

Reg. No. :

Question Paper Code : 20098

M.E./M.Tech. DEGREE EXAMINATION, JANUARY 2011.

First Semester

Computer and Communication

(Common to Communication Systems)

250101 — MODERN DIGITAL COMMUNICATION TECHNIQUES

(Regulation 2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by coherent and non-coherent detection?
2. What are the advantages of MSK when compared to QPSK?
3. What are the disadvantages of multicarrier OFDM modulation system?
4. What is meant by guard time and cyclic extension in OFDM?
5. State Shannon's channel coding theorem.
6. Define linear block code.
7. What is meant by systematic convolutional code?
8. What is meant by constraint length and free distance for convolutional code?
9. State Nyquist pulse shaping criterion for zero ISI.
10. What is meant by correlative coding?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the non-coherent detection of binary FSK signals with neat block diagram. (9)
(ii) Explain about Gaussian MSK. (7)

Or

- (b) Draw the block diagram of M-ary PSK transmitter and receiver and explain in detail.
12. (a) Draw the block diagram of a multicarrier OFDM digital communication system and explain function of each block in detail.

Or

- (b) Explain in detail any two methods to reduce peak-to-average power ratio in multicarrier OFDM system.
13. (a) (i) Explain orthogonal and bioorthogonal binary codes. (10)
(ii) Explain binary coded DPSK with infinite quantization. (6)

Or

- (b) (i) Explain the error detecting and correcting capabilities of linear block code. (6)
(ii) Write short notes on :
(1) BCH code and
(2) Read-Solomon Code. (5 + 5)

14. (a) A convolutional code is described by the following generator sequences :

$$g_1 = (1 \ 0 \ 0)$$

$$g_2 = (1 \ 0 \ 1)$$

$$g_3 = (1 \ 1 \ 1)$$

- (i) Draw the encoder diagram for this code.
(ii) Draw the state and trellis diagrams for this code.
(iii) Find the code word corresponding to the message sequence 10101. (4 + 8 + 4)

Or

- (b) (i) Explain Viterbi decoding algorithm for convolutional code. (8)
(ii) Explain Turbo encoder with block diagram. (8)

15. (a) Explain duo-binary signalling scheme without and with precoder for controlled ISI.

Or

- (b) Draw the block diagram of adaptive linear equalization and explain with adaptive algorithm.
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