Roll No. ....   Total Pages : 3

BT-8/M-20   **38021**

DIGITAL COMMUNICATION ENGG.

Paper–ELE-424E

Time Allowed : 3 Hours]   [Maximum Marks : 100

Note   :   Attempt five questions in all, selecting at least one question from each Unit. All questions carry equal marks.

UNIT–I

1.   (a)   Define the quantization error. Derive the expression for quantized noise power.   10

     (b)   Write a brief notes on the following :

          (i) Gram Schmidt orthogonalization.

          (ii) A Law compressor.   5,5

2.   (a)   State and prove Sampling theorem in time domain.   10

     (b)   (i)   What is aliasing ? How it can be reduced ?

                                                            5

          (ii) What is quantization ? Explain the working principle of quantizer.   5

UNIT–II

3.   (a)   Explain working principle of PAM along with mathematical analysis of flat top PAM. Draw its spectrum.   10

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(b) Compare PCM and DPCM on the basis of implementation complexity. 3

(c) What is the slope overload distortion and granular noise in delta modulation and how it is removed in ADM ? 7

4. (a) In a binary PCM system the output signal to quantization noise ratio is to be held to a minimum value of 40bB. Determine the number of required levels and find the corresponding output signal to quantization ratio. 4

(b) Discuss the multiplexing hierarchy for digital Communication. How bitrate is calculated at each level ? 8

(c) Explain in detail MSK and its signal space representation. 8

UNIT–III

5. (a) Prove that the output signal of matched filter is proportional to a shifted version of the autocorrelation function of the input signal to which the filter is matched. 10

(b) Draw and explain a block diagram for baseband binary data transmission system. List the important observations. 10

6. (a) Write notes on the following :

   (i) Duo binary signaling.

   (ii) Tapped delay line equalization. 10

(b) Explain LMS algorithm in detail. What are its applications?   10

UNIT–IV

7. (a) Write notes on the following :

     (i) Pseudo noise sequence generation.

     (ii) DSSS using BPSK.   10

(b) Compare frequency hop spreading and time hop spreading.   10

8. Discuss the modulation and reception of spread spectrum signal.   20

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