

ANURAG Engineering College

(An Autonomous Institution)

III B.Tech I Semester Regular/Supplementary Examinations, Dec-2023/Jan-2024

DIGITAL COMMUNICATIONS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours**Max.Marks:75****Section – A (Short Answer type questions)****(25 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. Define quantization error.	CO1	L1	2M
2. What is the influence of step size in delta modulation? Explain	CO1	L2	3M
3. Draw the typical BFSK wave form.	CO2	L1	2M
4. Define probability of error.	CO2	L2	3M
5. Define information rate.	CO3	L1	2M
6. Write the properties of mutual information.	CO3	L2	3M
7. Explain the use of syndrome.	CO4	L1	2M
8. What is the need for error detection?	CO4	L2	3M
9. What are the advantages of spread spectrum communication?	CO5	L1	2M
10. Write the characteristics of PN Sequence.	CO5	L2	3M

Section B (Essay Questions)**Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) Derive the signal to quantization Noise ratio when a sinusoidal signal is modulated using PCM and DM.	CO1	L3	10M
OR			
B) Compare the Pulse Code Modulation and Delta Modulation techniques.	CO1	L2	10M
12. A) What is an optimum filter? Derive the expression for the transfer function of an optimum filter?	CO2	L3	10M
OR			
B) Explain the generation of QPSK signals with a neat block diagram. Also draw the phasor diagram of QPSK.	CO2	L2	10M
13. A) One of five possible messages Q1 to Q5 having probabilities 1/2, 1/4, 1/8, 1/16, 1/16, respectively, is transmitted. Calculate the average information and efficiency using Hauffman Coding.	CO3	L3	10M
OR			
B) Explain Shannon's theorem for channel capacity of analog channels.	CO3	L2	10M
14. A) Explain matrix description of linear block codes.	CO4	L2	10M
OR			
B) Analyze the code tree, state diagram and trellis diagram for a 1/2 rate encoder with generator sequences $g_1 = (1,1,1)$, $g_2 = (0,1,0)$.	CO4	L3	10M
15. A) Explain the principle of Direct Sequence Spread Spectrum.	CO5	L2	10M
OR			
B) With a help of neat block diagram, explain the working of DS spread spectrum-based CDMA system.	CO5	L3	10M