University of Barishal
Department of Computer Science and Engineering
Course Title: Mobile Computing
Course Code: CSE-4225
4th Year, 2nd Semester
Admission Session: 2016-2017

Marks: 60

Time: 3 Hours

N.B.: Answer any **FIVE** questions out of the followings. All parts of each question must be answered consecutively. Right side of the question shows the maximum marks.

1.a) Explain, using a block diagram, the process of authentication in a GSM service.   4

b) Show a client-server computing architecture in which the database is at the application tier. How does this architecture differ when the application server fetches the data from the enterprise server tier?   4

c) Write short note on the following: 4

     i) IEEE 802.11 variants   ii) Threats and security in Mobile Computing

2.a) What is Hand-off. How the handover decision takes place in GSM depending on receiver signal strength? Explain.   4

b) Write a note on Mobile IP and explain the process of IP Packet delivery.   4

c) List and explain the major functionalities of Mobile Computing.   4

3.a) Differentiate between portability and mobility. Give examples of mobile and wireless devices.   3

b) What is meant by context-aware mobile computing? Explain with examples.   4

c) What are the limitations of a mobile device? What are the design constraints for application in hand-help devices? List the suggested approaches for the application designer.   5

4.a) In 2.5G/3G mobile networks, several modified TCP schemes such as indirect TCP, snooping TCP and mobile TCP are implemented. What are the impacts of data encryption on these schemes? Within in these TCP schemes, identify   4

- The proxy-based TCP schemes(s)
- The scheme(s) that can preserve an end-to-end TCP
- The TCP scheme that does not use data catching and retransmission between the mobile node and the access point

b) What are the services provided in a GSM system? Explain how a mobile station connects to and talks with another mobile station? How will the in-between interfaces differ when a mobile station connects to a PSTN destination?   5

c) From a network designer's point of view, discuss key performance requirements on future 5G mobile technology. 3

5.a) Consider a homogeneous network having 20 similar machines. All the machines part of the network have same software's. The network implements a distributed computing environment. Consider a scenario where a process P1 is running on a machine M1, the machine M1 is a really busy in handling several tasks, the distributed operating systems have an idle machine M2. Machine M2 doesn't have any information about process P1. Explain what distributed operating system should do to migrate the process P1 from machine M1 to M2. Explain any assumptions you make. 5

b) Scalability is one of the most important design goals for developers of distributed system. How could you measure the Scalability of a distributed system? 3

c) Explain the following GSM interfaces: 4
   i) The radio interface (MS to BTS)   ii) BTS to BSC interface
   iii) Interfaces between other GSM entities   iv) BSC to MSC interface

6.a) How the file-sharing session handled in *coda* distributed file system? Explain with timing diagram. 4

b) Describe the modes of operation for the Mobile File System with necessary diagrams. 3

c) A smart parking system entails an IoT-based system that transmits data about free (and occupied) parking places through a wired or wireless system via the web or mobile application. The IoT device, incorporating a controller and multiple sensors, would be spread across multiple individual parking spaces. Users would enjoy a live update of available parking places and select their convenient space. 5

   • Identify the IoT device required for smart parking system
   • Draw a block diagram with the components used in the design of smart parking system

7.a) What is UI? Differentiate between UX and UI. 4

b) Define memory management. Why it is needed? 4

c) What is the role of Reverse tunneling in route optimization? Explain. 4

8.a) Define sensor network. 2

b) What are the attributes of wearable computing? Explain each of them. 4

c) Write short note on the following: 6

   i) Massive MIMO
   ii) Pervasive computing
   iii) Dynamic spectrum access

"Life is like riding a bicycle. To keep your balance, you must keep moving."
- Albert Einstein