

SL - 779

Total No. of Pages : 2

Seat No.	
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T.E. (Electronics and Telecommunication) (Semester - V)
Examination, May-2017
DIGITAL COMMUNICATION (Revised)
Sub. Code : 66318

Day and Date : Friday, 19 -05 - 2017

Total Marks : 100

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

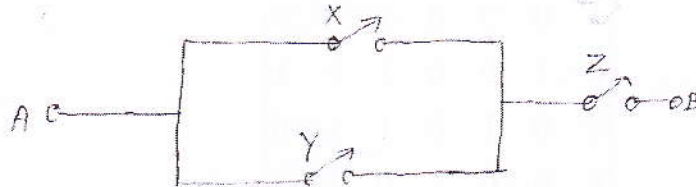
- Instructions :
- 1) All questions are compulsory
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data if necessary.

SECTION - I

Q1) Solve any two.

[8]

- a) Explain different probability distribution models.
- b) Explain power spectral density of stationary random process. [8]
- c) Assume that X,Y,Z denote the events that the switches X,Y and Z are closed respectively. Assume that the probability that each switch may fail is equal to "q" assuming. that the switch actions are independent. Calculate the probability that a closed path exists between the terminals A and B, if $Q = 0.5$ [8]



Q2) Solve any two.

[8]

- a) Explain different types of channel and their models.
- b) Define entropy. State properties of entropy. Also derive the expression for the entropy. [8]
- c) Consider the five source symbols (messages) of a discrete memoryless source and their probabilities as shown below. follow the Huffman's algorithm to find the codewords for each message. Also find the average codeword length. and the average information per Message. Assume $M = 2$ [8]

Message	:	M_1	M_2	M_3	M_4	M_5
Probability	:	0.4	0.2	0.2	0.1	0.1

P.T.O.

Q3) Solve any two.

- a) Explain with diagram DPCM transmitter and receiver. [9]
- b) What is slope overload distortion and granular noise in delta modulation? Explain how it is removed in ADM. [9]
- c) What is uniform quantization? Derive an expression for signal to noise ratio in uniform quantization method. [9]

SECTION - II

Q4) Solve any two.

- a) Draw and explain Duobinary baseband PAM system. [8]
- b) Explain optimum detection using ML criteria. [8]
- c) Explain different line codes. [8]

Q5) Solve any two.

- a) Compare ASK, FSK and PSK modulation techniques. [8]
- b) Explain with diagram BPSK modulation and demodulation. [8]
- c) Explain different spread spectrum techniques. [8]

Q6) Solve any two.

- a) A (7,4) linear block code of which generator matrix is given as, [9]

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

- i) Find code vector for any six messages.
- ii) Write the parity check matrix of this code.
- b) Draw the encoder for a (7,4) Cyclic mamming code generated by the generator polynomial. [9]
 $G(D) = 1 + D + D^3$. Also obtain the codeword for a message input of $m = m_0 m_1 m_2 m_3 = 1010$.
- c) Draw and explain syndrome decoder for (n,k) block codes. [9]

