

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 Part.

x-x-x

Q1(i) What is the significance of Error controlling codes?

(ii) A source generates information with probabilities of $p_1=0.1, p_2=0.2, p_3=0.3, p_4=0.4$. calculate the entropy of the system.

(iii) Let A and B be two events. If $P(A)=0.2, P(B)=0.4, P(A \cup B)=0.6$, then evaluate $P(A|B)$.

(iv) How is analog modulation different from digital modulation?

(v) Draw waveform for PAM and PWM signal.

[5x2=10]

Part A

Q2a) Three dice are thrown at the same time. Find the probability of getting three two's, if it is known that the sum of the numbers on the dice was six.

(b) Explain Poisson distribution function. What is Binomial distribution? Give a real life example where each of them find their application.

[5+5]

Q3. A discrete source transmits message x_1, x_2 , and x_3 with the probabilities 0.3, 0.4 and 0.5. The source is connected to the channel according to the matrix given below.

	y_1	y_2	y_3
X_1	0.8	0.2	0
X_2	0	1	0
X_3	0	0.3	0.7

Calculate the following entropies: $H(X), H(Y), H(X,Y), H(X/Y), H(Y/X)$

[10]

Q4. There are 6 messages with their frequency of occurrence as tabulated below, apply Huffman coding to find the code word for each of these messages.

Explain the algorithm

Message	=	A	B	C	D	E	F
Frequency	=	5	25	7	15	4	12

[10]

Part B

Q5. Compare Amplitude Modulation with Frequency Modulation.

Draw the waveforms for each.

[10]

Q6. Explain the concept of Delta Modulation. Draw the block diagram and explain how a delta modulated signal is generated. How is Delta Modulation different from PCM?

[10]

Q7. What is the underlying principle of ASK signal? How is ASK signal generated and received. Explain with the help of necessary block diagrams.

[10]

x-x-x