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: <u>BSSE VIII Section A</u>

<u>Q1:</u> Provide the names of 4 challenges that exist in Adhoc Networks.   (4)

Answer: Four Challenges Name
1. Infrastructure-less design
2. Dynamic topology
3. Scalability
4. Varied link/node capabilities

<u>Q2:</u> How the nodes in the Adhoc Network know about the changing network topology.   (2)
Answer: Nodes aren't conversant in the topology of their networks they need to get it:
- A replacement node announces its presence and listens for announcements broadcast (beacon or "alive" messages) by its neighbors

- Each node learns about others nearby and the way to succeed in them, and should announce that it can also reach them

                        Or

The nodes in the Adhoc network moves freely that's why nodes know about the changing network topology.

<u>Q3:</u> Why is it important to minimize flooding of control packets in Adhoc Networks and how MPR achieves it?   (4)
Answer: It is important to minimize flooding of control packets in Adhoc Networks because
Reduce Control Packet Size: its gives information about only those links which are neighbors with it and also select multipoint relay selector set.
If we reduce the duplicate transmission so the number of control packets are also reduce. If We want to reduce flooding we used a few node relay points to send information.

Multipoint Relay minimizes: MPR is used to achieve to minimize the flooding of broadcast packets in the network by minimizing the number of duplicate retransmission of data in the same location.

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

Answer: Mobile Cloud Computing: Mobile Cloud Computing refers to an infrastructure where both the info storage and therefore the processing occur outside of the mobile device. Mobile cloud applications move the info storage faraway from mobile phones into the cloud ,bringing applications and mobile computing not only to smart phone users but also to a way broader range of mobile subscribers .

Mobile Computing: It is a technology that permits transmission of knowledge, audio and video through a sensible phone or the other wireless enabled device without having to be connected to a hard and fast physical channel . The mobile computing means to access data through portable devices like PDA, smart phone, tablet then on.

cloud computing is collection of remote servers in network to permit centralized data storage and online communication to computer services or resources . Internet and not on personal devices to supply on-demand access. Applications are run on a foreign server, all the processing task done on remote server then result sent to the user.

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

Answer: MBaaS stands for Mobile Backend as a Service Provide web and mobile app developers with how to attach their applications to backend cloud storage and processing while also delivering common features like user management, push notifications, social networking integration, and other features that mobile users demand from their apps lately.

Q6: Imaging you visit a completely new city. What kind of services a modern LBS can provide you at your location automatically? **(6)**
Answer:
        If I visit the new city the modern LBS should provide the following services at my location automatically:

• Recommending social events during a city
• Requesting the closest business or service, like an ATM, restaurant or a mercantile establishment
• Turn-by-turn navigation to any address
 • Assistive healthcare systems
 • Receiving alerts, like notification of a purchase on gas or warning of a holdup

• Location-based mobile advertising
• Contextualizing learning and research
• Games where your location is a component of the sport play, for instance your movements during your day make your avatar move within the game or your position unlocks content.
• Real-time question and answer go around restaurants, services, and other venues.
• Sending the location of the mobile caller during an emergency call using Advanced Mobile Location

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/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 noisy 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 of attention
The system should give importance to the attentions of user. Through context aware systems the can provide some services like in the phone call Avoid unnecessary Activate Wind interruption or when the message arrive on the phone flashes a notification every 30 seconds eventually the user will ignore it.
Orientation
Orientation means the context aware system have capability to provide users device to adjust the screen in every change for example auto rotate mode in Smartphone to adjusts the screen to the orientation of the device ,Apple Watch turns on display arm lifted/rotated.

User preferences
The context aware system maintain 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 (events)
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 user according to his area.

Browsing History
The context aware system refer to the events of the past as history. You can also refer to the past events which concern a particular topic or place as its history.

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

The ability of devices to connect quickly to each other, the energy of devices are higher in the initial stage because of full battery charge. It was found that the ZigBEE 26 channel was not interrupted by other communications, while Bluetooth, with the frequency hopping approach, might face a stuck condition, thus delaying the first step of the communication process. For ZigBEE only channel 26 is used. 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 saving sensor networks. So the energy efficiency is important in technologies to perform the better performance.

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:

RFID(Radio Frequency identification) are work on AIDC (Automatic identification and Data Capture) techniques. AIDC method automatically identifies the objects and collect data about them. So in our university this technology is good than cards swap because this method just identify the object and mark its presence. In university we used ACTIVE RFID tag because active tag has both microchip and antenna which have more power and capabilities.

Q10: **Explain how Wearable Computing can be employed in computer gaming?** **(5)**
Answer:
Wearable computing can be employed in computing gaming through augmented reality which overlying virtual information on real world this realities enhance the senses.

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

Answer:

Following are the facilities and technologies that must be present in order to call home as a smart home.

1. Smart thermostats
2. Smart smokes and carbondixoide detector
3. Smart locks
4. Smart doorbells
5. Smart kitchen
6. Control fan and light through mobile application
7. Smart phone or tablet use remotely through internet connection
8. Use washroom taps through sensors when we wash our hand and bring hand infront of tap so automatically tap is on.
9. Security when someone enter to house use special cards for unlock the door.
10. Control kitchen appliances through remote control.