National University of Computer and Emerging Sciences, Lahore Campus

Course:	Computer Networks	Course Code:	CS-3001
Program:	BS (Computer Science)	Semester:	Fall 2023
Duration:	25 Minutes	Total Marks:	15
Paper Date:	06-Sep-2023	Weight	2.5%
Section:	BCS (5B)	Page(s):	2
Exam:	Quiz 1	Roll No.	

Name & Section: _____

Attempt all questions on the question booklet. Rough sheets can be used but it should not be attached. State your answers in readable handwriting and with the help of diagrams, where necessary. Cutting / over-writing is strictly prohibited and will result in zero mark in MCQs.

Question # 1: **[5 marks, CLO # 1]**

Choose the correct option.

1. **For over a hundred years, _____ has been used by telephone networks.**
   (a) Twisted pair copper wire (b) Coaxial cable
   (c) Fiber optic cable (d) None of the given option
2. **An access ISP is connected with two regional ISPs and one global ISP. This connection is known as:**
   (a) Multi-home Connection (b) Multi-region Connection
   (c) Multi-globe Connection (d) None of the given option
3. **The two main types of switching networks are:**
   (a) Routers and Switches **(b) Circuit-switched and Packet-switched**
   (c) Wi-Fi and Ethernet (d) None of the above
4. **Which of the following is a delay that packets can experience in packet-switched networks?**
   (a) Queuing delay (b) Propagation delay
   (c) Transmission delay **(d) All of the above**
5. **True or False? The performance at a node is often in terms of delay as well as the probability of packet loss.**
   (a) True (b) False

Question # 2: **[2 marks, CLO # 1]**

What advantage does a circuit-switched network have over a packet-switched network? What advantages does TDM have over FDM in a circuit-switched network?

A circuit-switched network can guarantee a certain amount of end-to-end bandwidth for the duration of a call. Most packet-switched networks today (including the Internet) cannot make any end-to-end guarantees for bandwidth. FDM requires sophisticated analog hardware to shift signal into appropriate frequency bands.

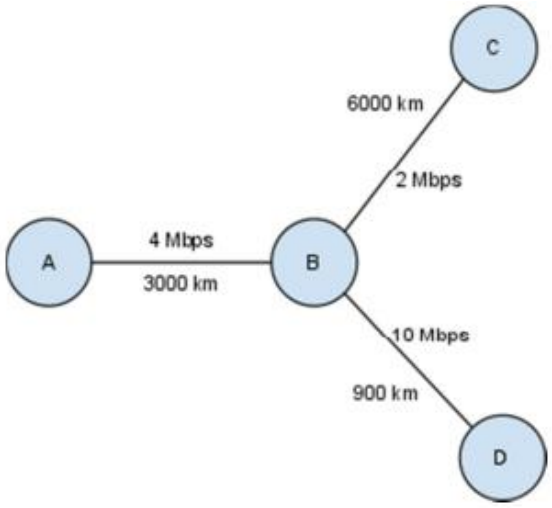
Question # 3: **[3 marks, CLO # 1]**

Consider sending a packet from a source host to a destination host over a fixed route. List the delay components in the end-to-end delay. Which of these delays are constant and which are variable?

The delay components are processing delays, transmission delays, propagation delays, and queuing delays. All of these delays are fixed, except for the queuing delays, which are variable.

Question # 4: **[2.5 + 2.5 marks, CLO # 1]**

Assume data travels through the links at the speed of light (i.e. 3 x 10^5m/s).



1. **What is the transmission delay if A sends 700 byte packet to B:**

   A to B: Transmission Delay = Size of transfer / Link Bandwidth = 700 bytes / 4 Mbps

   = 700 x 8 bits / 4 x 10^6 bps = 0.0014s or 1.4ms

2. **What is the propagation delay between B and C:**

   B to C: Propagation Delay = Distance of Link / Speed of Light

   = 6000 meters / (3 X 10^5) meters/seconds = 0.02s or 20ms