



Regulation R17

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

Subject code: 1P5DC

B.Tech III Year I Semester Supplementary Examinations, December 2021
DIGITAL COMMUNICATIONS

(Electronics and Communication Engineering)

Maximum Marks: 70

Date: 03.01.2022 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 are the advantages of digital communication systems?
- 2 What is meant by Quantization?
- 3 Draw the ASK and FSK waveforms for 011011.
- 4 Find the band width required for frequency shift keying and draw its spectrum.
- 5 State the properties of Entropy.
- 6 Define information.
- 7 List the features of binary cyclic codes.
- 8 What is a Hamming distance?
- 9 Explain the use of Use of spread spectrum?
- 10 What are the advantages of Code division multiple access?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Prove that the signal to quantization noise power ratio in pulse code modulation system is $(1.8+6n)$ dB. (10M)
- OR
- 12 Explain with neat block diagram adaptive delta modulator transmitter and receiver? (10M)
 - 13 Draw the block diagram of DPSK modulator and explain how synchronization problem is avoided for its detection. (10M)
- OR
- 14 Explain the modulation of FSK and demodulation of FSK using coherent detection. (10M)
 - 15 Prove that $H(Y/X) \leq H(Y)$ with equality if and only if X and Y are independent. (10M)
- OR
- 16 Illustrate Shannon-fano coding technique by taking an example. (10M)
 - 17 Explain about matrix description of linear block codes. (10M)

OR

18 Consider a (7,4) linear code whose generator matrix is

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

- (a) Find all the code vectors of this code.
- (b) Find the parity check matrix for this code.
- (c) Find the minimum weight of this code.
- (d) Show the error correction capability of this code. (10M)

19 With the help of a neat block diagram, explain the working of a DS spread spectrum-based CDMA system. (10M)

OR

20 What are the two basic types of spread-spectrum systems? Explain the basic principle of each of them. (10M)