Q. P. Code : 37358

Time : 3 hours   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.

Q.1. Solve any four   [20]

a). Compare analog modulation and digital modulation.

b). Explain FM noise triangle

c). Compare eye pattern with neat diagram..

d). Explain the process of quantization..

e). Explain bitrate and baud rate.

Q.2   **a).** Explain the following 1). Shot noise   2). Equivalent noise temperature.   [5]

b). Derive the formula for equivalent noise temperature. An amplifier has a noise
figure of 6dB..Calculate its equivalent noise temperature.   [5]

c). State and prove the following properties of Fourier transform with example

i) Time shifting ii) Differentiation in time domain   [10]

Q.3.   a) The AM Transmitter develops an unmodulated power o/p of 400 Watts across a
50Ω resistive load. The carrier is modulated by a sinusoidal signal with a modulation index of
0.8. Assuming f_m= 5 KHz and f_c= 1MHz.

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

(ii) Find the total sideband power.

(iii) Draw the AM wave for the given modulation index.   [10]

b). What are the drawbacks of TRF receiver. How it is overcome by super heterodyne
receiver. Explain in brief..   [10]

Q.4   **a).** With the help of neat block diagram explain in brief indirect method of FM
generation.   [10]

b). what is multiplexing in communication system. Describe the multiplexing
hierarchy for digital multiplexing.   [10]

Q.5. **a).** State sampling theorem and explain anti- aliasing filter. [6]

b).A bandpass signal has a spectral range that extends from 20 KHz to 82KHz. Find the sampling frequency fs. [4]

c). Draw the block diagram of PWM generator. Explain the working giving waveforms at the output of each block. [10]

Q6 **a).**How is adaptive delta modulation is better than linear delta modulation? Draw block diagram of adaptive delta modulation and explain each block in detail. [10].

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

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