Roll No: .....

National Institute of Technology, Delhi

Name of the Examination: B. Tech: Autumn 2023 Semester

Branch : ECE **Semester** : I

Title of the Course : Digital Communication **Course Code** : ECB 303

Time: 1.5 Hours **Maximum Marks: 25**

Note:

- **Questions are printed on BOTH sides. Answers should be CLEAR AND TO THE POINT. Attempt all Questions. Assume the necessary data, if any.**

Course Outcomes		Cognitive Levels
CO 1:	To describe the basic building blocks of a digital communication system and understand the concept of sampling and bandwidth. Revision of Fourier series and transform concepts.	Remembering (Level 1) Understanding (Level II)
CO 2:	To compare and contrast various line coding techniques for efficient digital data transmission and to analyze all waveform coding schemes for digital communication systems.	Analyzing (Level IV)
CO 3:	To design the digital radio receiver structure and analyze the performance of receivers in terms of probability of error in presence of noise.	Applying (Level III) Creating (Level VI)
CO 4:	To explain and discuss all binary and multilevel digital modulation techniques and evaluate the performance of these techniques in terms of bit error rate and spectral efficiency.	Understanding (Level II) Evaluating (Level V)

Course Outcomes (CO's)	CO1	CO2	CO4
Questions No.	Q1, Q2	Q3, Q4	Q5

1.	Explain the need of Line Coding formats. Draw the following data formats for the bit stream 1 1 0 0 1 1 0 0 0 0 0 0 1 (i) HDBN (ii) Bipolar NRZ (iii) Split Phase Manchester	**(5)**
2.	Obtain the Fourier Transform of a Rectangular Function.	**(5)**
3.	Explain the Need of Quantization Process. Draw and explain the transmitter, receiver structure of DM system with neat block diagram along with its advantages and disadvantages.	**(5)**
4.	Differentiate between Bit Rate and Baud Rate. Draw and explain the	**(5)**