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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Eighth Semester, B.E. - Information Science and Engineering

Semester End Examination; June/July - 2015

Wireless Technology

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer any **FIVE** full questions, selecting at least **TWO** full questions from each part.*

PART - A

1. a. List out and explain AMPS ongoing idle mode tasks? Explain AMPS Network operation and handover operation with neat figure? 12

   b. Write a note on:

   i) Base Station Controller

   ii) Transcoder controller 8

   iii) VLC and HLC

   iv) LAI and IMEI

2. a. How is cell splitting different from cell sectoring? Explain. 5

   b. Discuss the process of power control used by cellular system. 5

   c. When does the location updating function occur? Explain. 5

   d. Explain two basic operations occur during the handoff process. 5

3. a. Explain IMSI detach/attach location updating in GSM. 5

   b. Write a note on Radio resource connection establishment in GSM system. 5

   c. Explain layer 3 and layer 2 operations in GSM infrastructure communications. 10

4. a. Explain basic spectrum spreading operation in CDMA technology. 6

   b. List out different CDMA system operations. Explain any two. 10

   c. Explain IS – 95 B 3G CDMA system. 4

PART – B

5. a. What is the received power in dBm for a signal in free space with a transmitting power of 1 W, frequency of 1900 MHz, and distance from the receiver of 1000 m if the transmitting antenna and receiving antennas both use dipole antennas with gain approximately 1.6? What is the path loss in dB? 5

   b. Explain spread spectrum modulation techniques with neat figure. 10

   c. Write a note on RAKE receiver technology. 5

6. a. Explain the MAC frame structure with neat diagram. 8

   b. Explain IEEE 802.11b long PLCP and IEEE 802.11b short PLCP frame structure. 12

Contd...2

7 a. List out the applications of Broadband satellite and Broadband microwave system. 4

b. If the nominal transmitter output power is 120 watts for a Directive DBS and the transmitting antenna gain is 34 dB, Determine the received signal power if the 18 inch receiving dish has a nominal gain of 33 dB. Assume that the operating frequency is 12.45 GHz and the receiving antenna is directly below the satellite. 4

c. A digital microwave link is set up to transmit 24 DS1 using 16 QAM with a 20 MHz bandwidth at 38 GHz. Both the transmitting and receiving antennas have diameters of 30 cm and a nominal gain of 38.5 dB. If the transmitter O/p power is + 16 dBm and the receiver sensitivity is -74 dBm for a bit error rate of 10^{-7}. Determine the maximum system range assuming un obstructed LOS propagation and a 15 – dB link margin. 4

d. Explain the technical challenges for Broadband satellite system. 8

8 a. Why would cognative radio technology be particularly useful in rural areas? List out advantages of cognative radio technology. 6

b. Describe the basic concept of UWB technology and basic concepts of wireless transmission using free space optics. 6

c. Explain push – to – talk technology. List out the characteristics of 4G wireless system. 8

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