National University of Computer and Emerging Sciences, Lahore Campus

Course:	Computer Networks	Course Code:	CS307
Program:	BS(Computer Science)	Semester:	Fall 2019
Duration:	20 Minutes	Total Marks:	20
Date:	11 Sep, 2019	Quiz:	1
Section:	E	Page(s):	1

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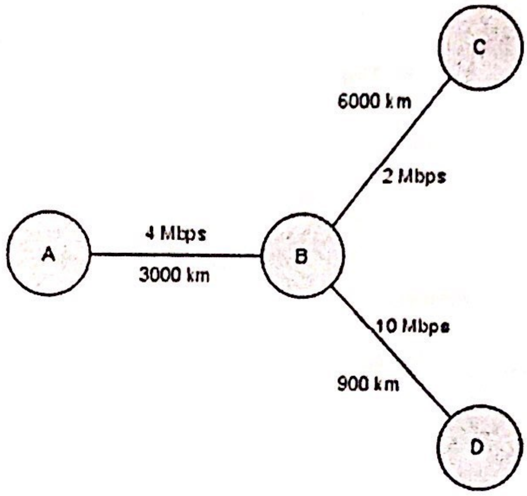
Question 1: **[Marks 8]**

Speed of light 3×10^8

Assume data travels through the links at the speed of light.



(a) What is the transmission delay if

- A sends a 700byte packet to B
- B sends a 700byte packet to C

=> 700 × 8 / 1000×1000×4 = 5600 / 4000000 => 0.0014. 2

(b) What is the propagation delay between

- A to B
- B to C

3000km / 4Mbps = 750 msec for A to B and for B to C = 6000km / 2Mbps = 3000 msec.

Question 2: **[Marks 6]**

A wants to send a 700byte packet to **C** through **B**. **B** is supposed to follow the store-and forward model, that is, B will receive the whole packet from A and then start transmitting the packet to **C**.

(a) What is the **end-to-end delay** seen by the packet?
(b) What will be the throughput from A to C?

Question 3: **[Mark 6]**

(a) If **C** starts sending 700 byte packets back-to-back to **B**, then how many packets will **C** have transmitted before B starts receiving the first packet sent by **C**?
(b) What does this value have to do with the term "**bandwidth-delay product**"? **(Extra Credit)** **[Marks 3]**

700 byte packet = 5600 bits.

2 Mbps = 2000 000 bits per second.

60 000 / 300 000 000 × 250,000.