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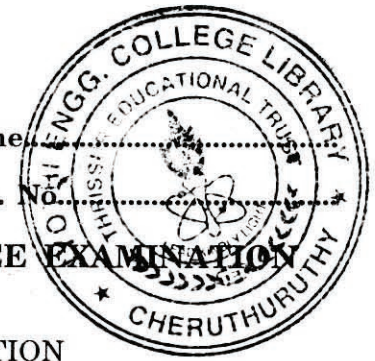
EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION APRIL 2013

EC 09 802—WIRELESS MOBILE COMMUNICATION

(2009 Admissions)

Time : Three Hours

Maximum : 70 Marks

Part A

*Answer **all** questions.*

1. Why Hexagonal cell geometries are always preferred ? Explain.

2. What is trunking in cellular radio systems ?

3. Find the far field distance for an antenna with maximum dimension of 1 m and operating frequency of 900 MHz.

4. If a cellular operator is allocated 12.5 MHz for each simplex band and if the total spectrum allocation, the guard band allocation and channel bandwidth are 12.5 MHz, 10 kHz and 30 kHz respectively, find the number of channels in an FDMA system.

5. What is the cut-off frequency of the baseband, Gaussian, pulse-shaping filter used in the GSM system ?

(5 × 2 = 10 marks)

Part B

6. If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses :

    (a) Four cell reuse.

    (b) Seven cell reuse.

    If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems.

7. Explain the three propagation mechanisms which impact propagation in a mobile communication system.

8. Explain TDMA.

9. Briefly discuss about IMT–2000.

(4 × 5 = 20 marks)

Turn over

Part C

10. (a) (i) Explain in detail about Handoff and its types.

    (ii) Explain the channel assignment strategies.

Or

    (b) Explain the cellular system capacity improvement through Cell Splitting and Sectoring.

11. (a) Explain the two ray ground reflection model.

Or

    (b) (i) With block diagram, explain RAKE receiver.

    (ii) Explain the various diversity schemes.

12. (a) Explain the concept of CDMA and derive an expression for its capacity.

Or

    (b) (i) Discuss in detail about the spread spectrum techniques.

    (ii) Explain FDMA.

13. (a) Discuss in detail about the GSM architecture.

Or

    (b) Explain the serving frequency bands and objectives of GSM.

(4 × 10 = 40 marks)