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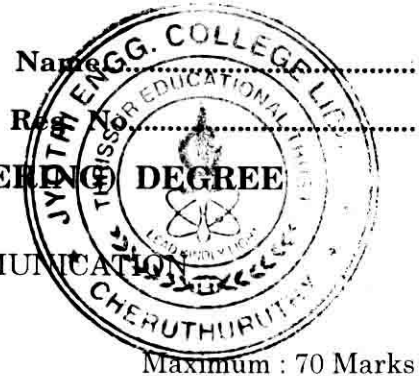Name.................................

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EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, APRIL 2014

EC/PTEC 09 802—WIRELESS MOBILE COMMUNICATION

(2009 Scheme)

Time : Three Hours

Maximum : 70 Marks

Part A

Answer **all** *questions.*

1. What is frequency reuse ? Give its advantages.

2. Define trunking efficiency.

3. Define Brewster Angle.

4. Define Processing Gain.

5. What is the spectral efficiency of the GMSK modulation scheme used in GSM ?

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*

6. With block diagram explain the Macrocell concept .

7. Derive the impulse response model of a Multipath Channel.

8. If an AMPS cellular operator is allocated 12. 5 MHz for each simplex band, and if B_t is 12.5 MHz, B_{guard} is 10 kHz and B_c is 30 kHz, find the number of channels available in a FDMA system. (where B_t is the total spectrum allocation, B_c is the channel Bandwidth and B_{guard} is the guard band allocated at the edge of the allocated spectrum band).

9. With block diagram, explain Rake Receiver.

10. Explain TDMA.

11. Explain IMT-2000 standard.

(4 × 5 = 20 marks)

Part C

12. (a) With timing diagram illustration explain how a call initiated by a mobile is established.

Or

(b) If a signal-to-interference ratio of 15-dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (i) $n = 4$, (ii) n = 3 ? Assume that there are six co-channels cells in the first tier, and all of them are at the same distance from the mobile. Use suitable approximations.

Turn over

13. (a) Explain diversity techniques. Derive an expression for the SNR improvement offered by Selection diversity.

Or

(b) Draw a block diagram of a binary spread spectrum sliding correlator multipath measurement system. Explain how it used to measure power delay profiles.

14. (a) Explain in detail about Frequency Division Multiple Access (FDMA)

Or

(b) Discuss in detail about CDMA.

15. (a) (i) Explain the services and features of UMTS.

    (ii) Compare the number of omnidirectional cells required to cover a 1000 sq. km area using GSM at 800 MHz and DCS-1900 at 1900 MHz. Assume the sensitivity of both the GSM and the DCS-1900 receivers equal-104 dBm. Assume equal transmitter power and antenna gain for the two systems.

Or

(b) Explain the various Traffic Channels and Control channels of GSM.

(4 × 10 = 40 marks)