SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | Total number of pages:[2]

B.Tech. || ECE || 5th Sem

Information Theory & Coding

Subject Code: BTEC-513A

Paper ID:

Time allowed: 3 Hrs **Max Marks: 60**

Important Instructions:

- **All questions are compulsory**

PART A (10x 2marks)

Q. 1. Short-Answer Questions:

(a) What is Pulse Code Modulation?
(b) What do you mean by Channel Capacity?
(c) Define Code Efficiency.
(d) What are the advantages of LRC over VRC?
(e) State different types of Channels.
(f) Define Information content of a symbol.
(g) Given a DMS X with two symbols x_1 and x_2 and $P(x_1) = 0.9$, $P(x_2) = 0.1$. Symbols x_1 and x_2 are encoded with codes 0 and 1 respectively. Find the efficiency and redundancy of this code.
(h) What are advantages of Convolutional Codes over Block Codes?
(i) Define Entropy.
(j) What do you mean by Granular noise?

PART B (5×8marks)

Q. 2. Explain Automatic Repeat Request for Go back N Strategy. CO4

OR

Explain the Sender Side Algorithm for Automatic Repeat Request. CO4

Q. 3. Write note on Convolutional Codes. What are advantages and disadvantages of Convolutional codes over Block Codes? CO3

OR

What is Hamming Code? Generate the hamming codeword for ASCII character 'u' = 1010101. Assume even parity for the hamming code. CO3

Q. 4. What do you mean by Delta Modulation? Explain its drawbacks. CO2

OR

What is Pulse code Modulation? Explain DPCM in detail. CO2

Q. 5. A DMS has eight symbols A, B, C, D, E, F, G & H with probability of occurrence as P(A)= P(B) = 0.25, P(C) = P(D) = 0.14, P(E) = P(F) = P(G) = P(H) =0.055 respectively. Construct Huffman code for X. CO1

OR

State and Prove Channel Capacity Theorm. CO1

Q. 6. A voice grade channel of the telephone network has a bandwidth of 3.4 KHz. Calculate the Information capacity of the telephone channel for a signal-to-noise-ratio of 30 dB. CO1

OR

Find Shannon-Fano code for five messages given by probabilities 1/2, 1/4, 1/8, 1/16, 1/16. Calculate the average number of bits/message. CO1