

## **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.**

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**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<sup>th</sup> semester Section A

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

Wired network have higher bandwidth than mobile network due to no any other interference of signal in wired network. Wired network is only meant for one type of signal transmission. Whereas compared to mobile network bandwidth is low due to the presence of many other signals in the environment.

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

**Miniaturization:**

Miniaturization basically means to keep developing products in smaller sizes or downsizing the same products. It generally refers to electronics, in which the size of electronic devices, chips or computer is reduced. Due to low weight and less volume it has many applications.

**Portability:**

Portability means to be easily carried or moved. Portability in mobile computing refers to the system that we carry from one place to another and still achieve our tasks. For example, laptop and mobile both are portable in comparison to computer and we can still achieve our tasks using laptop and mobile instead of computer.

**Question3: Differentiate between convergence and divergence. (3)**

In simple words convergence means coming together and divergence means moving apart. Regarding mobile computing, convergence means multiple tasks that are to be performed in a single device. We can play games, listen to music, send a text message and take a picture on the same device while the other applications are still running.

Divergence in mobile computing means that certain devices are used for one specific task only. Like walkie talkie which is only used for sending and receiving messages. T.V remote used only to make changes to T.V.

**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)**

For text chat and audio messages we will use TCP. TCP stands for Transmission control protocol. We will use TCP because it keeps track of the lost packets and resend it again when the packets are lost. TCP is also reliable and ordered but is slower than UDP.

For live video we will use UDP because it faster than TCP and does not keep track of the lost packets. It also does not send the packets in order and the packets are received in continuous stream that's why it is suitable for live video.

**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.**

In my opinion the right answer would be 4G and 5G. 4G have theoretical speed of 100-300Mbps and 5G have theoretical speed of 10-30Gbps. We can still use video conferencing on 3G but it will not support ultra-high definition. Wi-Fi has limited area coverage and satellite in this scenario cannot be used because they are used globally.

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

2G in this scenario. The other technology can also be used but they are used when internet comes into play. We can achieve both voice and SMS service with 2G and there is no importance of using 3G,4G and 5G as they are simpler tasks. Satellites are used globally for communication and cannot be used in this scenario.

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

3G and 4G in this scenario. Both can provide users with normal definition streaming and video conferencing. 5G can also be used but it is not the ideal one and we can still have normal definition streaming on 3G and 4G. In city wide network Wi-Fi cannot be used.

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

Satellites are to be used in this scenario. Satellite has the ability to receive data from small satellite dishes present on earth and transfer it to orbiting geostationary satellite. Global scale network can be achieved through satellite and there is no need of any other technology infrastructure. 3 satellites at 120 degree apart can cover the whole earth easily.

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

Wi-Fi fits best in this scenario. For a campus size network which is limited area Wi-Fi is suitable because it has limited area coverage. Information and resource sharing can easily be achieved on campus size network through Wi-Fi. For example, in INU we have to connect to the portal through university Wi-Fi network to download our upload files.

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

2G and 3G. For voice and SMS 2G can be used because it works on GSM technology and for basic internet service we can use 3G because it have higher speed than 2G and it uses WCDMA technology.