

B.TECH. SEM -V (E & TC ENGG.) 2014 COURSE (CBCS) :

SUMMER - 2018

SUBJECT: DIGITAL COMMUNICATION

Day: Wednesday S-2018-2382 Time: 10.00 AM TO 01.00 PM
Date: 23/05/2018 Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Draw neat and labeled diagrams **WHEREVER** necessary.

- Q.1 a) How errors of delta modulation can be avoided by Adaptive Delta Modulation (ADM)? (07)**
b) What is Aliasing effect? (03)

OR

- Q.1 a) What is quantization process? (05)**
b) What are the limitations of Delta Modulation? (05)

- Q.2 a) Define the terms: (02)**

i) Correlation ii) Mean

- b) The joint Probability function of two discrete random variables X and Y is given by. (08)**

$$f(x,y) = Cx^2y \quad \text{for } x = 1,2 \\ y = 0,1,2 \\ = 0 \quad \text{otherwise}$$

- Find: i) The value of C ii) $P(x > 1, Y \leq 1)$ and
iii) Marginal Probability Functions of X and Y.

OR

- Q.2 a) What is Gaussian distribution? State properties of Gaussian PDF. (07)**
b) What is Power Spectral Density? (03)

- Q.3 a) Why Synchronization is needed in digital Communication? Explain bit Synchronization. (07)**
b) What is Inter Symbol Interference (ISI)? (03)

OR

- Q.3 a) Draw following Line coding formats for bit stream. 100100110101 (05)**
i) Polar NRZ ii) Bipolar RZ
ii) Split phase Manchester iv) Polar RZ v) Differential
b) Write short note on digital multiplexer. (05)

- Q.4 a) What is QPSK? Explain with diagram QPSK transmitter and receiver. (08)**
b) What is QAM? (02)

OR

- Q.4 a) Explain generation and detection of BPSK. (06)**
b) How phase continuity is maintained in MSK? (04)

- Q.5 a) Derive Probability of error for BFSK system. (06)**
b) State Properties of matched filter. (04)

OR

- Q.5 a) Derive expression for Probability of error for optimum filter. (06)**
b) Write short note on integrate and dump filter. (04)

- Q.6 a) What is frequency Hopping spread spectrum (FHSS)? Explain with diagram transmitter and receiver of FHSS. (07)**
b) What is CDMA? (03)

OR

- Q.6 a) Compare Slow frequency hopping and Fast Frequency Hopping. (04)**
b) What is signal space Dimensionality and Processing gain? (06)