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Total No. of Questions : 08] [Total No. of Pages : 02

M.Tech.

INFORMATION THEORY & CODING

SUBJECT CODE : EC - 509

Paper ID : [E0568]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours **Maximum Marks : 100**

Instruction to Candidates:

1) Attempt any **Five** questions.
2) **All** questions carry equal marks.

Q1) (a) Draw the block diagram of digital communication system and explain the functions of source encoder/decoder and channel encoder/decoder.

(b) Give the interpretation of eye pattern.

Q2) (a) State & explain Shanon-fano theorem.

(b) What are the factors responsible for increasing the channel capacity?

Q3) Given the following ensemble S={Sl,S2,S3,S4,S5,S6,S7}

P(S)={ 1/3, 1/3, 1/9, 1/9, 1/27,1/27, 1/27}

(a) Find H(S) & $H(S_3)$.

(b) Find a compact Huffman code when X=[0,l] & X=[0,1,2]. Find the average length & efficiency for both the above codes.

Q4) (a) State and explain the sampling theorem for bandpass signals.

(b) What is interpolation? What are the various interpolation methods?

Q5) (a) What are the major sources of quantizing errors in DM? How are they reduced?

(b) Describe the concept of MSK. Compare its performance with QPSK.

Q6) (a) Explain binary cyclic codes with practical examples. What is burst error correction?

(b) What is adaptive equalization? How is it achieved?

Q7) (a) Design a Linear block code with a minimum distance of 3 and a message block size of 8 bits. Give the [G] and [H] matrices

(b) Define forward error correction (FEC) scheme. Give example. Compare it to an ARQ procedure.

Q8) Write notes on the following :

(a) Error probability in PCM.

(b) Convolution codes.