Seat No.	

SE - 464

Total No. of Pages : 2

T.E. (Electronics & Telecommunication) (Semester - V) Examination, November - 2018
DIGITAL COMMUNICATION (Revised)
Sub. Code : 66318

Day and Date : Friday, 30 - 11 - 2018

Time : 10.00 a.m. to 01.00 p.m.

Total Marks : 100

Instructions:
1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.

SECTION - I

Q1) Solve any two.

a) Define probability. State it's properties. Also explain joint and conditional probability. [8]

b) Explain Ensemble mean, Time average and Ergodicity of random process. [8]

c) A certain random variable has the CDF given by, [8]

$$Fx(x) = 0 \quad \text{for } x \leq 0$$
$$= k.x^2 \quad \text{for } 0 < x \leq 10$$
$$= 100.k \quad \text{for } x > 10$$

i) Calculate the value of k.

ii) Find the values of $P(x \leq 5)$ and $P(5 < x \leq 7)$

Q2) Solve any two.

a) Explain Shannon-Hartley theorem for channel capacity. [8]

b) Explain different steps in Huffman coding technique with suitable example. [8]

c) Derive the expression for entropy. [8]

Q3) Solve any two.

a) With the help of neat block diagram, explain the pulse code modulation technique. [9]

b) Explain with diagram, adaptive delta modulation. [9]

c) Explain different probability distribution models. [9]

P.T.O.

SECTION - II

Q4) Solve any two.

a) Draw and explain Scrambler and Unscrambler. [8]

b) Explain ISI and Eye diagram. [8]

c) Explain and draw different line codes. [8]

Q5) Solve any two.

a) Explain with neat diagram BFSK modulator and coherent BFSK demodulator. [8]

b) Explain QAM with diagram. [8]

c) Explain FHSS technique. [8]

Q6) Solve any two.

a) Draw and explain (n, k) cyclic code encoder. [9]

b) Draw the encoder for a (7,4) cyclic Hamming code generated by the generator polynomial $G(D) = 1 + D + D^3$. [9]

c) The generator matrix for a (6,3) block code is given below. Find all the code vectors of this code. [9]

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

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