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: BS (SE-8) Section A

<u>Question1:</u> Explain why wired networks have higher bandwidth in comparison to mobile networks.   **(2)**

Answer: Wired networks have higher bandwidth than mobile networks because of high resources access provided in wired networks, low delay in operations, high data transfer rate and also less packet loss. As in wireless networks data packets might get loss higher than in wired networks where low packets are loss. In wireless networks the speed throttling is higher than in wired networks.

<u>Question2:</u> Explain the relation between miniaturization and portability.   **(3)**

Answer: The relation between miniaturization and portability is that they both focus on decreasing the size of the technology so that the user can carry it with him. They both focus on increasing the speed with decrease in technology size. The goal of both is to make the devices smaller and more powerful and thus made available everywhere.

<u>Question3:</u> Differentiate between convergence and divergence.   **(3)**

Answer: <u>**Convergence**</u>: It is the process of combining different features of different devices into one device. It focuses on integrating different technologies such as Personal Digital Assistants (PDAs), mobile phones, music players, cameras, games, etc. into hybrid devices. Example of convergence is smartphones.
<u>**Divergence**</u>: Some people prefer diverged devices in order to get premium features that are better than converged devices. It is the process of separating features to make that features unique. It focuses on making devices with unique and more powerful features. Examples of diverged devices are DSLR cameras, mobile phones, iPods, laptops etc.

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)**

Answer: I will use Transmission Control Protocol (TCP) for this app because it is a connection oriented protocol. For high reliability TCP is used. In TCP the information transferred remains intact and arrives within the same order as it was sent. TCP protocol have a built in feedback system to make sure that all the data was received and sent back exactly as it was intended. In video conferencing the data packets will not be lost which will ensure that there will be no loss in audio or video during conference. While in UDP there is a chance of packet loss which means that there is a chance of not receiving messages sometimes.

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.**

Answer: I will use 4G, 5G, Satellite and Wi-Fi for this scenario because these networks are best for high definition video streaming and conferencing. The data transfer rate of 4G, 5G, Satellite and Wi-Fi is higher which means there will be less buffering in video streaming and high reliability in video conferencing. Satellite will provide high speed internet throughout the city. These networks have low latency and high data transfer rates. Security is also high in these networks.

b) **A city wide network with only voice and SMS services.**

Answer: I will use 2G networks in this case because for voice calls and SMS only 2G is enough and cheap. Satellite can also be used for communication but it is mostly used for higher purpose so 2G is best and suitable for voice and SMS services. It has a bandwidth of 25 MHz which is good enough for making voice calls and using SMS services.

c) **A city wide network with voice, SMS services and Internet services good enough for normal definition streaming and video conferencing.**

Answer: I will use 3G and Wi-Fi for this scenario because these networks are best for normal video streaming and video conferencing. The data rate of both these networks is high enough to handle normal streaming and video conferencing. 3G has a theoretical bandwidth of 25 MHz and it is also provide high security and international roaming which is good for normal video streaming and conferencing purpose.

d) A global scale network with voice, SMS and Internet services.

Answer: For this scenario I will use 4G, 5G and Satellite because these networks provide global mobility. These networks have extreme speed and low latency. 4G has a bandwidth of 100 MHz theoretically and 5G bandwidth ranges from 30 GHz to 300 GHz which can provide global coverage of high speed internet.

e) A campus size network for information and resource sharing between 200 end devices.

Answer: For this scenario I will use Wi-Fi or small satellite in order to cover those 200 end devices. Wi-Fi will provide good transfer of information and communication for a limited range of devices. Extenders can be used to extend the coverage of Wi-Fi in different departments of campus.

f) A city wide network with voice, SMS and basic Internet services.

Answer: For this scenario I will use 3G and Wi-Fi for basic internet usage. As 3G bandwidth is 25 MHz which is good enough for basic internet usage. ISPs provide normal internet speed with cheaper internet packages so Wi-Fi can also be used for basic internet usage.