

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Seventh Semester

Electronics and Communication Engineering

EC 2401/EC 71/10144 EC 701 — WIRELESS COMMUNICATION

(Regulation 2008/2010)

(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 × 2 = 20 marks)

1. What are three most important effects of small-scale multipath propagation?
2. What is a multiple access technique?
3. State the difference between Narrowband and wideband systems.
4. Find the far-field distance for an antenna with maximum dimension of 1 m and operating frequency of 900 MHz.
5. Give the expression for bit error probability of Gaussian Minimum shift keying modulation.
6. What is fading and Doppler spread?
7. What is Diversity?
8. What is Equalization?
9. What is a PN sequence? Give its significance in spread spectrum modulation technique.
10. What is DECT?

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PART B — (5 × 16 = 80 marks)

11. (a) Discuss the types of services, requirements, spectrum limitations and noise considerations of wireless communications. (16)

Or

- (b) Explain the principle of Cellular Networks and various types of Handoff techniques. (16)

12. (a) (i) Briefly explain the factors that influence small-scale fading. (8)
(ii) If a transmitter produces 50 W of power, express the transmit power in units of dBm and dBW. If 50 W is applied to a unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100 m from the antenna. What is P_r (10 km)? Assume unity gain for the receiver antenna. (8)

Or

- (b) (i) Briefly explain the three basic propagation mechanisms which impact propagation in a mobile communication system. (8)
(ii) What is Brewster angle? Calculate the Brewster angle for a wave impinging on ground having a permittivity of $\epsilon_r = 4$. (8)

13. (a) (i) Explain the Nyquist criterion for ISI cancellation. (8)
(ii) With transfer function, explain the raised cosine roll off filter. (8)

Or

- (b) (i) Explain the QPSK transmission and detection techniques. (8)
(ii) Explain the performance of Digital modulation in slow flat-fading channels. (8)

14. (a) Explain in detail about :

- (i) Linear Equalizers. (8)
(ii) Non Linear Equalizers. (8)

Or

- (b) (i) With block diagram, explain the operation of a RAKE receiver. (8)
(ii) Briefly explain the frequency domain coding of speech signals. (8)

15. (a) Explain in detail about :

(i) Direct sequence spread spectrum technique. (8)

(ii) Frequency hopped spread spectrum technique. (8)

Or

(b) Discuss in detail about second generation (2G) and third generation (3G) wireless networks and standards. (16)
