<table>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

**B.E/B.TECH DEGREE END SEMESTER EXAMINATIONS, APRIL/MAY 2013**

**INFORMATION TECHNOLOGY**

**SIXTH SEMESTER – REGULATION 2008**

**IT 9352 WIRELESS NETWORKS**

Time: 3 hrs                                                                 Max.Marks:100

**Answer All Questions**

**Part – A (10X2 = 20 Marks)**

1. What is the problem in choosing a square to represent a cell in cellular networks?
2. What is the reason for the ping pong effect during handoff in cellular networks?
3. Write short notes on distributed system (DS) of IEEE 802.11 wireless LAN.
4. What happens to the beacon interval and the timestamp of the beacon in the case of busy channel during synchronization in a wireless LAN?
5. When is it necessary to perform intra-cellular handover in GSM networks?
6. Mention the information present in the SIM card of a GSM network.
7. Assume that the size of a RREQ packet is 192 bytes and the amount of data to be sent from source to destination is 200 bytes. Is it better to go for flooding or for a formal routing protocol? Justify your answer.
8. List down the limitations of traditional TCP in the context of wireless networks.
9. We decide to go for a hybrid routing protocol in a MANET. With reference to node X where we will go for proactive protocol and where we will go for reactive protocol?
10. State the reasons why HTTP is not a suitable application layer protocol in mobile computing.

**Part – B (5X16 = 80 Marks)**

11. i. Discuss the motivation for a specialized MAC in wireless networks.     (8)
    ii. Explain the orthogonal codes and autocorrelation of orthogonal codes in CDMA.                                                                       (8)

12a. i. Complete Table 1 with respect to the infrastructure mode operation of IEEE 802.11 wireless LANs and discuss the four possible scenarios.                                                                       (8)

## Table 1

| To DS | From DS | Address 1 | Address 2 | Address 3 | Address 4 |
|-------|---------|-----------|-----------|-----------|-----------|
| 0 | 0 | | | | |
| 0 | 1 | | | | |
| 1 | 0 | | | | |
| 1 | 1 | | | | |

ii. Explain the DFWMAC-DCF with RTS/CTS extension with a neat diagram.
(8)

(OR)

12b. i. Consider two contention windows with $CW_{min} = 7$ and $CW_{max} = 255$ and $CW_{min} = 15$ and $CW_{max} = 1023$. What are the various possible values the two windows can take? Compare the performance of these two windows under light load and heavy load wireless LAN scenarios. (8)

ii. Explain the power saving and wakeup patterns in the infrastructure mode of IEEE 802.11 wireless LANs. (8)

13a. i. Explain the protocol architecture for signaling in GSM networks. (8)

ii. Explain the functions of radio subsystem and network subsystem of GSM networks. (8)

(OR)

13b. i. Discuss the functions of gateway GPRS support node and serving GPRS support node in detail. (8)

ii. Discuss the components and functions of UMTS Terrestrial Radio Access Network. (8)

14a. i. Consider the scenario as shown in Figure 1.



Mobile Node A

Home Network for A

Home Agent

(2)

Internet or other topology or router and links
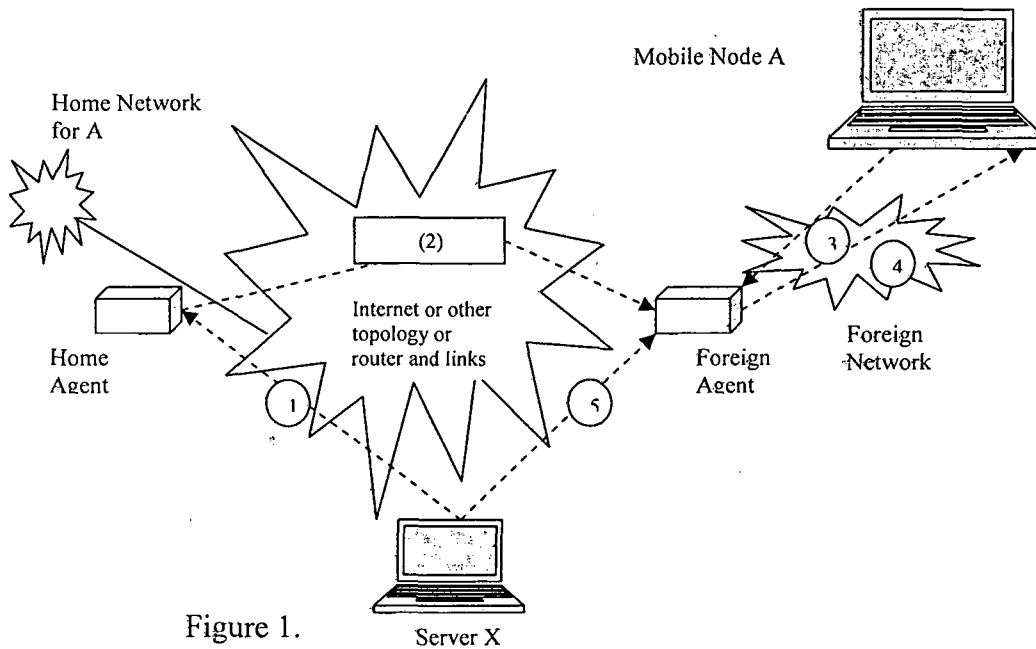
Foreign Agent

Foreign Network

Server X

Figure 1.

List down the activities involved in the transmission of data from server X to mobile node A. (8)

ii. Mention and explain the purpose of three fields that differ between inner IP header and outer IP header in IP within IP encapsulation of mobile IP. (8)

(OR)

14b. i. Explain how the end to end semantics is maintained in Snoop TCP and violated in Indirect TCP. (8)

ii. Assume a fixed internet connection with an RTT of 20 ms and BER of $10^{-10}$. Calculate the upper bound on TCP's bandwidth for a MSS of 1000 bytes. Now two different wireless access networks are added. A WLAN with 2ms additional one way delay and BER of $10^{-3}$ and a GPRS network with an additional RTT of 2s and BER of $10^{-7}$. Redo the calculation ignoring the fixed network's error rate. (8)

15a. i. Discuss the Wireless Application Environment in terms of origin server, gateway and client. (8)

ii. Explain the role of WML and WMLScript in WAP. (8)

(OR)

15b. i. Explain how the route from Source S to Destination D is discovered in DSR routing protocol in a MANET with a sample topology. (8)

ii. Discuss attach and detach procedures of the GPRS network. (8)

------------*----------*--------------