

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

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Class and Section: ___BS(CS)-5th semester_____

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

Answer:

Bandwidth is the capacity of communication link. The wired network bandwidth (capacity of the communication links) is higher than mobile network, because wired network has lot of capacity while wireless technology uses radio frequencies spectrum which is very scarce resource/limited.

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

Answer:

The relationship between miniaturization and portability is that miniaturization allow to design small microprocessor and microchips smaller in size, faster, cheaper, and more profitable for easily portable devices/computers e.g. PDAs. portability reduces the size of hardware and enable us to moved device around easily.

Question3: Differentiate between convergence and divergence. (3)

Answer:

S.No	Convergence	Divergence
1.	<ul style="list-style-type: none">convergence mean coming together.	<ul style="list-style-type: none">Divergence mean moving apart.

2.	<ul style="list-style-type: none"> The convergence of infinite series implies that the series converges to a single value. (finite of course) 	<ul style="list-style-type: none"> Divergence implied that the series does not approach a single value.
3.	<ul style="list-style-type: none"> convergence is interpreted to mean that a trend is stronger. 	<ul style="list-style-type: none"> Divergence is interpreted to mean that a trend is weak.
4.	<ul style="list-style-type: none"> This is the integrating emerging type of a digital mobile devices e.g. Mobile phone 	<ul style="list-style-type: none"> Divergence can last a long time, so acting on it alone could be mean substantial losses if the price does not react as expected.

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?

S. No	Service	Protocol used
1.	recorded audio message	UDP
2.	Text chat, live video conferencing	TCP

Reason:

- For recorded audio message we will use UDP protocol because
 - It is a connectionless protocol.
 - It is not connection-based, so one program can send lots of packets to another.
 - UDP performs error checking, but it discards erroneous packets.
 - UDP is lightweight. There are no tracking connections, ordering of messages, etc.
 - UDP is faster as error recovery is not attempted.
 - UDP protocol has no fixed order because all packets are independent of each other.
 - UDP is compatible with packet broadcasts for sending all over the network and for multicasting sending.
- For live video conferencing and text chatting we will use TCP protocol because

- It is a connection-oriented protocol.
 - TCP messages make their way across the internet from one computer to another.
 - TCP does error checking and also makes error recovery.
 - TCP is reliable as it guarantees delivery of data to the destination router.
 - TCP offers extensive error checking mechanisms because it provides flow control and acknowledgment of data.
 - TCP rearranges data packets in the specific order.
 - Supports several routing protocols.
 - TCP can be used to establish a connection between two computers.
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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.

Our choice for voice, SMS services, internet for ultra-high streaming and video conferencing in a wide city is **5G**, because it has high network speeds and bandwidth availability which supports top quality video conferencing in HD or even in 3D without any interruptions. following are some main features of 5G:

Period	Bandwidth	Frequency	Data rate	Technology
2020-2030	1000x BW pr unit area	3 – 300 GHz	1Gbps and higher	WWWW

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

For city wide network with only voice and SMS service we will use 2G/2.5G technology but it has enough bandwidth and speed for communicate through voice and SMS. It utilized digital signals for voice transmission. This gave us smaller devices, a more secure connection, better call quality, and a higher capacity for connectivity.

following are some main features of 2G:

Period	Bandwidth	Frequency	Data rate	Technology
1990 – 2000	900MHz	1.8GHz (digital)	64kbps	Digital cellular (GSM)

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

for city wide network with voice, SMS services and Internet services good enough for normal definition streaming and video conferencing we will use 4G technology because of high bandwidth, high data rate and speed.

The features of 4G technology is as following:

Period	Bandwidth	Frequency	Data rate	Technology
2010 – (2020)	100MHz	2 – 8 GHz	100Mbps – 1Gbps	LTE, WiFi

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

For global scale network with voice, SMS and internet services we will use satellite communication or 5G technology because they provide better way of communication without interruption and high data rates for data transmission or conferencing without any interruption.

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

Wi-Fi technology is enough for small size networks within the campus or building for communication purposes and for sharing resources.it has low cost, high speed and security. Wi-Fi is the technology of 4G. having following features:

Period	Bandwidth	Frequency	Data rate	Technology
2010 – (2020)	100MHz	2 – 8 GHz	100Mbps – 1Gbps	LTE, WiFi

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

For wide city network with voice, SMS and basic internet services we will use 4G technology because its resources are good enough for all these type of communication with low cost, Hight speed and better quality of communication.

Period	Bandwidth	Frequency	Data rate	Technology
2010 – (2020)	100MHz	2 – 8 GHz	100Mbps – 1Gbps	LTE, WiFi