Code No: 5155P

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech II Semester Examinations, August-2014
WIRELESS COMMUNICATIONS AND NETWORKS
(Embedded Systems)

Time: 3 Hours Max. Marks: 60

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 8 marks and may have a, b, c as sub questions.

PART - A

5 × 4 marks = 20

1.a) Determine the noise floor (in dBm) for mobile receivers which implement the following standards: (i) AMPS, (ii) GSM, (iii) USDC, (iv) DECT, (v) IS-95, and (vi) CT2. Assume all receivers have a noise figure of 10 dB.

b) Free space propagation: Assume the transmitter power is 1 W at 60 GHz fed into the transmitter antenna. Using the horn antenna (with dimensions of 4.6 cm x 3.5 cm) at both the transmitter and receiver: (i) Calculate the free space path loss at 1 m, 100 m and 100 m, (ii) Calculate the received signal power at these distances, (iii) What is the rms voltage received at the antenna if the receiver antenna has purely real impedance of 50 Ω and is matched to the receiver?

c) Approximately how large can the rms delay spread be in order for a binary modulated signal with a bit rate of 25 kbps to operate without an equalizer? What about an 8-PSK system with a bit rate of 75 kbps?

d) If a digital signal processing chip can perform one billion multiplications per second, determine the time required between each iteration for the following adaptive equalizer algorithms:
i) LMS, ii) Kalman RLS, iii) Square root RLS DFE iv) Gradient lattice DFE

e) What are the disadvantages of wireless local area networks?

PART - B

5 × 8 marks = 40

2. What are the methods used improve the capacity and coverage in cellular systems? Describe any methods in detail.

OR

3. What is frequency reuse? How is it implemented in cellular mobile systems? Derive the equation for frequency reuse factor.

4. What are the outdoor propagation models? Give the differences between Dunkin's and Okumura's models.

OR

5. What are the path loss models? Describe how you would determine the percentage of coverage area.

6. What are the types of small scale fading? Describe the fading effects due to Doppler spread.

OR

7. Describe the simulation of Clark and Gans Fading model.

8. Explain the use of FOR loop giving examples for fixed and variable number of iterations. [8]

OR

9. Explain instruction scheduling in ARM using suitable examples. [8]

10. Explain the four-way Set associative cache organization using a neat diagram. [8]

OR

11. Explain the memory organization in a virtual memory system. [8]

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