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**

Student Name: Muhammad Safeer Student ID#: 13033

Class and Section: BS (SE 8) Section A

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: **Imaging 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 1
Answer:

The challenges in Adhoc network are as following:

- Infrastructure less design.
- Dynamic topology.
- Scalability.
- Energy constraints.

Infrastructure less design:

- This network is complicated in fault detection.

Dynamic topology:

- Dynamic topology changes the route of the information and packets are lost, through which the information is dispersed and incomplete.

Scalability:

- Scalability is still an issue and yet it is not solved. Addressing the nodes, routing nodes, configuration management and interoperability are challenges in scalability.

Energy constraints:

- Power processing is limited and ad-hoc networks rely on nodes, which are known to be routers.

Q2:
Answer:

They contain set of mobile nodes connected wireless in a very self-designed, self-healing network while not having a hard and fast infrastructure. Manet nodes are absolve to move at random because the configuration changes often. Every node behave as a router as they forward traffic to different specific node within the network.

Question 3
Answer:
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 4
Answer:

Mobile Cloud Computing
Mobile Cloud Computing refers to associate infrastructure wherever each the information storage, and also the processing happens outside the mobile device. Mobile cloud

applications move the computing power and information storage far from mobile phones and into the cloud, transfer applications and mobile computing to not simply smartphone users.

Similar with Cloud Computing, there are plenty however, no accordant definitions on what mobile cloud computing is.

In mobile cloud computing, the previous mobile device-based intensive computing, information storage and mass informatics are transferred to cloud and so the necessities of mobile devices in computing capability and resources are reduced, therefore the developing, running, deploying and victimization mode of mobile applications are completely modified.

Mobile Computing

Mobile computing is Human-computer interaction by that a pc is predicted to be transported throughout traditional usage. Mobile computing relies on a group of 3 major concepts: hardware, software system and communication.

Software of mobile computing is that the various mobile applications within the devices, like the mobile browser, anti-virus software system and games.

Cloud Computing

It introduces that the main operate of a cloud computer system processing system is storing data on the cloud servers, and uses of cache memory technology within the consumer to fetch the information. It provides a definition from the attitude of marking that cloud computing may be a parallel and distributed computer system, that is combined by a bunch of virtual machines with internal links.

The framework of cloud computing is split into four layers, that are information centers layer, infrastructure layer, platform layer, and application layer

Q5:
Answer

Mobile Back-end as a Service:

Mbaas indicate Mobile bank end as a service. In easy words, it's the simplest way of empowering mobile developers with prepared rear mobile resources, APIs, and cloud storage in order that the mobile application development method may be fast-tracked.

mBaaS supplier will build things behind the curtain to provide your app the facility and suppleness it wants. Mobile Backend as a Service supplier is serving up API at their finish, they'll have access to any or all the traffic analytics. mBaas give social media integration, information management, database, file storage, genus API and infrastructure

Question 6
Answer:

- It recommends social events in a city
- Request to a nearest business or service such as retail store, ATM, restaurant.
- Turn by turn navigation to any address.
- Assistive health caring systems
- Location based advertisement
- Mobile callers' location can be sent as an emergency call using advanced mobile location.

Q7:
Answer:

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.

Q8:
Answer:

A large-scale detector network using detectors like Bluetooth and ZigBee on the bulk of vehicles would definitely be capable of providing helpful information, but has major impediments like the equipment put in the vehicles should be energy efficient enough and be capable of transferring the specified quantity of information in due time, as the vehicle passes by the road side unit that acts as interface with the traffic management system.

Bluetooth, because of its specific protocol, cannot avoid interference by default. We can conclude that ZigBee technology can provide valuable support for large scale energy networks. So the energy efficiency is important in technologies to perform the better performance.

Question 9:

Answer:

The RFID card that we use as student of student on daily baisis, that is passive RFID because the tag power source is the energy which is transferred using RF.

It does not consist of battery tag.
It requires strong signal strength.

Its range is upto 3-5 m, and its works when it is swept on RFID reader.

Question 10
Answer:

Wearable computing can be employed in computer gaming as Prio VR gaming.
Prio VR gaming consist of different equipment which includes sensors, mediating reality, virtual reality etc. A user puts that equipment on his/her body as a kit for playing different games.
It is a virtual platform in computer gaming.
Kit includes VR glasses, that provides an experience to the user as if he/she is actually inside that game.
It includes sensor information to read the gestures of user.

Question 11
Answer:
The facilities that is present in smart home are:

- Security
- Connectivity
- Health

1) Security: It means that to keep the home safe from intruders, check doors and locks etc.

2) Health: Health means to track health routine, measuring BMI, and analyze physical health etc.

3) Connectivity: Connectivity means to control devices, connection with neighbors and updates via email.

The technologies which facilitate a smart home:

Sensors: The sensors are motion sensors, heat sensors, PIR sensors temperature sensors, pressure sensor etc.

Cameras: The cameras which are used in homes are night vision camera, thermal camera, CCTV cameras etc.

Scanners: The scanners that are used in homes are body scanners, magnet scanners, steel scanners etc.