Code : 041880

B.Tech. 8th Semester Exam., 2017

Mobile Computing

Time : 3 hours   *Full Marks : 70*

Instructions :

    (i)   *The marks are indicated in the right-hand margin.*

    (ii)   *There are **Nine** questions in this paper.*

    (iii)   *Attempt **Five** questions in all.*

    (iv)   *Questions No. 1 is compulsory.*

1. Answer any SEVEN   2×7

    i.   List the advantages of third generation (3G) networks.

    ii.   What are the basic units of a Cellular system?

    iii.   What is coherence bandwidth?

    iv.   Define Diversity.

    v.   What are the major issues in WLAN?

    vi.   Mention the three partially separable effects of radio propagation.

    vii.   State the expression used to locate co channel cells.

    viii.   What is channel assignment? Mention the different types of channel assignment?

    ix.   What is the significance of propagation model?

    x.   Define dwell time.

2. (a) Discuss the evolution of modern wireless communication system from 2G to 4G networks?

(b) Prove that for a hexagonal geometry, the co-channel reuse ratio is given by $Q=\sqrt{3N}$, where $N = i^2 + ij + j^2$.   8+6

3. (a) Explain the Free Space Propagation model. How the received signal strength is calculated using the free space propagation model?

(b) Describe the factors that influence small scale fading.   8+6

4. (a) A certain city has an area of 1300 square miles and is covered by a cellular system using a seven cell reuse pattern. Each cell has a radius of 4 miles and the city has 40 MHz spectrum with a full duplex channel bandwidth of 60 KHz. Find:

i. The number of cells in the service area.

ii. The number of channels per cell

iii. Total number of subscribers than can be served.

(b) Explain the concept of orthogonal frequency division multiplexing with the help of diagram.   6+8

5. (a) What is a spread spectrum technique and why it is used? *Compare and contrast the techniques of DHSS and FHSS.*

(b) Illustrate the working of a Rake Receiver with the help of a labelled diagram.   7+7

6. (a) Explain the concept of frequency reuse in cellular systems. Show that the frequency reuse factor for a cellular system is given by k/S, where k is the average number of channels per cell and S is the total number of channels available to the cellular service provider.

(b) What is the purpose of handoff operation in cellular system ? Discuss the different handoff strategies employed by the GSM system.   7+7

7. Discuss the strategies for improving the capacity of the cellular systems.   14

8. (a) What are the challenges of wireless communications?

(b) Illustrate the networking architecture of GPRS with the help of a diagram.   7+7

9. Write short notes on the following: 14

(a) Polarization Diversity

(b) CDMA

(c) Bluetooth

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