I.T/CBGS/III/P.A&DC.

Principles of Analog & Digital Comm⁰/02·12·16

(3 Hours) [Total Marks : 80]

Note: 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. Attempt **any four** from the following. 20

(a) An amplifier has a bandwidth of 4 MHz with 10 K as the input resistor. Calculate the rms noise voltage at the input to this amplifier, if the room temperature is 25°C.

(b) Explain Eye pattern with neat diagram.

(c) Explain Quantization.

(d) State and prove the differentiation in time domain property of the Fourier Transform.

(e) What is diagonal clipping and explain how it can be avoided.

2. a) The AM Transmitter develops an unmodulated power o/p of 400 Watts across a 50 ohms resistive load. The carrier is modulated by a sinusoidal signal with a modulation index of 0.8. Assuming f_m= 5KHz and f_c= 1MHz. 10

(i) Obtain the value of carrier amplitude V_c and hence write the expression for AM signal.

(ii) Find the total sideband power.

(iii) Draw the AM wave for the given modulation index.

(b) Explain any one generation method of SSBSC AM. 10

3. a) Derive the mathematical expression for FM. 10
   b) Explain Foster seeley descriminator with neat block diagram and compare the performance with Ratio detector. 10

4. a) State and prove Sampling theorem and explain the aliasing error. 10
   b) Explain generation and demodulation of PPM. 10

5. a) Explain the Delta modulator Transmitter and receiver with neat block diagrams. 10
   b) The binary data 11010101 is transmitted over a baseband channel. Draw the waveform for transmitted data using the following data formats. 10

(i) Unipolar NRZ (ii) Unipolar RZ (iii) Bipolar RZ (iv) Split phase Manchester (v) Polar quaternary NRZ.

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6. Answer **any four**   20
     (a) Explain wired communication channel.
     (b) Derive Friss formula.
     (c) Explain QPSK.
     (d) Compare TDM and FDM.
     (e) Explain BFSK Transmitter.