

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 and upload it to SIC unzipped, before the deadline mentioned on SIC.**

Mid Semester Assignment, Course: - Mobile Computing

Deadline: - Mentioned on SIC

Marks: - 30

Program: - BS (CS), BS-SE

Dated: 13 April 2020

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Class and Section: BSSE (A) 8th semester

Question1: Explain why wired networks have higher bandwidth in comparison to mobile networks. (2)

Question2: Explain the relation between miniaturization and portability. (3)

Question3: Differentiate between convergence and divergence. (3)

Question4: Suppose you are given the task of designing an app for mobile devices which has the capabilities of text chat, recorded audio message, and live video conferencing. Explain which protocol out of UDP and TCP would you use for each type of service and why? (4)

Question5: Suppose you have the choice of using 2G, 3G, 4G, 5G, Wi-Fi and Satellite networks. Which of these technologies will you use in the following scenarios and why. (18)

- a) A city wide network with voice, SMS services and Internet services good enough for ultra-high definition streaming and video conferencing.
- b) A city wide network with only voice and SMS services.
- c) A city wide network with voice, SMS services and Internet services good enough for normal definition streaming and video conferencing.
- d) A global scale network with voice, SMS and Internet services.
- e) A campus size network for information and resource sharing between 200 end devices.
- f) A city wide network with voice, SMS and basic Internet services.

Question # 1:

As maximum data transfer rate depends upon the bandwidth, the wired network has higher bandwidth than mobile network because the wired network has:

- High power machines.
- High resource access.
- Low delay in operations.
- Electricity travels faster than radio waves.
- Signal degradation.
- A high bandwidth connection can serve many requests at a time without sinking up the speed.

Question # 2:

Relation between Miniaturization and Portability

Miniaturization.

- Miniaturization is a term that is used for the new technology which has been shrank in size, produces more power, consumes less power and enhanced in performance than the previous one. (Processors, chip sets, boards and many more).
- As the size of a device is reduced and produces more power than the last one makes it more portable which means it becomes easier to carry a miniaturized device in any place.
- For example:
 - a. Mobile phone miniaturization.
 - b. Miniaturization of computers.
 - c. Vehicle engine miniaturization etc.

Portability.

- Portability means that the devices or nodes connected within mobile computing system to facilitate mobility. These devices have limited device potentialities and limited power supply but have sufficient processing potentialities which can be move easily.
- Smaller device or any program can be easily connected with other devices or operating systems.
- For example:
 - a. Mobile phones.
 - b. Tablets.
 - c. Laptops.
 - d. Software that runs on different operating systems etc.

Question # 3:

Convergence.

- Convergence means that to integrate the merging types of digital mobile devices. Such as Personal Digital Assistance (PDA's), mobile phone, music players, games etc.
- Many functionalities combined to make a single device which performs functions of two different devices in one device. Such as mobile phone, it can perform all the tasks of a calculator and yet it has many other options in it.

Divergence.

- Divergence means that the approach to interact the design by promoting information appliances with specialized functionalities rather than generalized ones. Such as pagers, remotes, printers etc.
- A single device that can only perform the task which it is meant for. Such as pagers, which are used for only conveying messages. And camera which are only used for capturing a photograph or movie. Although a mobile phone can do both, that is why mobile phones are convergent.

Question # 4:

I would choose UDP (User Datagram Protocol) because:

- Connection-based communication model is never restricted, that is why startup latency is low in distributed application
- Block boundaries are included in UDP because the recipient receives the packets disobedient.
- UDP provides multicast and broadcast transmissions.
- Data loss can be made.
- Small transaction (DNS lookup).
- Applications with intensive bandwidth, which can suffer packet loss.
- UDP is connectionless protocol. UDP is ideal for multimedia like VoIP. (Voice over Internet Protocol).
- UDP is fast in speed.

Question # 5:

Part (a)

4g and 5g are suitable for city wide network because the others cannot provide ultra-hd streaming, although 3g connection provides video conferencing and the availability of Wi-Fi is not everywhere as they are only provided by ISP's. satellite connection is generally used nationally or globally, it does not fit in the given scenario.

Part (b)

2g connection is suitable for the given scenario because the internet services or data transfer is not required, though the satellite connection is used for communication purpose but it provides even more than only voice and SMS services.

Part (c)

3g and 4g is suitable for the given scenario because both of the connections can provide streaming and video conferencing. But 4g is much better than 3g in terms of speed.

Part (d)

Satellite is suitable because the satellite connection is used globally. From space, it can transfer data and can communicate with headquarters on earth in the distance of approximately 23000 miles.

Part (e)

Wi-Fi is the best option for the given scenario, campus sized network is achievable with Wi-Fi. For example: CMH has its own network which connects all the departments within the hospital, so that if a doctor wants to refer a patient to another doctor, he will directly refer the patient through the network. Which is based on Wi-Fi.

Part (f)

2g and 3g networks will fit in this scenario because both of these networks provide voice, SMS and basic internet facilities but 3g network overcomes the 2g network in terms of speed, functionality and advanced internet applications.