



B.TECH.

**THEORY EXAMINATION (SEM-VI) 2016-17
ANALOG AND DIGITAL COMMUNICATION**

Time : 3 Hours

Max. Marks : 100

Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.

SECTION – A

1. Explain the following:

10 x 2 = 20

- Define Modulation.
- Write two advantages of Digital communication over Analog communication.
- What do you mean by figure of merit?
- Define the term 'frequency deviation'.
- Calculate the power content of an AM signal with carrier power 100kW having 60% modulation.
- Why FSK is preferred over ASK?
- Define information.
- Explain the nyquist criteria for sampling.
- Define depth of modulation.
- What is entropy?

SECTION – B

2. Attempt any five of the following questions:

5 x 10 = 50

- What is delta modulation? Discuss the errors in Delta modulation technique.
- Explain the operation of Square law modulator for the generation of AM signal with the help of proper circuit representation.
- The antenna current of an AM transmitter is 10 A when only the carrier is sent, but it increase to 10.63 A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current when the percentage of modulation changes to 0.8.
- Briefly explain the generation of Frequency Shift Keying signal. Also, discuss its probability of error.
- Explain the following terms:**
 - Thermal Noise
 - Shot noise
 - Noise Figure
 - Signal to Noise Ratio
 - Equivalent Noise Temperature
- Derive the expression for channel capacity of a continuous channel.
- Explain the generation of SSB-SC signal with the help of suitable block diagram and expressions.
- Compare the following:**
 - TDM and FDM
 - FM and PM

SECTION – C

Attempt any two of the following questions:

2 x 15 = 30

- Draw and explain the block diagram for indirect method of FM generation. Also, find the frequency deviation and bandwidth of a frequency modulated signal given by $10\cos(2\pi \times 10^6 t + 5\sin 6\pi \times 10^3 t)$.
- Design a binary Huffman code for a discrete source having seven independent symbols having probabilities 0.25, 0.25, 0.125, 0.125, 0.125, 0.0625 and 0.0625 respectively. Also, calculate the efficiency of this code.
- Describe the various performance parameters of Radio Receivers. Also mention the advantages of superheterodyne receiver over TRF.

