*Total No. of Questions : 8]* *[Total No. of Printed Pages : 2*

**Roll No** .....

# IT-5004 (CBGS)

## B.E. V Semester

Examination, November 2018

## Choice Based Grading System (CBGS)

## Digital Communication

***Time : Three Hours***

***Maximum Marks : 70***

***Note :*** i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Write benefits of digital communication over analog communication. Differentiate bit rate, band rate and bandwidth along with proper example. 7
   b) What is the need of Modulation in digital communication? Briefly discuss few methods to do so. 7

2. a) Explain synchronous and asynchronous time division multiplexing of PCM signal. 7
   b) What are the limitations of Delta Modulation? How they can be removed? 7

3. a) Explain and compare PSK with DPSK. 7
   b) Discuss the following in brief: 7
      i) BFSK
      ii) QAM

4. a) What do you mean by Channel capacity? Discuss Noise free, Symmetric and binary symmetric channel briefly. 7
   b) What is Entropy? Show that the entropy is maximum when all the message are equi-probable. Assume M=3. 7





5. a) Discuss Shannon's theorem. 7
   b) Distinguish between irreducible and separable codes. What is coding Efficiency? 7

6. a) Apply Shannon-Fano coding for following where M=2 7

   $[X] = [x_1 \quad x_2 \quad x_3 \quad x_4 \quad x_5 \quad x_6 \quad x_7 \quad x_8]$

   [P] = [1/4, 1/8, 1/16, 1/16, 1/16, 1/4, 1/16, 1/8]

   b) Discuss advantages and disadvantages of synchronous and asynchronous data transmission techniques. 7

7. a) Draw the following data format for the bit combination 111000100, using polar NRZ, polar RZ, unipolar RZ. 7
   b) What is Line configuration? Differentiate point to point with point to multipoint configuration. 7

8. Write short notes on (any two) 14
   a) Huffman coding
   b) Capacity of Gaussian channel
   c) M-Ary PSK
   d) Quantization error

******