parity check matrix of this code.
 - c) Find minimum weight of this code.
- 19 a) Define spread spectrum modulation. 5
- b) Explain the advantages and applications of spread spectrum modulation 5

OR

20 Explain about PN [Pseudo-Noise] sequence generation?

10