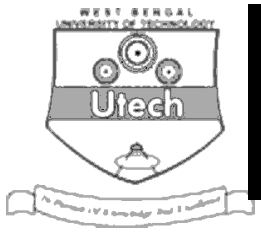
MOBILE COMPUTING (SEMESTER - 8)

CS/B.Tech(CSE)/SEM-8/CS-802A/09



1. .....
Signature of Invigilator

2. .....
Signature of the Officer-in-Charge

Reg. No.

Roll No. of the Candidate

CS/B.Tech(CSE)/SEM-8/CS-802A/09

ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009

MOBILE COMPUTING (SEMESTER - 8)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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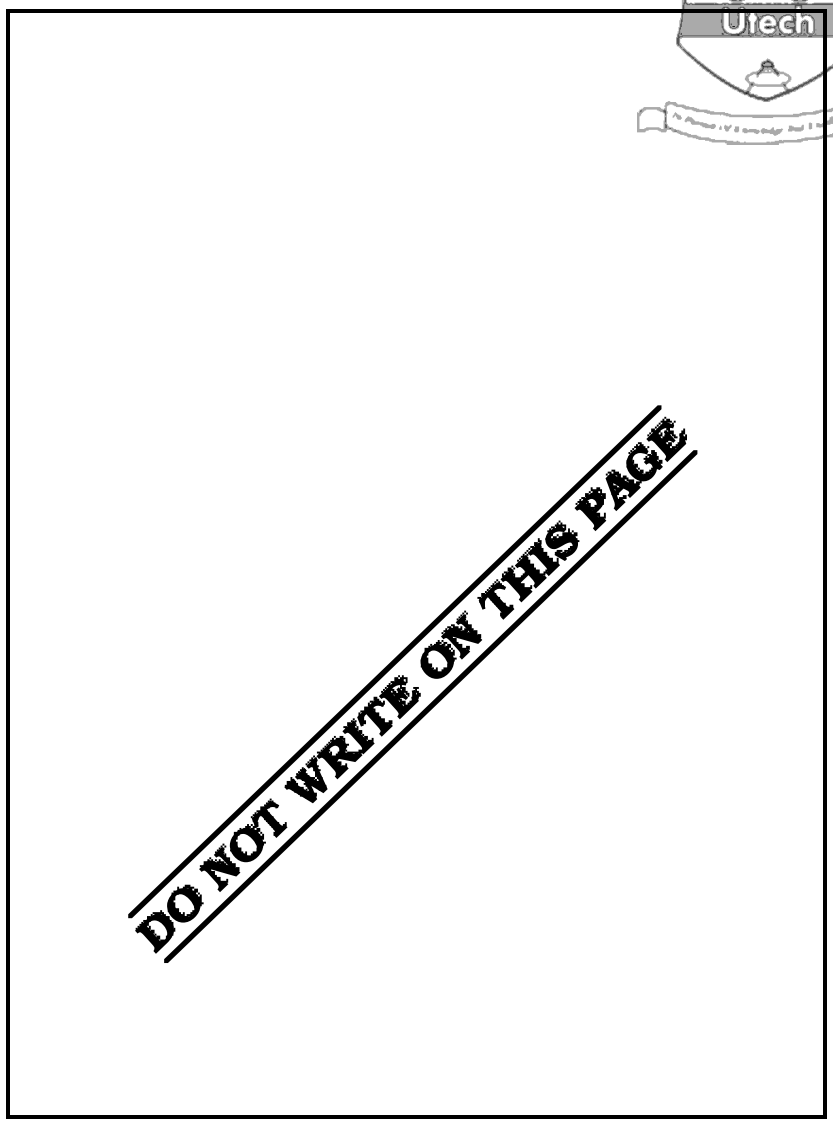
FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B			Group – C				
Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

.....
Head-Examiner/Co-Ordinator/Scrutineer

8876 A/F (27/04)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MOBILE COMPUTING

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

   i) Mobile computing differs from other forms of distributed computing by limitations

      a) battery, memory resources, long distance bandwidth constraints and network and interoperability issues

      b) use of radio-frequency cellular communication

      c) use of radio frequencies in 100-2000 of MHz

      d) inaccessibility of web pages.

   ii) GSM mobile stations and transceivers transmit and receive

      a) full-duplex or half-duplex synchronous, asynchronous or synchronous packet data by circuit switching

      b) full-duplex or half-duplex synchronous or asynchronous circuit-switched data

      c) full-duplex synchronous, asynchronous or synchronous circuit-switched data

      d) Full or half-duplex synchronous voice-data and synchronous packet SMS data.

iii) A GSM service visiting location register registers information of the currently associated mobile stations

a) the information is about their TMSI, IMSI and MSISDN

b) the information is about their HLR and IMSI

c) the information is about their HLR, IMSI and MSISDN

d) the information is about their HLR and TMSI. ☐

iv) Bluetooth provides

a) connectionless-oriented communication

b) peer-to-peer slave communication within same Pico net with negligible interference between Pico nets as each uses distinct channel-frequency hopping sequences

c) Ad-hoc network peer-to-peer communication when two devices are on two different Pico nets Specifying a scatter net

d) Wireless LAN connectivity. ☐

v) CDMA systems exhibit soft handover due to

a) autocorrelation codes used in each cell transceiver

b) each cell using same spread frequency spectrum

c) negligible narrow band interference and co-channel interference of the signal

d) Each cell having a distinct pseudo-noise code offset, so that the handover to the adjacent cell is simply by adding the offset to the mobile terminal pseudo-noise code. ☐

vi) Modulation of a modulating signal with a very large carrier frequency in wireless transmission is necessary due to

a) antenna requirements, signal propagating medium properties and need to multiplex the multiple channels and users at the transmitter

b) smaller antenna size at high frequencies

c) little bending of the beams at high frequencies

d) mobility requirements. ☐

vii) A Cell has

a) one base station which interconnects to mobile devices

b) one base station which interconnects to mobile devices and performs handover to the neighbouring base station and uses a frequency band which is distinct from the neighbouring cell

c) one base station and one access point which connects to mobile devices

d) one base station which interconnects to mobile devices and performs handover to the neighbouring base station and uses a frequency band which is same as the neighbouring cell to ensure mobility of the device in another cell. ☐

viii) I. It is energy efficient to use a single code and multiplexing of signals in time-space.

II. It is energy efficient to use multiple codes of short length and multiplexing of signals in code-space.

Of these :

a) II is true b) II is true in WCDMA only

c) I is true d) I is true for CDMA 2000 only. ☐

ix) Window CE

a) applications are developed by coding for the interrupt service threads.

b) supports 32 priority level assignments to the threads.

c) provides protection from priority inversion as it provides for priority inheritance mechanism.

d) assumes event handlers as fundamental units of execution and providing access of CPU. ☐

x) A mobile device can at best find 6 mobile devices reaching its vicinity. Let there be FDMA mode of access by a node. Assuming that f_{bw0} is the bandwidth requirement between two neighbours, what bandwidth will be needed when all next hop neighbours communicate in full duplex mode and in same time slots ?

a) f_{bw0} b) $2 \infty f_{bw0}$

c) $6 \infty f_{bw0}$ d) $2 \infty 6 \infty f_{bw0}$. ☐

GROUP – B

(Short Answer Type Questions)

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

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

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

4. In a TDMA cellular system, the one way bandwidth is 12.5 MHz. The channel bandwidth is 30 kHz and there are 395 voice channels in the system. The frame duration is 40 ms, with 6 time slots per frame. The system has an individual user data rate of 16.2 kbps in which the speech with error protection has a rate of 13 kbps. Calculate the efficiency of the TDM frame.

5. Distinguish between Bluetooth and Hyper LAN.

6. What are the advantages and disadvantages of wireless LAN ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) Describe the protocols of a GPRS system.

   b) What are the basic differences between wireless WANs, and what are the common features ? Why is the PHY layer in IEEE 802·11 subdivided ?

   c) List the entities of mobile IP and describe data transfer from a mobile node to a fixed node and vice versa. $4 + (3 + 2) + 6$

8. a) State and explain WAP architecture design principles.

   b) How can we reach the security in WAP applications ?

   c) Explain the WML document modes with examples.

   d) What are the various protocols used in WLL ? What are the services provided by WLL ? $4 + 3 + 4 + 4$

9. a) What do you mean by hidden terminal problem in adhoc network ? Suggest a method to improve it.

   b) Explain why frequency reuse concept is utilized in a GSM system and write its advantages. $7 + 8$

10. a) What is handoff ? How is handoff different from roaming ?

b) Explain management of mobility in GSM network. 7 + 8

11. Write short notes on any *three* of the following : 3 × 5

a) Agent discovery related to IPV4

b) Iridium system

c) 3G

d) Voice across the Internet

e) Pilot, synchronization and paging channels in IS-95 CDMA

f) Physical layer description in WLAN.

END