B.Tech Even Semester Examination, May, 2025

Computer Science & Engineering

(8th Semester)

Course No: CSE-803 (8)

(Mobile Computing)

Full Marks: 50
Pass Marks: 15
Time: 2 hours

Note:

1. Attempt any five questions.
2. Begin each answer in a new page
3. Answer parts of a question at a place
4. Assume reasonable data wherever required
5. The figure in the right margin indicates full marks for the question
6. All the mathematical symbols and abbreviations have their usual meanings.

1. (a) What is mean by handoff? What are the main reasons for handoff in cellular networks? Explain the types of handoffs in GSM . (5)

   (b) In a cellular system with a 7-cell cluster, 168 voice channels are available. Determine the assignment of voice channels to each cell/sector if

   (i) Omnidirectional antennas are used at the cell-site

   (ii) 3-sector 120-degree directional antennas are used at the cell site.

   (iii) 6-sector 60- degree directional antennas are used at the cell-site

   Comment on the results obtained. (5)

(b) Briefly explain why traditional packet routing protocol for wired network cannot be used straightaway in a MANET. (2)

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2. (a) Discuss the count to infinity problem in distance vector routing algorithm. Explain with proper example how DSDV routingalgorithm overcome such problem. (2+5)

(b) Why the traditional IP cannot be used in a mobile network? What are the main differences between the traditional IP and the mobile IP? What could be quick solutions to Mobile IP, and why they don't work? (3)

3. (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 60KHz. Find:

(i) The number of cells in the service area.

(ii) The number of channels per cell. (3)

(b) What do you mean by agent solicitation? Why are agent advertisement messages needed? (3)

(c) What is the primary goal of the routing protocol of an ad-hoc network? Explain the classification of routing protocols in MANET with an example of each of them. (4)

4. (a) Explain the hierarchical schemeof location management. Give some advantages of hierarchical scheme over the HLR-VLR scheme. (3+2)

(b) Explain the hidden terminal and exposed terminal problems and also explain the solution to solve it. (3+2)

5. (a) Describe about tunneling and encapsulation in Mobile IP with proper diagram. (5)

(b) Explain about Mobile TCP and Snooping TCP and write down their advantages and disadvantages. (5)

6 (a) Explain GSM architecture with a neat diagram. (5)

(b) Suppose, the loss in free space propagation is usually defined in decibels per kilometer (dB/km). If the received signal at the first point with "0.3 dB/km loss has a power of 2 mW, what is the received signal power at 5 km (second point)? (2)

(c) The radius of the split cell is one-half of that of the original cell (before splitting). Show that the overall system capacity increases by four times. (3)

7 (a) Write short notes on satellite communication system. Also mention the advantages of satellite communication as compared to traditional conventional communication system. (2+2)

(b) Explain in brief GEO and LEO with the advantages and disadvantages of (9) each (3)

(c) What is the problem of fluctuations in the DSDV protocol? How to overcome this problem? (3)

8 (a) Explain Dynamic source routing protocol of MANET? What is meant by route caching and give the disadvantages of DSR protocol? (5+2)