

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2026**

DIGITAL COMMUNICATION

[Maximum Marks: 75]

[Time: 3 Hours]

PART-A

I. Answer ‘all’ the following questions in one word or one sentence. Each question carries ‘one’ mark.

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1.	A signal of frequency 4Kz has to be sampled at-----for proper reconstruction.	M1.02	U
2.	Define quantisation error.	M1.02	R
3.	The number of bits per symbol in QPSK is-----.	M2.01	U
4.	Define half duplex communication.	M2.03	R
5.	Write the names of two error correction codes.	M3.04	R
6.	The number of bits required for a 16 - level PCM is-----.	M1.03	U
7.	State the purpose of source coding.	M3.03	R
8.	Define PN sequence.	M4.01	R
9.	Write any two advantages of CDMA.	M4.02	R

PART-B

II. Answer any ‘eight’ questions from the following. Each question carries ‘three’ marks.

(8 x 3 = 24 Marks)

		Module Outcome	Cognitive level
1.	Explain the different sampling techniques.	M1.01	U
2.	Compare delta modulation and Adaptive Delta Modulation.	M1.04	R
3.	List advantages and draw backs of PCM.	M1.03	R
4.	Explain FDM.	M2.02	U
5.	Draw ASK and BFSK waveform for an input sequence 101101.	M2.01	U
6.	Differentiate between synchronous and asynchronous transmission.	M2.03	U
7.	State and explain channel capacity theorem.	M3.02	R
8.	Four symbols are described by the probabilities: $P(x_1) = \frac{1}{2}, P(x_2) = \frac{1}{4}, P(x_3) = \frac{1}{8}, P(x_4) = \frac{1}{8}$ Construct a Shannon Fano code.	M3.03	U
9.	List a few applications of spread spectrum communication.	M4.01	R
10.	Compare BPSK and DPSK.	M2.01	U

PART-C

Answer 'all' questions from the following. Each question carries 'seven' marks.

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III.	Explain PCM with the help of a block diagram. OR	M1.02	U
IV.	Explain Adaptive Delta Modulation with block diagram.	M1.04	U
V.	Explain QPSK with the help of required block diagram and waveforms. OR	M2.01	U
VI.	Explain a TDM system with the help of neat sketches. List the advantages and disadvantages of TDM.	M2.02	U
VII.	A system has a bandwidth of 4kHz and a SNR of 28dB at the input to the receiver. Calculate the information carrying capacity of the system. Also, find the channel bandwidth for doubling the information carrying capacity if SNR is the same. OR	M3.02	A
VIII.	Define entropy. The probabilities of five possible outcomes of an experiment are given as: $P(x_1) = \frac{1}{2}, P(x_2) = \frac{1}{4}, P(x_3) = \frac{1}{8}, P(x_4) = P(x_5) = \frac{1}{16}$ Find information content per each symbol and entropy.	M3.01	A
IX.	The generator matrix for a (6, 3) block code is given below. Find all the code vectors of this code. $\begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$ OR	M3.04	A
X.	Explain a convolutional Encoder with the help of a block diagram. List a few applications of convolutional encoder.	M3.04	R
XI.	Explain CDMA with the help of block diagram and required sketches. List a few applications. OR	M4.02	U
XII.	Compare Direct sequence spread spectrum and Frequency Hop Spread spectrum.	M4.01	U
XIII.	Explain the working principle of OFDM. Also, draw the OFDM spectrum. OR	M4.03	U
XIV.	Compare TDMA and FDMA.	M4.02	U
