Sem-III (IT) CBGS 18/05/16

Principles of Analog & Digital Comm.

QP Code : 30625

(3 Hours) [Total Marks : 80

N.B. : (1) Question No.1 is compulsory.
(2) Out of remaining attempt any **three**.
(3) Assume & mention suitable data wherever required.
(4) Figures to **right** indicates **full** marks.

1. Solve **any four** :- 20
   (a) State the advantages of digital communication over analog communication. Justify each point.
   (b) Define the following terms.
   (i) Noise figure (ii) Noise temperature
   (iii) Noise bandwidth (iv) Noise voltage (v) Modulation.
   (c) Compare pulse code modulation and delta modulation.
   (d) Explain in short pre-emphasis and De-emphasis.
   (e) What is BPSK signal. Draw the BPSK signal for the following binary signal 10111010.

2. (a) Define signal to noise ratio. Explain the effect of cascade connection on a signal to noise ratio. An amplifier with 10dB noise figure and 4 dB power gain is cascaded with a second amplifier which has a 10dB power gain. What is overall noise figure and power gain. 10
   (b) State and prove the following properties of Fourier transform with example 10
   (i) Time shifting (ii) Convolution in time domain

3. (a) An amplitude modulated waveform has a form $x(t)= [10 (1+ 0.6 \cos 2000 \pi t+ 0.4 \cos 4000 \pi t) \cos 20000 \pi t)]$ 10
   (i) Sketch the amplitude spectrum of X(t).
   (ii) Find the power spectral of each spectral component including carrier
   (iii) Find the total power and sideband power
   (iv) What is the modulation index

[TURN OVER

(b) What are the limitations of TRF receiver. Explain how these limitations are avoided using superheterodyne receiver. 10

4. (a) With the help of neat circuit diagram and phasor diagram explain the working of Foster Seelay discriminator. 10

(b) What is multiplexing in communication system. Draw and explain in brief the transmitter and receiver of FDM. 10

5. (a) State and prove sampling theorem for low pass band limited signal. 10

(b) Draw the block diagram of PWM generator. Explain the working giving waveforms at the output of each block. 10

6. (a) Explain slope overload error and hunting error in Deltamodulation. Derive the condition to avoid slope overload distortion. 10

(b) Explain the generation and detection of FSK signal. 10