

2018

**MOBILE COMPUTING**

Paper : IT 815

Full Marks : 100

Time : Three hours

***The figures in the margin indicate full marks for the questions.***

***Answer any five questions.***

1. (i) Why Hexagonal cell shape is perfect over square or triangular cell shapes in cellular architecture? How do you show that, reuse factor,  $K$  in a hexagonal cellular system is  $i^2 + j^2 + ij$ , where  $i, j$  represents the coordinate of the base station in the cellular system?  
3+7=10

- (b) "CSMA/CD protocol is not appropriate for mobile networking", comment on it.

5

Contd.

(c) Determine the number of channels/cluster and the total channel capacity for a cellular telephone area comprised of 10 clusters with 7 cells in each cluster and 10 channels in each cell.

5

2. (a) What do you understand by coverage and capacity in cellular systems? Explain various possible techniques to improve coverage and capacity in cellular systems.

4+6=10

(b) Differentiate the following (*any two*):

(i) Piconet and Scatternet

(ii) WAP and a portal

(iii) Soft and Hard Handover.

5+5=10

3. (a) Apart from dropping packets due to handover or higher bit error rates, the occurrence of lengthy or frequent disconnection is also a problem in mobile network. Explain how mobile TCP protocol overcomes this problem. Also list main advantages and disadvantages of this solution.

6+4=10

(b) What do you mean by proactive and reactive protocols? Explain the DSR and AODV routing protocols in MANET.

4+6=10

4. (a) What is Bluetooth? Also describe the general format of packet and packet header in Bluetooth technology.

2+8=10

(b) Explain the Snooping TCP. What are its advantages and disadvantages?

3+4=7

(c) Define Dwell time.

3

5. (a) Explain how sectoring and cell splitting concept improves the coverage and capacity in cellular systems.

8

(b) Explain Queuing concept in hand off. What are the advantages of delayed hand off?

4+2=6

(c) What do you mean by Co-channel interference and Adjacent channel interference?

6

6. (a) Describe the system architecture and protocol architecture of IEEE 802.11 with suitable examples.

5+5=10

(b) If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses 50 KHz of channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses :

- (i) 4 cell reuses (ii) 7 cell reuses,  
If 1 MHz of the allocation spectrum is dedicated to a control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems.  
5+5=10

7. (a) What is the main purpose of Wireless Transaction Protocol (WTP)? Explain various classes of transaction services provided with the help of suitable diagram, also explain the working of the WTP class 2 services.  
3+7=10

(b) Differentiate the following effects:  
5+5=10

- (i) Hidden and exposed terminal  
(ii) Near and far terminal.

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