Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.TECH(IT)/SEM-8/IT-802D/2010
2010
MOBILE COMMUNICATION

Time Allotted : 3 Hours   Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

                                        10 × 1 = 10

i) CDMA is applied in

   a) physical layer   b) network layer

   c) MAC layer   d) transport layer.

ii) Handoff effects in

   a) call dropping

   b) temporary disconnection

   c) call termination

   d) may be all.

iii) Mobile IP refers

   a) mobility   b) IP tunneling

   c) IP within IP   d) all of these.

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iv) Dynamic source routing is

    a) ad-hoc routing   b) proactive process

    c) on demand routing   d) both (a) and (c).

v) Bluetooth is

    a) wireless LAN

    b) WAN

    c) short range Infrared Ad-hoc

    d) short range wrieless Ad-hoc LAN service.

vi) A member of piconet

    a) should not be a member of other piconet

    b) may be a member of other piconet

    c) may be slave & master of other piconet

    d) both (b) and (c).

vii) The profile synchronization in bluetooth is achived by

    a) OBEX   b) TCS BIN

    c) AT Commands   d) PPP.

viii) WML script

    a) is used wireless application protocol

    b) is like Java script

    c) is used in normal internet browser

    d) both (a) and (b).

ix) GPRS technology is a

    a) general packed radio service used in PC

    b) service used in 3G mobile

    c) mobile internet service used in 3G mobile

    d) all of these.

x) Slow start and fast retransmit is related to

    a) transport layer   b) data link layer

    c) network layer   d) all of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.   3 × 5 = 15

2. State and explain WAP architecture design principles.

3. Describe the protocols of a GPRS system.

4. Explain the WML document modes with examples.

5. What are the main reasons for using cellular system ? Describe the dynamic channel allocation in cellular system.

                                                              2 + 3

6. Describe the system architecture and protocol architecture of IEE 802.11 with suitable diagram.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following.   3 × 15 = 45

7. a) What are the services provided in a GSM system ?   4

   b) Explain how a mobile station connects to and talks with another mobile station.   5

   c) How will in-between interfaces differ when a mobile station connects to a PSTN destination ?   6

8. a) In what situations can collisions occur in IEEE 802.11, HiperLAN2 and Bluetooth networks ?   3

   b) Distinguish between collisions on PHY and MAC layer. 4

   c) How do the three wireless networks try to solve the collisions or minimize the probability of collisions ?   5

   d) If Bluetooth is a commercial success, what are remaining reasons for the use of infrared transmission for WLANs ?   3

9. a) What is the difference between the care-of address and the co-located care-of address ?   3

   b) What do you mean by reverse tunneling and bi-directional tunneling ?   3

c) How does a reverse tunnel differ from a forward tunnel in the mobile IP protocol ? **4**

d) How does the reverse tunnel help when the time-to-live for the packets at a foreign agent is small ? **5**

10. a) What are the functions of snooping sub layer in the snooping TCP protocol ? **3**

b) Why is the presumption that congestion is the major factor limiting the data flow not valid for mobile and wireless networks ? **4**

c) What are the differences in data flow control in mobile and fixed-line networks ? **4**

d) List the deficiencies in conventional TCP on fixed-line networks that warrant modifications for the mobile networks connected to the internet. **4**

11. a) Why reverse link presents most difficulty in cellular systems ? **3**

b) Prove that for a hexagonal geometry, the co-channel reuse ratio is igven by $Q = \sqrt{(3n)}$, where $N = i^2 + ij + j^2$. **4**

c) Show that the frequency reuse factor for a cellular system is given by k/s, where k is the average number of channels per cell and S is the total number of channels available to the cellular service Provider. **4**

d) If a signal-to-interference ratio of dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (x) $n = 4$, (b) $n = 3$? Assume that there are six co-channel cells in the first tier and all of them are at the same distance from the mobile. Use suitable approximations. **4**