

Seat No. **OCT-NOV 2025 WINTER EXAMINATION****1154 B.Tech. CBCS****Sub. Name: Digital Communication****Sub. Code: 79184/79472****Day and Date: Friday ,05-12-2025****Total Marks: 70****Time: 10:30 AM To 01:00 PM**

- Instructions:**
1. All questions are compulsory
 2. Assume suitable data wherever necessary and mention it boldly
 3. Draw neat labelled diagrams wherever necessary
 4. Figures to the right indicate full marks

Q1) Q.1 Attempt following Multiple choice questions.....[14*1=14 [14 marks]

1. Which gives the measure of randomness of the random variable? [1]
A. Mean B. Variance C. Standard variance D. PDF
2. Mapping of Outcomes to real No. is called as [1]
A. Random variable B. Gamma variable C. Algebraic variable D. None of the above
3. Gaussian PDF is [1]
A. Square Shaped Structure B. Circular Shaped Structure
C. Cylindrical Shaped Structure D. Bell Shaped Structure
4. The sub-processes involved in the PCM modulation in sequential order are: [1]
A. Sampling, quantizing, encoding B. Quantizing, encoding, sampling
C. Quantizing, sampling, encoding D. None of the above
5. Out of the following mentioned techniques, modulation technique requires minimum bandwidth [1]
A. Delta modulation B. PCM C. DPCM D. PAM
6. is the digital modulation technique in which the step size is varied according to the variation in the slope of the input [1]
A. DM B. PCM C. ADM D. PAM
7. The relation between entropy and mutual information is [1]
A. $I(X;Y) = H(X) - H(X/Y)$ B. $I(X;Y) = H(X/Y) - H(Y/X)$
C. $I(X;Y) = H(X) - H(Y)$ D. $I(X;Y) = H(Y) - H(X)$
8. In On-Off keying, the carrier signal is transmitted with signal value '1' and '0' indicates [1]
A. No carrier B. Half the carrier amplitude

- C. Amplitude of modulating signal D. None of the above
9. Spread spectrum signals are used for [1]
 A. Ranging B. Determination of position
 C. Ranging & Determination of position D. None of the mentioned
10. As the eye opens, ISI _____ [1]
 A. Increases B. Decreases C. Remains the same D. None of the mentioned
11. The technique that may be used to reduce the side band power is [1]
 A. MSK B. BPSK C. Gaussian minimum shift keying D. BFSK
12. Granular noise occurs when [1]
 A. Step size is too small B. Step size is too large
 C. There is interference from the adjacent channel D. Bandwidth is too large
13. Eye Diagram will be corrupted by [1]
 A. Noise B. Interference C. Both A and B D. None of the above
14. ASK is sometimes referred as [1]
 A. ON-OFF Keying ON-ON Keying C. OFF-OFF Keying D. None of the above
- Q2) Solve any two.....[2 × 7 = 14] [14]**
- A. In class of 100 students ,40 students had taken maths,30 students taken biology then what is probability of students who had taken both subjects . [7]
- B. Consider sources s_1, s_2, s_3 having probability of the messages $P_1=1/4, P_2=1/4, P_3=1/2$ find entropy of the system [7]
- C. Three coins are tossed then calculate probability – [7]
 1.of getting exactly one tail &
 2.of getting at least 2 tails
- Q3) Solve any two.....[2 × 7 = 14] [14]**
- A. Derive Baye's theorem. [7]
- B. Explain any two properties of information with its proof. [7]
- C. Apply Shannon-fano coding for following messages S_1 to S_6 .where probability $P=[0.25, 0.30, 0.12, 0,15, 0.08, 0.10]$. Find efficiency of the code and also calculate redundancy. [7]
- Q4) Solve any two.....[2 × 7 = 14] [14]**

- A. Explain Unipolar RZ with its advantages and disadvantages [7]
- B. Discuss QPSK in detail. [7]
- C. Draw the Eye pattern and indicate how ISI is measured from it [7]
- Q5) Solve any two.....[2 × 7 = 14] [14]**
- A. Explain Spread Spectrum techniques: DSSS [7]
- B. Discuss the principle of operation of ASK transmitter [7]
- C. Explain inter symbol interference (ISI) [7]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

- 1] (1154) B.Tech. CBCS (79184) Digital Communication Part 2 SEM 4
- 2] (101) Bachelor of Engineering (79472) Digital Communication Part 2 SEM 4