Total No. of Questions : 8]

SEAT No. :

P 3269

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T.E. (Electronics) (Semester - I)

DATA COMMUNICATION

(2012 Pattern)

Time : 2½ Hours] *[Max. Marks :70*

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain the different types of transmission media. **[6]**

b) Explain the properties of various line formats? Compare RZ, NRZ formats on the basis of above properties along with their merits and demerits. **[7]**

c) Explain FEC and ARQ systems of error control. Also explain

i) Stop and wait ARQ ii) Go back N ARQ

iii) Selective Repeat ARQ with neat Diagram. **[7]**

OR

Q2) a) Draw and Explain layered architecture of OSI Model. **[6]**

b) Explain inter symbol interference (ISI) and also how the Eye pattern is used to interpret the ISI. **[8]**

c) Explain in brief all the different types of error correcting techniques. **[6]**

Q3) a) What steps are involved in Huffman coding procedure? Evaluate the performance of Humman code over Shannon Fano code for large message eansemble with equal probabilities. **[8]**

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b) Apply the Huffman coding procedure for the following message ensemble. Also determine its efficiency **[8]**

X	X1	X2	X3	X4	X5	X6
P	0.4	0.28	0.12	0.08	0.08	0.04

OR

Q4) a) State and explain all the three Shannon's theorems of information theory. **[8]**

b) An analog signal is band limited to BHz and sampled at Nyquist rate. The samples are quantized into 4 levels. Each level represents one message. Thus there are 4 messages. The probabilities of occurrence of these messages are p1 = p4 = 1/8 and p2 = p3 = 3/8. Find out information rate of source. **[8]**

Q5) a) Derive the expression of Error probability of PSK. **[8]**

b) In digital CW communication, the bit rate of NRZ data stream is 1 Mbps, and carrier frequency is 100 Hz. Compute the symbol rate of transmission and the bandwidth requirement of the channel for

i) BPSK system.

ii) QPSK system. **[8]**

OR

Q6) a) Explain with the help of neat block diagram 16 bit QAM transmitter and receiver. Also give the mathematical analysis. **[8]**

b) Explain the working of DPSK transmitter and receiver **[8]**

Q7) a) Explain the working of DS-SS transmitter and receiver. **[9]**

b) A PN sequence is generated using a feedback shift register of length m = 4, the chip rate is 107 chips/sec. Find the following parameters :

i) PN sequence length

ii) Chip duration of the PN sequence

iii) PN sequence period. **[9]**

OR

Q8) a) Explain working principle of slotted ALOHA, ALOHA, CSMA and CSMA/CD. **[9]**

b) Draw and explain the block diagram of FH-SS transmitter and receiver. **[9]**

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