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Question Paper Code : 63183

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Electronics and Communication Engineering

EC 1351 A — DIGITAL COMMUNICATION TECHNIQUES

(Regulations 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by slope-over load distortion in a DM system? How can it be avoided?
2. What is companding? Write equation for A-law companding.
3. Draw the diagram of adaptive equalizer.
4. What is inter symbol interference?
5. What is carrier synchronisation?
6. State two valid differences between pass band and base band transmission.
7. Define discrete memoryless channel.
8. What is linear block code?
9. List the properties of pseudo noise sequences.
10. Define processing gain and jamming-margin of DS-SS system.

PART B — (5 × 16 = 80 marks)

11. (a) With neat block diagrams, explain the concept, principle, generation and detection of Pulse Code Modulation signals. Comment on its merits and demerits.

Or

- (b) (i) Explain the concept of sampling process. Draw relevant diagrams. (6)
- (ii) With neat diagrams explain adaptive delta modulation system. (10)

12. (a) Draw the block diagram of band limited communication system with duobinary encoded source and explain with necessary derivation.

Or

- (b) Explain the implementation of the M-ary waveform receiver using matched filter with neat block diagram and derive an expression for error probability.
13. (a) Explain with block diagram the coherent binary FSK transmitter and receiver. Also derive its probability of error.

Or

- (b) Draw the block diagram of coherent QPSK modulation technique and explain with signal space diagram. Derive its probability of error.
14. (a) A generator matrix of (6, 3) linear block code is given as :

$$G = \begin{matrix} 1 & 0 & 0 & 1 & 1 & 1 \\ & 0 & 1 & 0 & 1 & 1 & 0 \\ & & 0 & 0 & 1 & 0 & 1 & 1 \end{matrix}$$

Determine the d_{min} for the above code. Comment on error correction and detection capabilities. If the received sequence is 1 0 1 1 0 1, determine the message bit sequence.

Or

- (b) Explain viterbi algorithm for decoding of convolutional codes with suitable example.
15. (a) With the help of the block diagram, explain the operation of direct sequence spread spectrum BPSK transmitter and receiver.

Or

- (b) Describe slow frequency hopping spread spectrum technique in detail. Also state the advantages and disadvantages of FH-SS system.