Important Instructions:

1) Open this MS-Word document and start writing answers below each respective question given on page 2.
2) Answers the question in the same sequence in which they appear.
3) Provide to the point and concrete answers.
4) First read the questions and understand what is required of you before writing the answer.
5) Attempt the paper yourself and do not copy from your friends or the Internet. Students with exactly similar answers or copy paste from the Internet will not get any marks for their assignment.
6) You can contact me for help if you have any doubt in the above instructions or the assignment questions.
7) All questions must be attempted.
8) Do not forget to write your name, university ID, class and section information.
9) Rename you answer file with your university ID# before uploading to SIC.
10) When you are finished with writing your answers and are ready to submit your answer, convert it to PDF (no MS Word) and upload it to SIC unzipped, before the deadline mentioned on SIC.
11) Do not make any changes to the format provided.
12) Failure in following the above instructions might result in deduction of marks.

Final Exam, Course: - Mobile Computing

Deadline: - Mentioned on SIC   **Marks: - 50**

Program: - BS (CS), BS-SE   **Dated: 24 June 2020**

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Class and Section:_8th semester "B"

Q1: **Provide the names of 4 challenges that exist in Adhoc Networks.**   **(4)**

Answer: Infrastructure-less design
2: Dynamic topology
3: Scalability
4: Energy constraints.

Q2: **How the nodes in the Adhoc Network know about the changing network topology.   (2)**

Answer: Since the network nodes are mobile, an adhoc network will typically have a dynamic topology which will have profound effects on network characteristics, nodes are not familiar with the topology of their networks, they have to discover it

A new node announces its presence and listens for announcements broadcast by its neighbors

Each node learns about others nearby and how to reach them, and may announce that it too can reach them.

Q3: **Why is it important to minimize flooding of control packets in Adhoc Networks and how MPR achieves it?**   **(4)**

Answers: Because when there is flooding in your network, all the nodes will receive those packets which are not destined to them and so, multipoint relay minimizes the flooding of control packets in the network by reducing duplicate retransmission in the same region.

Q4: **Explain briefly how Mobile Cloud Computing is different than simple mobile computing and simple cloud computing?**   **(4)**

Answer: Mobile cloud computing at its simplest refers to an infrastructure where both the data storage and the data processing happens outside of the mobile device. Mobile cloud

applications move the computer power and data storage away from mobile phones and in to the cloud, bringing applications and mobile computing to not just smart phone users but a much broader range of mobile subscribers whereas simple mobile computing is a technology that allows transmission of data, voice and video via a computer or any other wireless enabled device without having to be connected to a fixed physical link and in cloud computing the practice of using a network of remote servers hosted on the internet to store, manage, and process data, rather than a local server or a personal computer.

Q5: **Explain the term MBaas in your own words?** **(4)**

Answer: In general, the purpose of an MBaas platform is to provide developers with a means to connect their frontend application with backend cloud storage and APIs exposed by a backend application. The intended outcome is that it frees developers from thinking about, worrying about, managing, or performing any tasks related to servers.

An MBaas platform will typically provide a number of basic operations, such as user management, push notification support, and social networking APIs for social login, posting etc.

Q6: **Imaging you visit a completely new city. What kind of services a modern LBS can provide you at your location automatically?** **(6)**

Answer: Location based services are services offered through a mobile phone and take into account the device's geographical location. LBS typically provide information or entertainment. Because LBS are largely dependent on the mobile user's location, the primary objective of the service provider's system is to determine where the user is. There are many techniques to achieve this.

Some of the most common LBS applications include local news, directions, points of interest, directory assistance, fleet management, emergency, asset tracking, location-sensitive building, and local advertisement.

Q7: **Use your imagination as to how the following context can be used by a context aware application in mobile computing environment?**

(8)
Date/Time
Environment
Emotional state
Focus of attention
Orientation
User preferences
Calendar (events)
Browsing history

Answer: Date and time: According to the context aware systems the date and time for the user should be provided by the system on his current location and provide user a option to change

Date and time according to his area of living it should be displayed on the screen by design made of user centric approach.

Environment: The environment is key factor in the context aware systems the system should focus on the how the system will react at the environment change for example in the noise area or at night time or at daylight what's will be behaviors in different conditions for that there is option in phone to adjust brightness, screen density warm or cold.

Emotional state: According to context aware systems emotional state of user can effect mobile computing environment for example, A loud alert is not ideal for all situations. In the same way language, change color should be according to the user.

Focus attention: The system should give importance to the attention of user through context aware systems it can provide some services like in the phone call avoid unnecessary interruption or when the message arrive on the phone flashes a notification every 30 seconds eventually the user will ignore it.

Orientation: The context focus on the mobile phone movement like screen rotation.

User preferences: The context aware system maintains the user preferences by providing the user with certain options such as in the mobile phone color density control, light or dark mode in the phone wallpaper or theme change control.

Calendar: the context aware system focuses on the system time zones and global date and this way the user have the personalized calendar and keep track of the events which will occur different to different users according to his area.

Q8: **Explain why energy efficiency is important in technologies like Bluetooth and ZigBEE?** **(4)**

Answer: Mobile phones have limited battery duration so it is important that bluetooth must be energy efficient so that transmission of large data files is possible without any hassle and zigbee is basically used for two-way communication between sensors and control system for eg in home, so energy efficiency is important to reduce billing.

Q9: **Explain briefly how you use RFID technology at INU on a daily basis when present on the campus? Do you use an active or passive tag?** **(4)**

Answer: When I enter into INU, first I log-in into campus and after attending class I used it for my attendance mark, and if I have to check my GPA I use i-wiz machine, and I use passive tag.

Q10: **Explain how Wearable Computing can be employed in computer gaming?** **(5)**

Answer: Wearable computing can be employed in computer gaming through the new technology in which you would wear bands, vests helmets with small sensors on your hands, legs, forehead, chest etc so that the character in the game would function as you would move your body. For eg smart watches, VR gaming etc.

Q11: **What kind of facilities and technologies must be present in order to call you own home a Smart Home?** **(5)**

Answer: A smart home refers to a convenient home setup where appliances and devices can be automatically controlled remotely from anywhere with an internet connection using a mobile or other networked device, for a home to be called a smart home or smart house. A home automation system will control lighting, climate, entertainment systems, and appliances. It may also include home security such as access control and alarm systems.