

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

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Class and Section: BSSE(A)

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

ANS: following are the four challenges:

- 1. Infrastructure-less design:** ad hoc network detect fault and add difficulty in fault and perform management.
- 2. Dynamic topology:** use to change path and packet loss
- 3. Scalability:** unsolved challenges that include different operations like routing, configuration management and addressing.
- 4. Energy limits:** limit processing power, ad-hoc network rely on each node being a router.

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

ANS: AD-hoc incorporates set of mobile nodes connected wirelessly. New nodes announce their existence and listen to broadcast announcements by their neighbours. Manet nodes are liberated to move indiscriminately because the network topology changes often. Every node behaves as a router as they forward traffic to other specific node with the network.

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

ANS: **10D-** MRP proposed an intelligent mobility management procedure to handle the multicast mesh. In other words, the receiver compares the paths and determines which is the best. Source is then informed for future routing. This intelligent procedure can maintain and optimize the multicast monitoring the traffic and learning about states of the mesh. A control message due to

flooding can be reduced significantly. 10D-MRP cm guarantee that there is always a path (normally a stable) between multicast senders and receivers.

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

ANS: Mobile Computing: It is an interaction between man and machine. It includes mobile communication, hardware and software for mobile devices. In this computer is expected to be transported during normal usage which makes it possible to transmit data, voice and video.

Cloud Computing: Cloud computing covers large range of options, from the basics storage, networking, and processing power through to natural language processing and artificial intelligence as well as standard office applications. Cloud computing is the delivery of on-demand services.

Mobile Cloud Computing: All this terminology is very important to understand how each one differs from the other one. Therefore, we look into the key ways in which cloud technology differs from the others. In order to bring rich computational resources to mobile users, network operators, as well as cloud computing providers. The idea here is to make it possible for the rich mobile applications to be executed on a huge number of mobile devices. Mobile Cloud Computing (MCC) is a combination of cloud computing and mobile computing also wireless network.

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

ANS: Mobile Backend as a Service (MBaaS). Understanding the value of mBaaS you need to have a good understanding of how a mobile app is developed. In other words, it's the model that provides web app and mobile app developers to link their app to the backend cloud storage. It is a way of empowering mobile developers with ready backend mobile sources like APIs, and cloud storage and it is one of the most easily available upfront solutions for companies.

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

ANS: If i visit a new city where I have never been before. The modern location services provide me navigation technologies in devices such as mobile phones. That enables in location services, with new opportunities based on the ability of users to identify their precise location relative to services and people.

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: Notification/reminder of a daily used application.

Environment: notification related weather.

Emotional state: showing help and support.

Focus of attention: featuring things mostly used(Apps)

Orientation: guiding/helping the user.

User preferences: keeping record of user preference.

Calendar (events): reminding upcoming events(birthdays/meetings)

Browsing history: previous record of users search/news.

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

(4)

ANS: The ability of devices to connect quickly to each other, the energy of devices are higher in the initial stage because of full charge. It was found that ZigBee26 channel wasn't interrupted by other communication, while Bluetooth with hopping frequency approach, might face a stuck condition. Energy efficiency is important for end sensory devices with limited energy sources that are connected by means of wireless sensor networks. The reason of the production of unnecessary communication or periodic transmission of data from sensory.

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: RFID works on Automatic identification and Data Capture (AIDC). It automatically identifies the objects and collect data. In our university it works better than swiping cards because it identifies the object and mark its present or absent. We use Active RFID in university because it have both chip and antenna which have more power and capabilities and operates better.

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

(5)

ANS: Wearing computing can be employed in computer gaming by using different technologies related to wearable computing e.g VR headsets, VR Remote controller, Tactical Gaming Vests and many others. All of these helps you to feel the gaming experience on a much better level. Some allows you to feel the reality of gaming world by wearing the specific products e.g body mounted sensors.

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

(5)

ANS: There are several facilities and technologies to turn you simple home to smart home and can assist you in every household job. Some are as following:

- 1. Smart doorbells:** Nowadays you don't have to walk to the front door to see who is ringing the doorbell. Smart doorbells which are relatively inexpensive and easy to install that let you monitor, and even talk to, whoever is at your door without even being at home yourself, providing an added boost to home security.
- 2. Smart locks:** These locks are generally touchpad enabled and completely keyless. In addition to features like automatic locking allow you to lock and unlock your door from your phone. You can even create individual passcodes for different people who may need to access your home
- 3. Indoor and outdoor cameras:** Today's most advanced home technology is focused on making our houses more secure, and cameras are no exception. Many people use them just to record what's going on outside home or to keep an eye on pets but cameras are useful home security. They've become so popular and a lot cheaper to purchase.
- 4. Smart Kitchens:** kitchen can't exactly cook dinner for you but you Fridge can be connected to the internet so you can view what's inside of it when you're at the store. It allow you to make adjustments to your cooking even while you're away at the office and smart plates and forks that help you monitor food and calorie intake if you're watching what you eat.
- 5. Robot Vacuums:** Robot vacuums do the dirty work for you, making frequent trips around your home to suck up dirt, debris, crumbs, pet hair, and whatever else is lying around before manually returning themselves to their charging stations. No installation required. Just set up the charging dock and you're set.