

Exam.Code:0969
Sub. Code: 7656

2031
M.E. (Electronics and Communication Engineering)
First Semester
ECE-1105: Information Theory and Coding
(For UIET)

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Attempt the following:-
- Define Joint Entropy
 - Define coding efficiency.
 - In coding gain & bandwidth of TCM, if the signal energy is kept constant, the _____ of constellation reduces the noise margin and results into the _____ of performance.
 - What is the channel capacity of a binary symmetric channel?
 - Name one asymmetric and symmetric algorithms in cryptography. (5x2)

UNIT - I

- II. a) What is entropy? Why they are called as measure of information?
b) A discrete source emits one of five symbols once every milliseconds with probabilities $1/2, 1/4, 1/8, 1/16$ and $1/32$. Find the source entropy and information rate. (2x5)
- III. a) Explain source coding theorem.
b) Explain Automatic Repeat Request error correcting code. (2x5)
- IV. a) Describe the process to achieve the perfect communication through a noisy channel with the help of a block diagram.
b) Explain the capacity of a noiseless discrete channel. (2x5)

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UNIT - II

- V. a) Describe Shannon rate limit and its effect on design of communication system.
b) Explain the power spectral density for a noisy channel. (2x5)
- VI. a) Explain Viterbi decoding algorithm.
b) Describe Soft decision Decoding and how it is different from Hard decision decoding? (2x5)
- VII. a) Describe Trellis coded modulation with diagram.
b) Explain Asymmetric algorithm and compare it with symmetric algorithm. (2x5)

x-x-x