

## **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.**

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**Final Exam, Course: - Mobile Computing**

**Deadline: - Mentioned on SIC**

**Marks: - 50**

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

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**Student Name: \_\_\_GUI FAYAZ KHAN\_\_\_\_\_ Student  
ID#: \_\_\_12939\_\_\_\_\_**

**Class and Section: \_\_\_B\_\_\_\_\_**

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

**Answer: Infrastructure-less design**

**Dynamic topology**

**Scalability**

**Varied link/node capabilities**

**Energy constraints**

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

**Answer :**The nodes in the Adhoc Network know about the changing network topology when 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?**

Answer: Routing tables are updated periodically whenever the network topology changes so it is important to minimize the flooding of control packets in adhoc network and the multipoint relay MPR achieves it by minimizing the flooding of broadcast packets in the network by reducing duplicate retransmission in the same region.

(4)

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

Answer: Mobile Cloud Computing or MCC is a combination of cloud computing, mobile computing, and wireless network, in order to bring rich computational resources to mobile users, network operators, as well as cloud computing providers. To make it possible for the rich mobile applications to be executed on a huge number of mobile devices. And the other hand simple Cloud computing means storing and accessing data through internet instead of storing on computer hard drive. If we store our data in the hard drive it is called local computing.

On the other hand simple Mobile computing is the technology that allows transmission of data, voice and videos by using the computer or any other wireless devices without having to be connected to a physical link.

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

**Answer:** MBaaS is Mobile backend as a service in simple word it is a platform where the web and mobile developers link their app to the backend cloud storage and with some common feature such as user management, push notifications and social networking integration etc.

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

**Answer:** I am imagining the city where I am visiting a completely new city where the LBS should provide services such as on the GPS base software application which help to find the nearest restaurant and hotel on the personalization base and also give the navigation of that destination and tracking my location to the family member and give amazing features that I can chat with family and friend through that application.

**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

The date/time is important in a user environment such as when the person enters the office and when he leaves and also use for reminding some important work by mentioning date and time.

### Environment

In a context environment the application when a student enters the class the mobile automatically switches to silent mode and when he leaves the class it goes back to normal mode.

### Emotional state

According to a context aware system the emotional state of a user can affect the mobile computing environment. For example, a loud alert is not ideal for all situations in the same way language change colour should be according to the user.

### Focus of attention

The system should give importance to the attention of a user through a context aware system can provide some services like in the phone call avoid unnecessary interruption or when the message arrives on the phone flashes a notification in every 30 seconds.

### Orientation

Orientation means the context aware system has the capability to provide a user device to adjust the screen in every change for example auto rotate mode in a smart phone.

### User preferences

The context aware system maintain the user preferences by providing the user with certain option such as in the mobile phone color density control.etc

Calendar (events)

The context aware focus on the system timezone and global date this way the user personalize calendar and keep track of the events

Browsing history

The context aware of browsing is when system off due electricity or some other issues the system browsing system the history or automatically restore the recent pages.

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

**Answer:** Bluetooth: is the most common connection method between two portable devices. It is usually found in vehicles, connecting the phone with the audio system, Therefore, a significant number of Bluetooth communications are likely to be found near the road network. Bluetooth's advantage is the usage of frequency hopping that continuously search for free channels to be used in data exchange.

ZigBee: is an uncommon technology to be used for vehicle communications, as it was designed for smart home device networks, being capable of fast data transfers (at low data rates) between a substantial number of devices.

**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: I will use the passive tag because when every we enter the gate system should required RFID card to swipe on system then the system identify us the we enter into campus in the class teacher start the class through the card and system run the timer when the timer stop then we should swipe the card and system mark the student is present after when we check the time table or some thing else then swipe the card on the machine and then print out the timetable fees date sheet etc and give the feedback.

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

Answer: The wearable computing can be employed in the computer gaming such virtual reality it is very common in the gaming . same as playstation games Had come up with the solution that can be used in computer gaming. Same as holo suit which is used in the gaming and many more gaming wearable solutions like the apple watch series 4 , oculus quest, jaguar –f pace etc.

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

The a smart home means connecting max of electrical appliances to mobile phone such as CCTV camra , air condition , water pumps, electrical other appliances such as medical instruments BP set steaming and exercising machines. Connecting mobile phones mean that



it can be easily access from any place through internet.