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**Question Paper Code : 23403**

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

Eighth Semester

Electronics and Communication Engineering

EC 1451 — MOBILE COMMUNICATION

(Common to B.E. (Part-Time) Seventh Semester, Regulation 2005)

(Regulation 2004/2007)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Grade of Service and Trunking Efficiency in cellular system.
2. Write the concept of cell splitting.
3. Find the height of the obstacle required to induce 6dB diffraction loss. ( $h_t = 50\text{m}$ ,  $h_r = 25\text{m}$ ,  $d_1 = 10\text{ km}$ ,  $d_2 = 2\text{ km}$  and  $f_c = 900\text{ MHz}$ )
4. List the types of fading.
5. Write the concept of M-ary FSK.
6. Assume four branch diversity is used where each branch receives an independent Rayleigh fading signal. If the average SNR is 20dB, determine the probability that the SNR will drop below 10dB. Compare this with the case of single receiver without diversity.
7. Write the advantage of CDMA.
8. What is SDMA?
9. Write the functions of Fast Associated Control Channels in GSM.
10. Write short note on DECT.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the various handoff strategies and practical considerations in cellular system. (8)
- (ii) Explain how Cell sectoring improves capacity. (8)

Or

- (b) (i) A receiver in an urban cellular system detects a 1 mW signal at  $d = d_0 = 1$  meter from the transmitter. In order to mitigate co-channel interference effects, it is required that the signal received at any base station receiver from another base station transmitter which operates with the same channel must be below -110 dBm. A measurement team has determined that the average path loss exponent in the system is 3. Determine the major radius of each cell if a 7 cell reuse pattern is used. What is the major radius if a 4 cell reuse pattern is used? (8)
- (ii) Draw the timing diagram illustrating how a call to a mobile user initiated by a land line subscriber is established. (8)
12. (a) (i) Derive the expression for the power received in 2-ray ground reflection model. (8)
- (ii) Explain any one outdoor propagation model. (8)

Or

- (b) (i) Derive the impulse response model for a multipath channel. (8)
- (ii) Discuss the parameters of mobile radio channel. (8)
13. (a) Describe the performance of digital modulation in various fading channels. (16)

Or

- (b) Explain the equalization techniques in detail. (16)
14. (a) Discuss the features of FDMA and TDMA. (16)

Or

- (b) Explain the coders used for mobile communication. (16)
15. (a) (i) Discuss GSM system architecture with diagram. (10)
- (ii) Explain the channel types in GSM. (6)

Or

- (b) Discuss the features of IS-95 with neat block diagram. (16)