CE1.5-R4: MOBILE COMPUTING

«QP_SRLNO»

NOTE:

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours **Total Marks: 100**

1.

a) Briefly describe the following terms with respect to the Internet Protocol (IP)?
   i) IP address
   ii) IP header
   iii) IP node
   iv) IP packet

b) Explain XHTML and its features.

c) Can the problems using TCP for mobile communication, be solved by replacing TCP with snooping TCP? Justify your answer.

d) Describe the transaction models in Mobile Database.

e) What are general problems of mobile IP regarding security? Name the inefficiencies of mobile IP regarding data forwarding from a correspondent node to a mobile node. What are optimizations and additional problems do they cause?

f) What are the limitations of a GSM cell in terms of diameter and capacity (voice, data) for the traditional GSM? In GSM, each 200 KHz channel is subdivided into frames that are repeated continuously. The duration of the frame is 4.615 ms that is further divided into 8 time slots. In each time slot a user can send 156.25 bit. What is the data-rate for each user?

g) List the different user scenarios for wireless piconets. How a Scatternet is associated with a piconet?

(7x4)

2.

a) Describe the problems when CSMA/CD is applied to wireless networks. Describe how CSMA/CA solve the above problems.

b) What is a good code for CDMA? Consider a sender A wants to send the data bit 1 with key = 100101 and a sender B wants to send the data bit 0 with key = 010110. Assume we code a binary 0 as -1, a binary 1 as +1. Both signals are transmitted at the same time.
   The noise to the transmitted signal is (0, +1, -1, 0, 0, -1).
   i) What signal is received by a receiver?
   ii) What can the receiver detect for sender A and B respectively?

c) Where and when can collisions occur while accessing the GSM system?

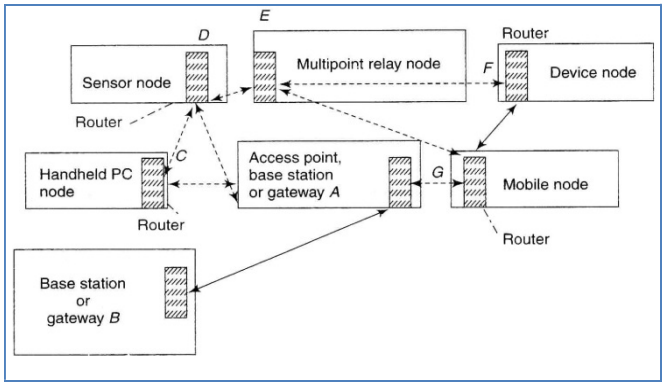
(6+8+4)

3.

a) Describe Dynamic Source Routing Protocol (DSRP) along with its two phases. Explain RREQ packets (with respect to Phase 1 of DSR protocol).

b) Explain the protocol used for finding a co-located care-of address. When in the DHCP used? Explain the DHCP protocol. How does a DHCP server bind a mobile node with an IP address?

c) From the below figure, consider the MANET. Assume that node D is a source and G is a destination and the path D-E-F-G is not known. In such a case the path cannot be placed in the header. Explain the route discovery process using an RREQ from a node D in the network.



(6+8+4)

4.

a) Describe transaction oriented TCP with diagram. How does the integration of connection establishment, data transfer and closed functions into one help in transmitting and receiving at the TCP nodes?

b) Describe the explicit notification schemes. What are the changes required at the receiver and the transmitter to enable explicit notifications?

c) Assume that a segment of 4020 bytes has the sequence numbers 1025-5044. Assume that w is set to 1000 B in the data stream received from other end, because the receiver data link layer has MTU (maximum transferable units = 1000 B). How does the TCP_A layer transmit?

(8+6+4)

5.

a) Describe service discovery mechanisms used in Jini and UPnp.

b) Compare the use of unicasting, multicasting and advertising in service discovery.

(9+9)

6.

a) How a handheld computer is different from a PC? State the main points of difference between a computer and a Smartphone.

b) Describe the features of a latest Palm OS device. How do these differ from those of Windows CE devices?

(9+9)

7. Write short notes on the following:

a) Cache invalidation mechanisms. Explain the advantages and disadvantages of Stateless and Stateful cache invalidation. Explain the advantages and disadvantages of asynchronous and synchronous cache invalidation.

b) Explain WAP Architecture and its protocol stack with a suitable diagram.

(9+9)