(Affiliated to University of Mumbai)	***End Semester Examination (R-24/R-25) SH 2026 Answer Key with marking scheme***
Branch: EXTC	Course: DIGITAL COMMUNICATION
Year/ Semester: TE/V	Course code: ETC 501
Time: 03 hours	Marks: 80

		Marks
Q. 1	All questions are compulsory.	
A.	Baseband transmission (2M), Passband transmission(2M), Examples (1M)	5
B.	Entropy Equation (1M), H = 1.922 bits/symbol (2M), Information rate equation (1M), R = 1922 bps (1M)	5
C.	Encoder block diagram (1M), Decoder Block diagram (1M), Explanation (2M), Waveform (1M)	5
D.	Mux diagram of both (1M), Frame structures of both (2M), Output rate calculation of both (2M)	5
E.	Nyquist criterion (3M), Nyquist bandwidth (1M), Practical Bandwidth (1M)	5
F.	Baseband SS encoder and decoder with explanation (3M), capabilities (1M), Applications (1M)	5
Q.2A	SH Theorem statement (2M), Description of each variable (2M), SNR equation (1M), SNR = 1023 (3M), SNR in dB (2M)	10
	OR	
Q.2B.	a = 00, b = 01, c = 10, d = 11 Huffman codes (3M) a = 00, b = 01, c = 10, d = 11 S-F codes (3M) H = 1.9855 bits/symbol (2M) L = 2 bits/symbol (1M) Code efficiency = 99.275% (1M)	10
Q.3A	PSD of polar (2M), spectrum (2M), Bandwidth (1M), PSD of unipolar (2M), spectrum (2M), Bandwidth (1M),	10
	OR	
Q.3B	ISI (3M), Nyquist Criterion (3M), Nyquist Transfer function (2M), Nyquist Bandwidth (2M)	10
Q.4A	Transmitter with explanation (2M), Receiver with explanation (2M), Power spectrum (2M), Bandwidth (1M), geometrical representation (1M), Euclidean Distance (1M), Error probability (1M)	10
	OR	
Q.4B	Transmitter with explanation (2M), Receiver with explanation (2M), Power spectrum (2M), Bandwidth (1M), geometrical representation (1M), Euclidean Distance (1M), Error probability (1M)	10
Q.5A	Transmitter with explanation (2M), Receiver with explanation (2M), Power spectrum (2M), Bandwidth (1M), geometrical representation (1M), Euclidean Distance (1M), Error probability (1M)	10
	OR	
Q.5B	Transmitter with explanation (2M), Receiver with explanation (2M), Power spectrum (2M), Bandwidth (1M), geometrical representation (1M), Euclidean Distance (1M), Error probability (1M)	10

Q.6A	Output sequence = 1010 1001 0001 (6M) Properties (2M). Applications (2M)	10
	OR	
Q.6B	Encoder (2M), Decoder (2M), Encoder explanation (3M), Decoder explanation (3M)	10
	*********** All the Best***********	