CLASS TEST I Feb 2026

ECPC212: Information Theory and Coding

Marks 15

Duration 50 min

Q.1 With the help of necessary equations, derivations and Figures explain the Water Filling algorithm for Power distribution over the colored noise channel. 08

Q.2 A discrete source transmits messages $[X] = [x_1, x_2, x_3]$ with probabilities [1/2, ¼, ¼]. The channel matrix is given by 07

$$\begin{bmatrix} 0.6 & 0.2 & 0.2 \\ 0.2 & 0.6 & 0.2 \\ 0.2 & 0.2 & 0.6 \end{bmatrix}$$

The source outputs are $[Y] = [y_1, y_2, y_3]$. Determine (a)H(X) (b) H(Y) (c) H(XY) (d) I(XY) and (e) Channel capacity.
