

# National University of Computer and Emerging Sciences (Lahore Campus)

## Quiz 6: Link Layer (Chapter 6)

Name: \_\_\_\_\_

Roll No: \_\_\_\_\_

Section: BSE-6B1 (Spring 2026)

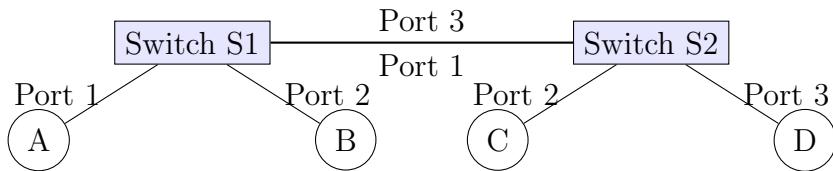
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### 1. (5 points) Switch Tables

Consider the switched LAN topology shown below. The switch tables are initially empty. The following sequence of frame transmissions occurs:

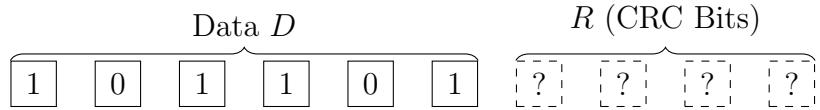
1. Node A sends a frame to Node D.
2. Node D replies with a frame to Node A.
3. Node C sends a frame to Node D.

Show the state of the Switching Table for **Switch S2** after these three events. Format: (MAC Address, Interface). Also, show the same for **Switch S1**.



2. (10 points) **Cyclic Redundancy Check (CRC) and Burst Errors**

Consider a data transmission scenario using a CRC generator polynomial  $G(x) = x^4 + x + 1$ . The data string to be transmitted is  $D = 101101$ .



1. Analytically calculate the 4-bit CRC remainder  $R$ . Show the long division in binary modulo-2 arithmetic. What is the actual bit-string transmitted by sender?
2. A "burst error" of length  $k$  is a contiguous sequence of bits in which the first and last bits are errors, and the intermediate bits may or may not be errors. Can this specific generator  $G(x)$  detect **all** burst errors of length  $k = 3$ . Give reason?
3. Suppose a burst error occurs during transmission such that the received bit string has the 3rd and 4th bits (counting from the left, 1-based index) inverted. Does the receiver accept or reject this frame?