Final Exam, Course: - Mobile Computing

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

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Class and Section: BS(SE) Section B

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

Ans: These are the four challenges that exist in Adhoc Networks are:

- Broadcast nature of the communication.
- Battery Constraints
- Packet lose due to transmission errors
- Cause route changes, frequent network partitions and packet lose.

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

Ans: The topology of a wireless unplanned network can change from time to time, since network nodes move around from within the range to the skin, and new network nodes may join the network, even as existing network nodes may leave the network.

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

Ans:

1. OLSR Reduces size of control packets : Nodes advertise information only about links with neighbors who are in its multipoint relay selector set OLSR Reduces number of control packets by reducing duplicate transmissions : Reduces flooding by using only multipoint relay nodes to send information within the network.
2. (MPR) is that the capability of simultaneous decoding of over one packet from multiple concurrent transmissions. Continuous investigations on increasing the reception capabilit are giving new scientific contributions.

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

Ans: Mobile Cloud Computing is different than simple mobile computing and simple cloud computing are :

- **Mobile Cloud Computing:**

  Run an application such as Google's gmail for mobile on a remote source rich server. Other mobile devices themselves too as resource providers of the cloud making up a mobile peer-to-peer network.

- **Simple cloud computing:**

  Simple Cloud computing refers to both the application delivered as services over the internet and the hardware and systems software in the datacenters that provides those services.

- **Mobile Computing:**

  A computing environment over physical mobility.The User of a mobile computing environment will be able to access data, information or other logical objects from any device in any network while on the move.

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

Ans: MBaas Stands for (Mobile backend as a service)

a) It's a pre-built cloud hosted infrastructure that enables web and mobile applications to access backend APIs, storage, and various social networks seamlessly.
b) It provides mobile application developers a way to connect their applications to backend cloud storage and processing.

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

Ans: LBS stands for (Location Based Services) . The services a modern LBS can provide to me are:

a) Can point me to the nearest restaurant.
b) LBS can send me an SMS message advertising a sale at a nearby shopping mall.
c) directory assistance
d) fleet management
e) asset tracking

Q7: Use your imagination as to how the following context can be used by a context aware application in mobile computing environment? (8)

Ans:

- **Date Time:**

Context awareness is the ability of a system or system component to gather information about its environment at any given time and adapt behaviors accordingly. Contextual or context-aware computing uses software and hardware to automatically collect and analyze data to guide responses.

- **Emotion:**

Emotion recognition is part of affective computing, which aims to recognize how the person feels, such as happy, sad, anger, disgust, fear, surprise. Traditional works about emotion recognition mainly focus on the characteristic of the person itself, such as audio, text, facial expression, body posture. However, the feelings of people can easily be affected by the context information.

- **User Preferneces:**

Context-aware user preferences play an important role in adapting the behaviour of pervasive systems to satisfy the individual user in different contexts. Most of the pervasive system prototypes that have been developed, incorporate context-aware user preferences, capturing them in an appropriate form and using them to personalize the behaviour of the prototype.

- **Orentation:**

People could be refined to number of people, age, and gender. The weather could include temperature and whether it rains or not. By providing such a structured space, it becomes easier to link contexts in the real world to adaptations in the system. Try as an example to do a full feature space for the menu and define appropriate adaptations. Even a checklist could be considered as a very simple example of a non-hierarchical feature space.

- **Environment:**

In order to be more effective, virtual prototyping systems need to be able to understand changes in the context of the user and to deliver the right information at the right time on an as-needed basis[1]. This is the goal of context-aware virtual prototyping (Aziz, 2003)

- **Browser:**

On a typical day a user wakes up at say
06:00; this context (of waking up) causes his mobile phone
to download and execute wake-up content, through which
the user can manage the dwelling's lighting, television

- **Calender (event):**

Context-aware applications provide end-users with enhanced experiences by continuously sensing their environment and adapting their behaviour to match the current context of use. However, developing true context-aware applications remains notoriously difficult due to the unpredictable nature of context changes

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

Ans: **Bluetooth:**

According to the Bluetooth network specifications, one of the modules was set as Master and the other one as Slave, with search for a pair and connection establishment being set to automatically.

It is to be underlined that Bluetooth v4 was used in these tests due to the fact that it was

the state of the art Bluetooth technology available at the beginning of the research project. Although during the meantime the Bluetooth v5.0 specifications were made available for the market, test modules were not available until recently.

- **ZigBee:**

- The great advantage of this technology is that it uses Adaptive Frequency Hopping, a technique that automatically selects the communication channel according to the detected degree of interference.
- ZigBee, as opposed to Bluetooth, may communicate on a specific channel, making it (at least in theory) sensitive to other communications in the same frequency band. For the evaluation of this interference

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)

Ans: We use RFID technology at INU on a daily basis when present on the campus is by swiping our RFID cards on the sensor.

- It verifies our identity and validity and then proceeds us to main menu where we can see our registered subjects, results, timetable etc.,
- We also use RFID cards for attendance purpose and the procedure is same.

❖ **Passive Tags**

- No internal power source (powered by the RFID reader)
- Shorter read ranges
- Less expensive

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

Ans: It is known that the gaming applications designed for wearable devices possess the capability to integrate built-in elements from the devices like gyroscopic motion sensing and gesture tracking to serve an interactive game experience.

Because wearable tech devices turn prevalent among businesses and consumers, it is certain that the demand for applications which can execute on them increases. The utility and expediency of wearable devices would offer unique benefits for any business targeting to seek profit on the recent technological trends.

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

Ans: The facilities and technologies must be present in order to call you own home a Smart Home are:

- Smart TVs connect to the internet to access content through applications, such as on-demand video and music. Some smart TVs also include voice or gesture recognition.
- Using smart locks and garage-door openers, users can grant or deny access to visitors. Smart locks can also detect when residents are near and unlock the doors for them.
- smart lighting systems, such as Hue from Philips Lighting Holding B.V., can detect when occupants are in the room and adjust lighting as needed
- Providing Wi-fi signals Connectivity throughout the home so that that it can be accessed by every smart devices.
- smart security cameras, residents can monitor their homes when they are away or on vacation.