National University of Computer and Emerging Sciences, Lahore
Campus **Quiz ……1 [BCS: Section 5B] Fall 2024**

Computer Networks (Code: CS3001) **Quiz Date: September 03, 2024**

Total Marks: 12 **Duration: 20 -Minutes**

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

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

Q1: Identify and encircle the correct option(s). **(3 Marks)** **[CLO 1]**

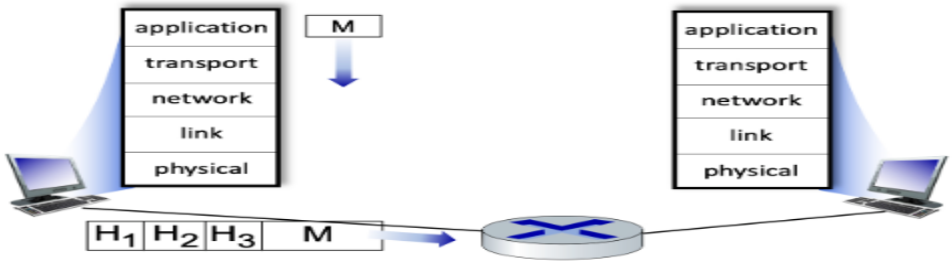
I. An access ISP is connected with two regional ISPs and one global ISP. This connection is known as:
(a) Multi-home Connection (b) Multi-region Connection
(c) Multi-globe Connection (d) None these

II- Which kind of delay(s) packets can experience in packet-switched networks?
(a) Queuing delay (b) Propagation delay
(c) Transmission delay (d) All of these

III. The performance at a node is often in terms of delay as well as the probability of packet loss.
(a) True (b) False

Q2: Q1: The folowing figure shows a link layer frame with three header fields heading from a host to a router. Write the name of appropriate layer: **(3 Marks)** **[CLO 1]**

I. Header H2 belong to Network---------- layer.
II. Header H1 belong to Data link---------- layer.
III. Header H3 belong to Transport----------layer.



Q3: 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 2×10^8 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? **(2+2+1+1=6 Marks)** **[CLO 1]**

Solution

Length of packet = L = 1000 x 8 = 8000 bits
Transmission rate of links: $R_1=R_2= R_3= R_4 = ... = R_{10} =$ 2 Mbps = 2×10^6 bps
So Transmission delay of each link (L/R): $d_{trans1} = d_{trans2} = d_{trans3} = ... = d_{trans10} = 8000/ 2 \times 10^6 = 4$ msec

Propagation speed of links: $s_1 = s_2 = s_3 = ... = s_{10} = 2 \times 10^8$ m/s
Distance between links: $d_1 = d_2 = d_2= ... = d_{10}$=1000 km
For one link = $d_{prop} = d/s = 1000 \times 10^3 / 2 \times 10^8 = 5$ msec

So propagation delay of one link = 5 msec

Processing delay of each packet switch: $d_{proc1} = d_{proc2} = d_{proc3} = ... = d_{proc9} = 5$ msec

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