



R20 Regulation

Subject code:3P5DC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Regular/Supplementary Examinations, February 2024
DIGITAL COMMUNICATIONS
(ECE)

Maximum Marks: 70

Date:20.02.2024 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	What are the drawbacks of delta modulation?	1	1
2	What is slope overload distortion? Explain.	1	1
3	Write about the bandwidth requirements of BPSK system.	2	2
4	Define QPSK.	2	1
5	List out the Advantages of Pass band Transmission over Baseband transmission.	3	1
6	Define conditional entropy.	3	1
7	Explain in one sentence about (i) Block Size (ii) Linear block codes.	4	2
8	Mention various types of errors caused by noise in communication channel	4	2
9	Briefly explain about "Spread spectrum."	5	2
10	Define DSSS.	5	1
Part-B			
Answer All the following questions. (5X10M=50Marks)			
11	a) With neat block diagram, Explain the process of Sampling and Quantization in digital communication. [5]	1	2
	b) What is Hartley Shannon law? And explain sampling theorem. [5]	1	2
OR			
12	a) Explain the tradeoff between bandwidth and signal to noise ratio. [5]	1	2
	b) A voice frequency signal band limited to 3kHz is transmitted with the use of the DM system. The pulse repetition frequency is 30,000 pulses per second, and the step size is 40mV. Determine the permissible speech signal amplitude to avoid slope overload. [5]	1	3
13	a) With neat diagrams and equations, explain about PSK system. [5]	2	2
	b) Describe the BPSK modulation technique with the help of a neat diagram. [5]	2	2
OR			
14	a) Explain the DPSK modulation technique with the help of a neat sketch. [5]	2	2

	b) Explain frequency shift keying. Describe coherent detection of FSK signals. What should be the relationship between bit-rate and frequency-shift for a better performance? [5]	2	2
15	a) What is the need of pulse shaping for optimum transmission in baseband transmission? Explain. [5]	3	2
	b) Obtain the probability of bit error for coherently detected BPSK. [5]	3	3
	OR		
16	Compare code efficiency of Shannon Fano coding and Huffman coding when five source messages have probabilities $m_1=0.4$, $m_2=0.15$, $m_3=0.15$, $m_4=0.15$, $m_5=0.15$. [10]	3	3
17	Decode convolution process using Viterbi algorithm. [10]	4	3
	OR		
18	a) Describe the algebraic structure of cyclic codes. [5]	4	2
	b) Derive the steps involved in generation of linear block codes. Define and explain the properties of syndrome. [5]	4	3
19	a) Give a brief history about direct sequence spread spectrum. [5]	5	2
	b) Derive the necessity of DSSS techniques. Draw the transmitter and receiver block diagram and explain. [5]	5	2
	OR		
20	a) Discuss the frequency hopping spread spectrum technique in detail. [5]	5	3
	b) What is meant by Synchronization? Why we require synchronization in spread spectrum? Explain in detail. [5]	5	2