

Roll No

IT-5004 (CBGS)**B.E. V Semester**

Examination, December 2017

Choice Based Grading System (CBGS)**Digital Communication**

Time : Three Hours

Maximum Marks : 70

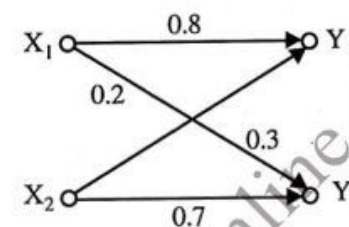
Note: Give the answer any five questions only. Each question has equal marks.

1. a) Explain the process of Quantization. What is Quantization Error? Why companding is used in the process of quantization?
b) What do you understand by Digital communication? Explain the features of digital communication and also write the pros and cons of it.
2. a) Explain different modes of transmissions with example in detail.
b) Write comparison between PCM, Delta Modulation, Adaptive Delta Modulation and Differential Pulse Code Modulation.
3. a) Describe the coherent detection of BFSK signals. What should be the relationship between bit rate and frequency shift for a better performance?
b) Apply the Shannon-Fanno coding procedure to find coding efficiency for the following message ensemble. (Take $M=2$)

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

$$[p] = [1/4 \ 1/8 \ 1/16 \ 1/16 \ 1/16 \ 1/4 \ 1/16 \ 1/8]$$

4. a) Write the difference between the following:
 - i) Parallel and Serial Transmission
 - ii) Synchronous and Asynchronous Transmission
- b) A continuous signal is band limited to 5kHz. The signal is quantized in 8 levels of a PCM system with the probabilities. 0.25, 0.2, 0.1, 0.1, 0.05, 0.05, 0.05, 0.05. Calculate the entropy and the rate of information.
5. a) Explain the concept of M-ary FSK with the help of block diagram.
b) Find the channel capacity of the channel shown in the figure.



Given $P(X_1) = 0.6$ and $P(X_2) = 0.4$

6. a) What do you mean by line encoding? Explain RZ, NRZ coding with suitable example.
b) State Shannon-Hartley theorem for capacity of a Gaussian channel:
i.e. $C = W \log[1 + S/N]$ bits/sec.
7. a) Draw the block diagram of QPSK system and explain its working. Compare the bandwidth of QPSK system with that of BPSK system.
b) Discuss Quantization noise effects in Delta Modulation. Also write the advantages and disadvantages of Delta Modulation.
8. Write short note on:
 - a) Block Codes
 - b) Cyclic Codes
 - c) Channel Capacity
