

Reg. No. :

Question Paper Code : 11346

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2012.

Seventh Semester

Electronics and Communication Engineering

EC 2401/EC 71/10144 EC 701 — 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 × 2 = 20 marks)

1. What is flat fading?
2. Define signal to self-interference ratio.
3. Distinguish between Narrowband and Wideband systems.
4. What is Link Budget calculation?
5. Find the 3-dB bandwidth for a Gaussian low pass filter used to produce 0.25 GMSK with a channel data rate of $R_b = 270$ Kbps. What is the 90% power bandwidth in the RF channel?
6. What is slotted frequency hopping?
7. Assume four branch diversity is used, where each branch receives an independent Rayleigh fading signal. If the average SNR is 20 dB, determine the probability that the SNR will drop below 10 dB. Compare this with the case of a single receiver without diversity.

8. Define coding gain.
9. What is duplexing?
10. What is the speech codes used in IS-95 system? Why?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain about the factors that influence small-scale fading. (10)
- (ii) Find the average fade duration for threshold levels $\rho = 0.01$, $\rho = 0.1$ and $\rho = 1$, when the Doppler frequency is 200 Hz. (6)

Or

- (b) (i) Write a note on Noise and Interference Limited Systems. (8)
 - (ii) Discuss the principles of Cellular Networks. (8)
12. (a) (i) How the received signal strength is predicted using the free space propagation model? Explain. (10)
 - (ii) Find the far-field distance for an antenna with maximum dimension of 1 m and operating frequency of 900 MHz. (6)

Or

- (b) (i) With system theoretic description explain the characteristics of Time-Dispersive channels. (8)
 - (ii) Explain the three basic propagation mechanisms in a mobile communication system. (8)
13. (a) (i) Briefly explain the structure of a Wireless communication link. (6)
 - (ii) With block diagram, explain the MSK transmitter and receiver. Derive an expression for MSK and its power spectrum. (10)

Or

- (b) Derive an expression for :
 - (i) M-ary phase shift keying and (8)
 - (ii) M-ary quadrature amplitude modulation.Also derive an expression for their bit error probability. (8)

14. (a) Explain in detail about :
- (i) Polarization diversity. (6)
 - (ii) Time diversity (5)
 - (iii) Frequency diversity. (5)

Or

- (b) (i) Explain the basic idea about linear and behind decision feedback equalisers and derive an expression for its minimum mean square error. (8)
- (ii) With a suitable diagram, explain the channel coding and sneech coding techniques. (8)
15. (a) (i) Discuss in detail about cellular code division multiple access systems with neat diagrams. (8)
- (ii) Write a short notes on transceiver implementation. (8)

Or

- (b) (i) Explain with neat diagram of orthogonal frequency division multiplexing. (8)
- (ii) Write a note on second generation and third generation wireless networks and standards. (8)