

National University of Computer and Emerging Sciences, Lahore Campus  
**Quiz .....1 [BSCS: Section D] Fall 2022**

**Computer Networks (Code: CS3001)**

**Quiz Date: September 07, 2022**

**Total Marks: 12**

**Weight: 2%**

**Duration: 20 -Minutes**

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Name ----- Roll #----- Section -----

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**Instructions:** Attempt all questions on this sheet. You can make use of rough sheet (do not attach to this sheet).

**Q1:** Differentiate between Circuit Switched and Packet Switched Networks. **(2 Marks)** **[CLO 2]**

**Q2:** Consider a packet of length 1000 bytes, which starts at source end system and travels over 10 links to destination end system. Nine packet switches connect these ten links. The transmission rate of all ten links is 2 Mbps. Suppose that propagation speed on all 10 links is  $2 \times 10^8$  m/s. and each packet switch incurs a processing delay of 5 msec (assume zero processing delay at end systems). Moreover, suppose that the distance is the same i.e., 1000 km between all links (i.e., distance from source end system to packet switch 1, from packet switch 1 to packet switch 2, ..., and from packet switch 9 to destination end system is the same). Moreover, consider that no queuing delay exists, then what is the end-to-end delay for these values? **(3+3+2+2=10 Marks)** **[CLO 4]**

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**Start writing your Answers from here and then use backside of this sheet.**

**Answer Q1:**

Circuit switched networks establishment connection before data transfer phase and then release connection after the data transfer phase. There is dedicated path between source and destination throughout the communication and data is delivered in order. The failure of a single switch is fatal for the communication.

While datagram approach of packet switched networks does not need to establish connection. Different packets can follow different path and hence can reach the destination out of order.

**Solution Q4:**

Length of packet =  $L = 1000 \times 8 = 8000$  bits

Transmission rate of links:  $R_1=R_2=R_3=R_4=...=R_{10}=2 \text{ Mbps} = 2 \times 10^6 \text{ bps}$

So Transmission delay of each link (L/R):  $d_{trans1} = d_{trans2} = d_{trans3} = ... = d_{trans10} = 8000 / 2 \times 10^6 = 4 \text{ msec}$

Propagation speed of links:  $s_1 = s_2 = s_3 = ... = s_{10} = 2 \times 10^8 \text{ m/s}$

Distance between links:  $d_1 = d_2 = d_3 = ... = d_{10} = 1000 \text{ km}$

For one link =  $d_{prop} = d/s = 1000 \times 10^3 / 2 \times 10^8 = 5 \text{ msec}$

So propagation delay of one link = 5 msec

Processing delay of each packet switch:  $d_{\text{proc1}} = d_{\text{proc2}} = d_{\text{proc3}} = \dots = d_{\text{proc10}} = 5 \text{ msec}$

$d_{\text{end-end}} = 10 * d_{\text{trans}} + 10 * d_{\text{prop}} + 9 * d_{\text{proc}} = 10 \times 4 + 10 * 5 + 9 \times 5 = 40 + 50 + 45 = 135 \text{ msec}$