



NATIONAL INSTITUTE OF TECH.
B.TECH., 4th SEMESTER, MID-SEMESTER-I
SUBJECT: INFORMATION THEORY
COURSE CODE: ECPC-21

Maximum Marks: 20

Answer all the following questions

1. State the following: Source coding theorem, channel coding theorem, and channel capacity theorem.

2. A discrete memoryless source has an alphabet of five symbols with their probabilities for its output, as given below

Symbol	s_0	s_1	s_2	s_3	s_4
Probability	0.55	0.15	0.15	0.10	0.05

Compute the Huffman and Shannon-Fano codes for this source. Also compare the coding efficiency.

3. Explain the properties of mutual information.

4. What is the joint entropy $H(X, Y)$, and what would it be if the random variables X and Y were independent?