

University of Barishal
Department of Computer Science and Engineering
Course Title: Mobile Computing
Course Code: CSE-4225
4th Year 2nd Semester Final Examination 2021
Admission Session: 2017-2018

Time: 03 Hours

Marks: 60

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) *Mobile Computing a technology that allows transmission of data, via a computer, without having to be connected to a fixed physical link.* 4

The term "Mobile computing" is used to describe the use of computing devices, which usually interact in some fashion with a central information system--while away from the normal, fixed workplace. Mobile computing technology enables the mobile worker to create, access, process, store and communicate information without being constrained to a single location. By extending the reach of an organization's fixed information system, mobile computing enables interaction with organizational personnel that were previously disconnected. It provides the continuous access to the wireless network services and the flexible communication between the people. It provides the real-time business to employee communication, enhanced customers interactions, and fastest communication between the individuals. The communication occurs with the real-time wireless connection. It provides the data, audio and video access to any user, any time with a wireless enable device.

The wireless network may be WLAN, Wi-Fi, GSM, CDMA, WiMax or GPRS. There are many companies that provide the mobile computing solutions on contract and pay as you go mobile broadband plans to the home users and businesses. The cell phones and laptops are the most commonly used mobile computing devices. It can be referred to the two main fields portable and mobility.

Now answer the following questions:

i) What are the key aspects of Mobile Computing with respect to the different application scenarios? 3

ii) What is an example of Mobile Computing? 3

b) Considered a scenario a person works as Merchandiser in Garment Industry needs to take care of many individuals in Bangladesh and abroad. How Mobile IP works in the context of mobile device. 3

c) 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? 5

2.a) Briefly describe the logical function of Mobile Computing. 3

b) What is Hand-off. List and explain the types of Hand-off. 3

c) As part of the study tour, the CSE second batch visited Cox's Bazar, St. Martin's Island, and Bandarban few years ago. One day, they were going to Teknaf from Cox's Bazar via bus. The Teknaf is a hilly region. In this journey, all mobile users have encountered many call-drops or call discontinuation and weak network coverage. Within the context of this course, I hope you have read the term associated with this issue. Now, answer the following questions: 6

- i) What do you know about the cellular network? Does the cellular network offer any advantages? 3
- ii) What components and technologies are involved in the cellular network? 3
- iii) Which shape of the cell may assure maximum network coverage? How? 3

3.a) What is meant by context-aware mobile computing? Write major challenges and possible solutions. 5

b) List two applications that are context aware system on your mobile phone and explain why they are context aware. 3

c) Give example of five applications that are not context aware and how we can make them context aware. 4

Note: All application must be Mobile App such as Twitter, Instagram, Facebook, etc.

4.a) How do peer-to-peer mobile databases work? Explain with its architecture. 3

b) What are the steps involved in the calling communication process between mobile users? Explain with diagrams. 5

c) What database type is used most frequently in mobile devices to hold information? 2

d) If a telephone system has bandwidth of 3 MHz and every channel needs 30 KHz then calculate the number of channels per BTS. 2

5.a) Draw clear diagram of the GSM system with necessary components and describe it in detail. 4

b) Explain the following GSM interfaces: 6

- i) The radio interface (MS to BTS)
- ii) BTS to BSC interface
- iii) Interfaces between other GSM entities
- iv) BSC to MSC interface

c) What is UI? Differentiate between UX and UI. 2

6.a) How Android offers protocols and platforms for mobile computing? Explain. 4

b) How the file-sharing session handled in coda distributed file system? Explain with timing diagram. 5

c) 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

7.a) Briefly describe the challenges and issues in implementing MANETs. 4

b) What do you know about cluster and grid computing? Explain with necessary diagrams. 4

c) Write about pervasive computing (ubiquitous computing) with example. Mention some security and privacy issues of mobile computing. 4

8.a) Write the advantages of Distributed Systems over Centralized Systems. 3

b) Define distributed system. What are the characteristics of distributed system? 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. 6

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