LB
28/5/13 AN

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 21376

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Seventh Semester

Electronics and Communication Engineering

EC 2401/EC 71 — WIRELESS COMMUNICATION

(Regulation 2008)

(Common to PTEC 2401 — Wireless Communication for B.E. (Part-Time) Sixth Semester Electronics and Communication Engineering – Regulation 2009)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Define: Frequency reuse.

2. State the operating principle of adhoc networks.

3. State the differences between small-scale and large-scale fading.

4. Define: Snells law.

5. Mention any two criteria for choosing a modulation technique for a specific wireless application.

6. Draw the structure of generic optimum receiver.

7. Define: Hamming distance.

8. State the principle of diversity.

9. Define: Direct Sequence-Speed Spectrum.

10. State the goals of a standard IMT-2000.

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) Explain the methods for increasing the capacity of wireless cellular networks. (10)

(ii) Brief about the principle of Time Division Multiple Access (TDMA). (6)

Or

(b) (i) Describe in detail about the effects of multipath propagation in wireless environment. (10)

(ii) A Communication system has the following parameters:

P_1= 5W, G_t (dB) = 13dB, G_r (dB) = 17dB, d = 80km, f = 3GHz.

Determine the value of the received power. (6)

12. (a) (i) Explain the time-variant two-path model of a wireless propagation channel. (8)

(ii) Brief about the properties of Rayleigh distribution. (8)

Or

(b) (i) Explain the narrow band modeling methods for Short scale fading and Long scale fading. (10)

(ii) Brief about the properties of Nakagami distribution. (6)

13. (a) (i) Explain the principle of $\pi/4$ - Differential Quadrature-Phase Shift Keying from a signal space diagram. (8)

(ii) Derive the expression for probability of error in Flat-Fading channels. (8)

Or

(b) (i) Explain the principle of Minimum Shift Keying (MSK) modulation and derive the expression for power spectral density. (8)

(ii) Derive the expression for probability of error in Frequency-Dispersive Fading channels. (8)

14. (a) (i) Explain any two diversity techniques to combat small-scale fading. (8)

(ii) Describe any two adaptation algorithms for Mean Square Error Equalizers. (8)

Or

(b) (i) Write short notes on Linear Predictive voCoder. (8)

(ii) The generator matrix for a linear binary code is

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

(1) Express G in systematic [I /P] form.

(2) Determine the parity check matrix H for the code.

(3) Construct the table of syndromes for the code.

(4) Determine the minimum distance of the code. (8)

15. (a) (i) Explain the principle of cellular code division multiple access systems. (8)

(ii) Brief about the properties of spreading codes used in CDMA systems. (8)

Or

(b) (i) Describe in detail about the operation of OFDM transceiver structures. (8)

(ii) Explain the physical layer features of WCDMA systems. (8)