B.E. / B.Tech. (FULL TIME) DEGREE END SEMESTER EXAMINATIONS
APR/MAY 2012
(Information Technology Branch)
SIXTH SEMESTER
IT9352- WIRELESS NETWORKS

(Regulations 2008)

Time : 3hr Max Mark : 100

Answer all the questions

Part A (2 × 10 = 20 Marks)

1. Give two advantages and disadvantages of reducing cell size.
2. What do you mean by training sequence? How is it helpful in wireless transmission?
3. Define MSISDN, MSRN, TMSI, and IMSI.
4. What is meant by DIFS, SIFS and PIFS? Why do we need these different time gaps?
5. Give the sender, receiver and the purpose of the following channels: BCCH, PCH, DCCH and FACCH.
6. Give the difference between a) handover and roaming, b) Soft handover and hard handover.
7. What are the advantages of M-TCP?
8. What are the two types of destination addresses that can be assigned to mobile node? How are they registered?
9. Write the features of WML.
10. Give the procedure for using WDP protocol for datagram transport service.

Part B (5 × 16 = 80 Marks)

11. (i) A cellular system has a total of 33 MHz of bandwidth and uses two 25 KHz simplex channels to provide full duplex voice and control channels. What is the number of channels available per cell for a frequency reuse factor of (i) 4 cells, (ii) 7 cells and (iii) 12 cells? (8)

(ii) Assume a system of 32 cells and is supported by a total of 336 channels. Using a reuse factor of 7,

a. Find out the total no. of channels supported by each cell and total system (2)
b. Repeat the same for the reuse factor of 12. (2)
c. Repeat (i) and (ii) for 128 cells. (4)

12. a. (i) In the FHSS technique, 3 bit PN sequence is generated in the following sequence 000, 010, 110, 111. The following input binary stream is sent as 2 bits at a time: 01 01 11 11 00 10 11 10. Show the frequency during each hop, where frequency changes after every 4 bit duration of data. (8)

(ii) In 802.11 adhoc networks, power is managed by changing the mode of each station to sleep mode and awake by providing ATIM window and beacon interval. Explain, with transition diagram, how the three stations are synchronized among themselves and exchange data between them. Assume that Station 1 sends data to station 2 during 4^{th} beacon interval and station 2 transfers data to station 1 during 1^{st} beacon interval. Also assume that only station 1 is sending beacon frame after random delay. (8)

Or

12. b. Explain in detail with time transition diagram, the total time taken to complete all the following transactions using DFWAC-PCF and DCF.

First, PCF starts at time t = 10ms. During this time, Station 1 has data to be sent to Station 3, but Station 2 and 3 do not have anything to send. Show the situation using PCF. Afterwards, DCF started. During this time, Station 1 wants to send data to Station 2 at time t = PCF time + 10 ms and Station 3 wants to send data to Station 2 at time t = PCF time + 15 ms. Assume SIFS = 3 ms and one slot time = 1ms. (16)

13. a. Illustrate with typical examples explain the sequence of operations by showing the original values and updated values in all the tables with respect to

(i) Change of MS from the BTS to other BTS in same BSC
(ii) Change of MS from the BTS to other BTS with different BSC
(iii) Change of MS from its home network in Chennai to some other service provider in Mumbai.

In case (iii) explain how communication is taking place while you are talking to a person whose service provider is from Mumbai. (16)

Or

13. b. (i) Explain with a neat diagram, how data communication is taking place in GPRS System. (12)

(ii) Briefly discuss the A5 algorithm for encryption in order to provide security services to GSM. (4)

14. a. A mobile node MN 210.6.5.4 is moved from its home network to a foreign network 200.199.199.0. A correspondent node CN with 199.199.199.199 is sending a packet to 210.6.5.4.

(i) Show the agent discovery, advertisement, tunneling and encapsulation, mobility binding with diagram. (8)

(ii) If the MN moves to 199.199.199.0 , show the correspondence between CN and MN and also the optimization with neat diagram. (8)

Or

14. b. There are 8 nodes from A to H forming an adhoc network. Using DSDV and DSR, explain how path is established to communicate from C to H. Show the routing table in each node. When a node E fails, show the effect of breaking the link and find the alternate path from B to G transmission. (16)

15. a. (i) Illustrate by providing IP address, MAC address and port numbers, how packets are transmitted in snooping TCP. Assume that 10 packets need to be transmitted and packets 3, 5 and 7 will be re-transmitted from foreign agent. In addition, packet 5 also will be retransmitted from CN to MN. Show the transactions that take place in all situations. (12)

(ii) In the above scenario, when the MN moves to another network after receiving 8^{th} packet, show the sequence of actions to receive 9^{th} and 10^{th} packet from CN. (4)

Or

15. b. With a neat sketch, give the architecture of WAP and explain the functions of protocols used in each layer. (16)
