

## **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**

**Dated: 24 June 2020**

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**Student Name: Inzamam      Student ID#: 12998**

**Class and Section: BS (SE-8) Section A**

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- Q1: Provide the names of 4 challenges that exist in Adhoc Networks. (4)**
- Q2: How the nodes in the Adhoc Network know about the changing network topology. (2)**
- Q3: Why is it important to minimize flooding of control packets in Adhoc Networks and how MPR achieves it? (4)**
- Q4: Explain briefly how Mobile Cloud Computing is different than simple mobile computing and simple cloud computing? (4)**
- Q5: Explain the term MBAas in your own words? (4)**
- Q6: Imagine you visit a completely new city. What kind of services a modern LBS can provide you at your location automatically? (6)**
- 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**

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

**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)**

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

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

Question No. 1:

Ans:

4 Challenges:

- 1: Ad hoc can cause in changes routes and can cause in loss in packets.
- 2: Ad hoc network has limited wireless range and packets will loss in communication between users.
- 3: The nature of communication is broadcasting, for example, live streaming, video buffer, advertising.
- 4: Ad hoc mobile nodes has less battery life and finite volume(capacity).

Question No. 2:

Ans:

The nodes in the Ad hoc network is wirelessly connected in a self healing and configured network. MANET nodes are liberated to move randomly because the topology often changes. Every node behaves like a router as they send node to the alternate node in the network.

Question No. 3:

Ans:

In Adhoc Networks it is necessary to cut back flooding of management packets as a result of flooding is also overpriced in terms of wasted bandwidth. Whereas a message might have just one destination that sent to every host. Within the case of a ping flood, it is going to be harmful to the responsibility of a network. Messages will duplicate inside the network which will increase the load on the network still as requiring an increase in method quality to disregard duplicate messages. The flooding of broadcast packets are minimized by Multipoint Relay inside the network.

Question No. 4:

Ans:

It is different because the mobile cloud computing is designed on ideas of mobile and cloud computing, it depends on wireless network to bring computing resources to mobile users. The MCC objective is to enable the execution of rich mobile apps on a plethora of mobile device. And mobile computing is that the technology that enables communication of information by using the computer, laptop or any other wireless device while not be connected to other physical link, And cloud computing is merely means that storing and accessing the information through web rather than storing computer device

Question No. 5:

Ans:

In simple words MBaaS consume time a lot, A customized backend does not need setting because the developer has already implemented it that keep you focused on your essential matters. MBaaS provides you a best experience of the app. MBaaS gives you an opportunity to not worry about what is functioning on the server's background. MBaaS provides you easy scalability and control the things in the background to give your app a good power and flexibility.

Question No. 6:

Ans:

A location based service(LBS) is basically provides you services or information about the location you are present in. The most common services that LBS provides you are social networking services, location based advertising tracking systems etc. It includes mobile commerce which include weather services and also location based games.

Question No. 7:

Ans:

Date/Time: According to the context aware system the date and time for the use 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 y design made of user centric approach

Environment: is the 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 noisy area or at the night time or at daylight what's will be behavior in different conditions for that there is option in phone to adjust brightness, screen density warm or cold.

Emotional State: according to context aware system emotional state of the 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 of Attention: the system should give importance to the attentions of user. Through context aware system they can provide some services like in the phone call Avoid unnecessary interruption or when the message arrive on the phone flashes a notifications every 30 seconds eventually the user will ignore it!

Orientation: means the context aware system have capability to provide user device to adjust the screen in every change, for example auto rotate mode in smartphone to adjust screen to the orientation device. Apple watch turns on display if arm lifted or rotated.

User preference: the context aware system maintain the user preference 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 systems 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 user according to his area.

Question No. 8:

Ans:

A large-scale detector network using detectors like Bluetooth and ZigBee on the bulk of vehicles would definitely be capable of providing helpful information.

The ability of devices to attach quickly to every alternative, due to full charged battery, the energy of device is higher within the initial. The ZigBee's 26th channel wasn't interrupted by

alternative communication, whereas Bluetooth, with the frequency hopping approach, would possibly face a stuck condition, therefore delaying the primary step of the communication method. For ZigBee only channel 26 is used.

Bluetooth cannot avoid interference by default. We can conclude that ZigBee technology can offer valuable support for large scale energy networks.

Question No. 9:

Ans:

The RFID card we have a tendency to use as a student of INU on routine, it is said to be passive RFID, because tag power supply is energy transferred using RF from the reader. Battery does not available in it. It needs a powerful signal. It's range is restricted that is 3m to 5m, when the card is swept on the RFID reader it starts working. The data storage is limited from 16 bits to 1kb.

The multi tag reading can acknowledge some hundred tags inside 3m of reader. At the speed of three mph it takes three seconds on a single read.

Question No. 10:

Ans:

We can employed VR gaming in Wearable computing. VR contains many devices like virtual reality, mediating reality and sensors etc. When you wear these equipment your gaming experience becomes totally different, for example, one of your equipment are glasses when you wear it, it feels real like you are in gaming world. Computer gaming has also VR compatibility but you will need the equipment to play games.

Question No. 11:

Ans:

In order to make your home smart home can be include,

Security:

Security will keep away intruders, it can provide smart locks that applied on doors.

My smart home should have Time to time update. (e.g, temperature of home, notifications about appliances, updates about the vulnerability of devices etc.)

The other technologies that makes your home a smart home includes:

Sensors:

Sensors like PIR sensors, motion sensors, Temperature sensors, heat sensors etc.

Cameras:

Cameras like CCTV camera, night vision camera, thermal camera etc.

Scanners:

Scanners like magnet scanner, body scanner and for securing your smart home network, Avira Home Guard should be used.