

PES INSTITUTE OF TECHNOLOGY BANGALORE SOUTH
CAMPUS

QUESTION BANK

INFORMATION THEORY AND CODING (17EC54)

Module 1

1. Derive an expression information of symbols in long dependent sequence.
2. Define Self Information, Entropy and Information rate.
3. Mention different properties of entropy and prove external property.
4. Explain the block diagram of information system.
5. Define entropy. State various properties of the entropy.
6. Derive an expression for the entropy of the nth extension of a zero memory source.
7. State the properties of entropy.

Module 2

1. Derive Source Coding Theorem.
2. Write a short note on Lempel Ziv Algorithm
3. With an illustrative example, explain arithmetic coding technique?
4. With an example, explain prefix codes?
5. State Kraft-McMillan Inequality property?

Module 3

1. Define Mutual Information and List the properties of Mutual Information.
2. Derive an expression for the channel capacity of a binary erasure channel.
3. Write a note on differential entropy.
4. Define i) Input entropy ii) Output entropy iii) Equivocation iv) Joint Entropy v) Mutual Information with the aid of respective equations.

5. Prove that the mutual information is always a non-negative quantity.
6. State the properties of Joint Probability Matrix.
7. Derive an expression for the channel capacity for a binary symmetric channel.

Module 4

1. Distinguish between block codes and Convolution codes.

Module 5

1. Write a note on BCH codes?
2. Describe the Viterbi decoding algorithm?
3. Explain why (23,12) Golay code is called as perfect code?