**National University of Computer and Emerging Sciences, Lahore Campus**

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| | **Course Name:** | **Computer Networks** | **Course Code:** | **CS 3001** |
| | **Program:** | **BS (SE)** | **Semester:** | **Spring 2025** |
| | **Duration:** | **15 minutes** | **Total Marks:** | **15** |
| | **Paper Date:** | **06-February-2025** | **Section** | **6C** |
| | **Exam Type:** | **Quiz 1 - Chapter 1** | **Page(s):** | **2** |

**Student Name** **Roll No.** **Section:**

**Q1. Encircle the correct option:** **[5 marks] [CLO 1]**

Which of the following is an **end system** in a network?

a) Router
b) Link Layer Switch
c) Mobile Phone
d) DSLAM

Which delay is caused by **buffering and queuing** of packets at a router?

a) Propagation Delay
b) Queuing Delay
c) Transmission Delay
d) Processing Delay

In a **packet-switched network**, how are resources allocated for communication?

a) Resources are pre-allocated along a dedicated path.
b) Resources are shared on demand.
c) All resources are allocated to the receiver.
d) Resources are not allocated.

**True/False:**

i. **Propagation delay** depends on the size of the packet. *(T/F)*
ii. **Circuit switching** provides guaranteed bandwidth for a connection. *(T/F)*

**Question 2:** **[Marks 10] [CLO 1]**

A company has established a network connection between End System 1 (ES1) and End System 2 (ES2), which consists of three segments connected through two routers (R1 and R2). The first segment between ES1 and R1 spans 5000 km, the second segment between R1 and R2 spans 4000 km, and the third segment between R2 and ES2 spans 1000 km. Each link operates at a data rate of 2 Mbps. The packet size being transmitted is 1500 bytes and the propagation speed is $2.5\times10^8$ m/s. Additionally, both routers (R1 and R2) incur a processing delay of 5 milliseconds each. Calculate the transmission delay & propagation delay for each segment (Segment 1, Segment 2 and Segment 3) and also calculate the total end-to-end delay from ES1 to ES2 while considering the effects of both transmission and propagation over each segment, as well as processing delays at the routers.