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Question Paper Code : S 4611

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009

Eighth Semester

Electronics and Communication Engineering

EC 047 — CELLULAR MOBILE COMMUNICATION

(Regulation 2001)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate control from voice channels.
2. What do you mean by roaming?
3. What is meant by handoff? Why it is needed?
4. Mention the importance of FDMA.
5. A transmitter produces 50 W of power express the transmit power in units of dBm and dBW.
6. Define Coherence Bandwidth.
7. What are the advantages of Diversity techniques?
8. What are Trellis code and Turbo codes?
9. Explain how microscopic diversity techniques overcome small scale fading.
10. In GSM system 25 MHz is used for forward link. which is broken into radio channels of 200 KHz. If 8 speech channels are supported on a single radio channel, find the number of simultaneous users. Assume no guard band.

PART B — (5 × 16 = 80 marks)

11. (a) Discuss in detail the evolution of mobile radio system and how a cellular telephone call is set up.

Or

- (b) Explain various types of mobile wireless services and future trends in personal wireless systems.

12. (a) (i) What is frequency Re-use? How does it improve the system capacity? (6)
(ii) Discuss the handoff strategies used in cellular mobile systems. (10)

Or

- (b) A city has an area of 1300 square miles and is covered by a cellular system using seven cell reuse pattern. Each cell has a radius of four miles and the city is allocated 40 MHz of spectrum with full duplex channel bandwidth of 60 KHz. Given, traffic intensity per cell at 2% GOS is 84 erlangs, and offered traffic per user is 0.03 erlangs, compute

- (i) The number of cells in the service area
(ii) The number of channels per cell
(iii) The maximum carried traffic
(iv) The total number of users
(v) The number of mobiles per unique channel
(vi) The theoretical maximum number of users that could be served at one time by the system.
13. (a) Explain the two-ray ground reflection model and obtain an expression for the received power at a distance 'd' from the transmitter. (16)

Or

- (b) Describe the impulse response model for a multipath radio channel. (16)

14. (a) With a neat diagram, explain the performance of the rake receiver.

Or

- (b) Describe the concepts of speech coding and explain how it is made effective in signal processing.

15. (a) With a suitable block diagram, explain the general architecture of GSM system.

Or

- (b) Write detailed notes on : MSK and GMSK.