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**Question Paper Code : 51215**

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Sixth Semester

Electronics and Communication Engineering

EC 1351 A — DIGITAL COMMUNICATION TECHNIQUES

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define sampling theorem.
2. State the advantages of adaptive delta modulation.
3. What is inter symbol interference?
4. What is eye pattern?
5. State the two types of methods for detection of passband signal.
6. What is differential phase shift keying?
7. What is cyclic codes?
8. Define constraint length and code rate of a convolution 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 the help of neat block diagram, explain the transmitter and receiver of pulse code modulation. (16)

Or

- (b) Describe the operation of delta modulation in detail. Also state the advantages of disadvantages of DM. (16)

12. (a) Derive the expression for transfer function and impulse response of the matched filter. (16)

Or

- (b) Write short notes on :
- (i) Duobinary encoding system (8)
  - (ii) Adaptive Equalization. (8)
13. (a) Explain in detail, the operation of QPSK transmitter and receiver. (16)

Or

- (b) Write short notes on carrier and symbol synchronization. (16)
14. (a) The parity check matrix of a (7,4) hamming code is given as follows.

$$H = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}$$

Calculate the syndrome vector for single bit error. (16)

Or

- (b) Illustrate with an example, explain viterbi decoding algorithm. (16)
15. (a) With the help of the block diagram, explain the operation of direct sequence spread spectrum BPSK transmitter and receiver. (16)

Or

- (b) Describe slow frequency hopping spread spectrum technique in detail. Also state the advantages and disadvantages of FH-SS system. (16)