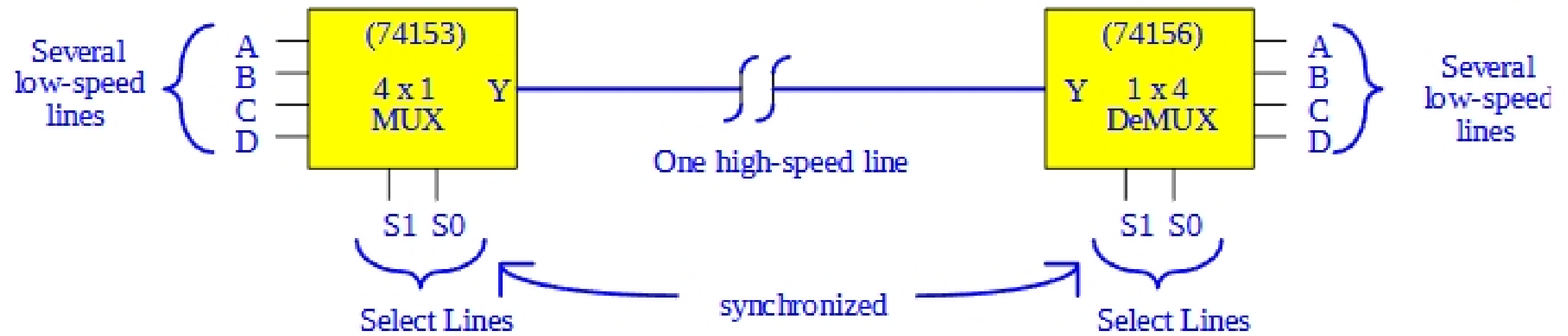


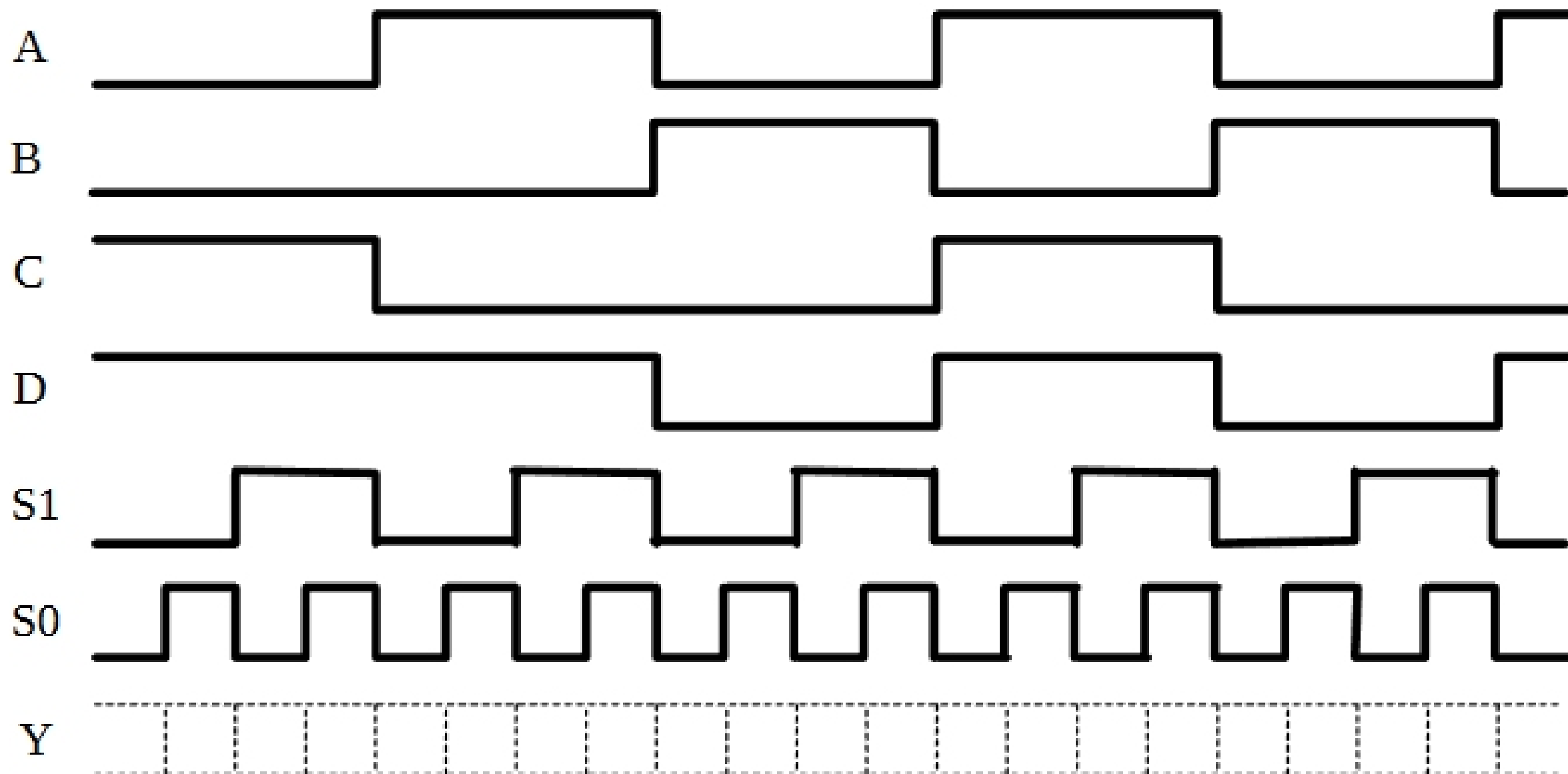
**Reading Assignment: Chapter 3 in Logic and Computer Design Fundamentals, 4<sup>th</sup> Edition by Mano**

### **Multiplexers (Data Selectors)**

- A multiplexer (MUX) is a device that allows several low-speed signals to be sent over one high-speed output line.
- “Select lines” are used to specify which input signal is sent to the output.
- A demultiplexer (DEMUX) performs the opposite task as the multiplexer: it divides one high-speed input signal into several low-speed components.
- Multiplexers and demultiplexers must be synchronized so that the proper signals are selected.
- This type of multiplexing is referred to as *time-division multiplexing* (TDM). Another type of multiplexing is *frequency-division multiplexing* (FDM), which is typically covered in a communications course.
- Multiplexed signals are typically transmitted in precisely organized manners according to a set of rules for transmission called a *protocol*.
- An example of multiplexed signals is shown below using two TTL devices.



**Example** – Sketch Y for the 4x1 MUX above for A, B, C, D, S1, and S0 shown below.



**Multiplexer Design** – Develop a simple Boolean expressions for a 4x1 multiplexer output. Draw the multiplexer circuit.