Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –IIst SEMESTER–EXAMINATION – JULY- 2012

Subject code: 725305 **Date: 12/07/2012**

Subject Name: Mobile Communication Technologies

Time: 10:30 am – 13:00 pm **Total Marks: 70**

Instructions:

1. **Attempt question 1, which is compulsory and answer any five from the rest questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q. No. 1 [2 Marks X 10 = 20 Marks]

a. Comment on whether a data link protocol such as IEEE 802.11 can assist TCP in remaining effective in mobile and wireless networks?
b. What is the reaction of standard TCP in case of packet loss?
c. All wireless systems are not necessarily mobile and vice versa. Name one example of a wireless system that is not mobile and one mobile system that is not wireless?
d. In a mobile GSM network, what is the function of the Home Location Register (HLR) and Visitor Location Register (VLR)?
e. A person who lives in New Delhi travels to Agra taking her portable computer with her. She finds that the LAN at her office in Agra is a wireless IP LAN, so she does not have to plug in. Is it still necessary to go through the whole business with home agents and foreign agents to make e-mail and other traffic arrive correctly?
f. Briefly tell by an example the use of "Proxy ARP" when home agent intercepts the packet destined for mobile host?
g. Write short note on GSM's achievements?
h. Write short note on I-TCP?
i. List the entities of mobile IP?
j. Write short note on node mobility?

Q. No. 2

Consider two variants of TCP for mobile networks, I-TCP and Snooping TCP. One of these variants preserves reliable end-to-end semantics, the other does not. Which variant preserves end-to-end semantics? Provide an example scenario which demonstrates that one variant does not preserve end-to-end semantics, and the other does. When giving the example, please list the entities involved and the packets exchanged? [10Marks]

Q. No. 3

a. Describe the problems when CSMA/CD is applied to wireless networks. What method could solve the problems? Describe how it works? [6 Marks]
b. Show the interaction of mobile IP with standard TCP? [4 Marks]

Q. No. 4

Once the receiver side has advertised the window size of zero, the sender is not permitted to send anymore data, which means it has no way to discover that the advertised window is no longer 0 at some time in future. How does TCP deals with this? Further, how this particular feature can be utilized in mobile scenarios? [10 Marks]

Q. No. 5

The mobility agent (foreign or home) generally increments the sequence number by one for each successive transmission. What is the use of this sequence number in agent advertisement? How can we distinguish between foreign agent crashes and wraparound of the sequence number field? [10 Marks]

Q. No. 6

Suggest a design to provide mobility support using private IP addresses and NAT. This is an open ended question; credits would be awarded on following issues:

- Clarity of idea
- Implementation easiness
- Mobility transparency
- Less overhead and complexity [10 Marks]

Q. No. 7

Show the interaction of mobile IP with standard TCP. Draw the packet flow from fixed host to a mobile host via a foreign agent, then a handover takes place. What are the following actions of mobile IP and how does TCP react? [10 Marks]

Q. No. 8

Suppose nodes A, B, and C each attach to the same broadcast LAN (through their adapters). If A sends thousands of IP datagram to B with each encapsulating frame addressed to the MAC address of B, will C's adapter process these frames? If so, will C's adapter pass the IP datagrams in these frames to the network layer in C? How would your answer change if A sends frames with the MAC broadcast address? [10 Marks]

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