2054
B.E. (Information Technology)
Second Semester
ESC-X08: Basic Information Theory and Communication

Time allowed: 3 Hours

Max. Marks: 50

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

x-x-x

Q1(i) In a stationary pouch there are 5 blue and 7 yellow erasers, two erasers are taken out one-by-one without replacement. Find the probability that first is blue and second is yellow.
(ii) What is the need for Block codes?
(iii) Pictorially explain the following distribution curves: Binomial, Poisson and Normal distribution.
(iv) Explain the fundamental of MSK signal.
(v) Give the principle of Phase modulation.

[5x2=10]

Part A

Q2a) Each letter of the word ATTRACT is written on a separate card. The cards are then shuffled, and four of them are drawn in succession. What is the probability of getting TACT?

b) From a pack of 52 cards, two cards are drawn. Find the probability that both are hearts or both are Queens.

[10]

Q3. A transmitter has an alphabet of four letters $[x_1, x_2, x_3, x_4]$ and the receiver has an alphabet of three letters $[y_1, y_2, y_3]$. The joint probability matrix is given by:

[10]

	y_1	y_2	y_3
X_1	0.3	0.05	0
X_2	0	0.25	0
X_3	0	0.15	0.05
X_4	0	0.05	0.15

Find P(X,Y)

Q4. By applying Shannon Fano coding, find the code word for each of the following messages. Then find the entropy.

[10]

[X] =	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8
[P] =	1/4	1/8	1/16	1/16	1/16	1/4	1/16	1/8

Part B

Q5. Describe Amplitude modulation. Draw its waveforms. Give the principle of generation of AM wave. What are advantages offered by Frequency modulation?

[10]

Q6. What is the main difference between analog modulation and digital modulation? Discuss different Digital modulation schemes.

[10]

Q7. Explain the principle of PSK and QPSK with necessary diagrams. How is differential PCM superior to PCM?

[10]

x-x-x