

Bus Structures

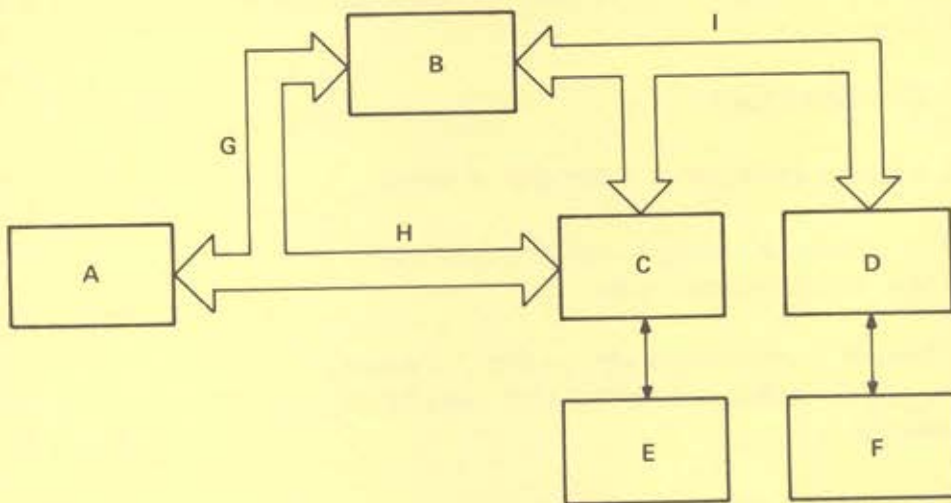
EVALUATION SHEET

1. For each statement below, write a T in the space provided if the statement correctly describes a bus structure. Write an F in the space provided if the statement does not correctly describe a bus structure.

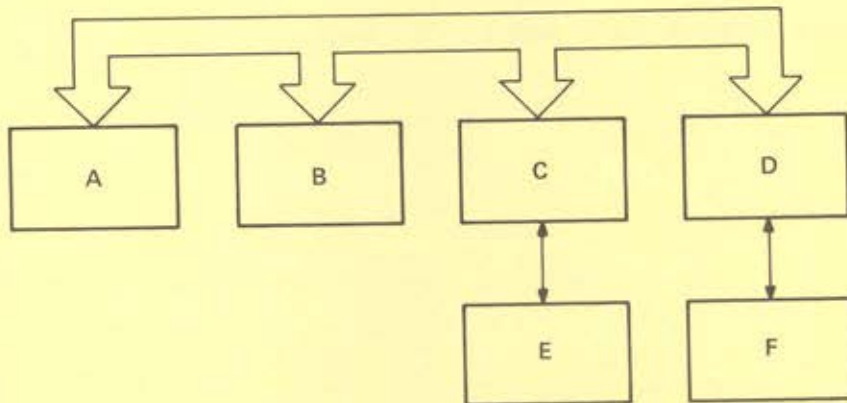
A Bus Structure. . .	T or F
is a cable containing a bundle of wires.	<u> T </u>
is a group of cables each containing a single transmission wire.	<u> F </u>
provides communication paths between the CPU, main memory, and peripheral devices.	<u> T </u>
can transmit any combination of addresses and data on each of its wires.	<u> F </u>
can pass information about data, control signals, and addresses.	<u> T </u>
includes address, data, and control lines.	<u> T </u>

2. Block diagrams of single-bus and 3-bus configurations are given below. A list of components and bus types is also given. Match each component with its position in the diagrams by writing the correct letter in the space provided. Also, match each *bus type* in the 3-bus configuration by writing the correct letter in the space provided.

a. 3-Bus Configuration



b. Single-Bus Configuration



I. 3-Bus Configuration

Components	Position in Diagram
Disk Interface	<u>C</u>
Terminal	<u>F</u>
CPU	<u>B</u>
Terminal Interface	<u>D</u>
Moving Head Disk	<u>E</u>
Main Memory	<u>A</u>
Bus Types	
DMA	<u>H</u>
I/O	<u>I</u>
Memory	<u>G</u>

II. Single-Bus Configuration


Components	Position in Diagram
Disk Interface	<u>C</u>
Moving Head Disk	<u>E</u>
CPU	<u>A</u>
Terminal Interface	<u>D</u>
Main Memory	<u>B</u>
Terminal	<u>F</u>

3. For each statement, indicate whether it refers to a single-bus (SB) or 3-bus (3B) configuration by writing the correct abbreviation in the blank space.

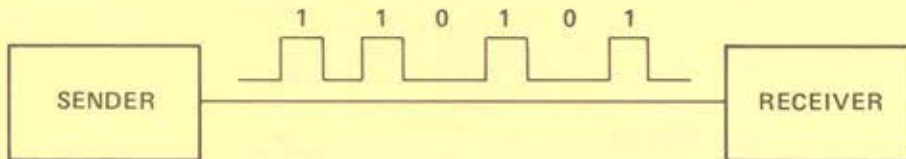
Statement	Bus Type
More versatile data flow.	<u>SB</u>
Larger maximum memory size.	<u>3B</u>
More potential for throughput if multi-ported memory is used.	<u>3B</u>
Fewer machine instructions for programmer to remember.	<u>SB</u>

4. Indicate whether each of the statements below provides true or false information about DMA by writing either T or F in the space provided.

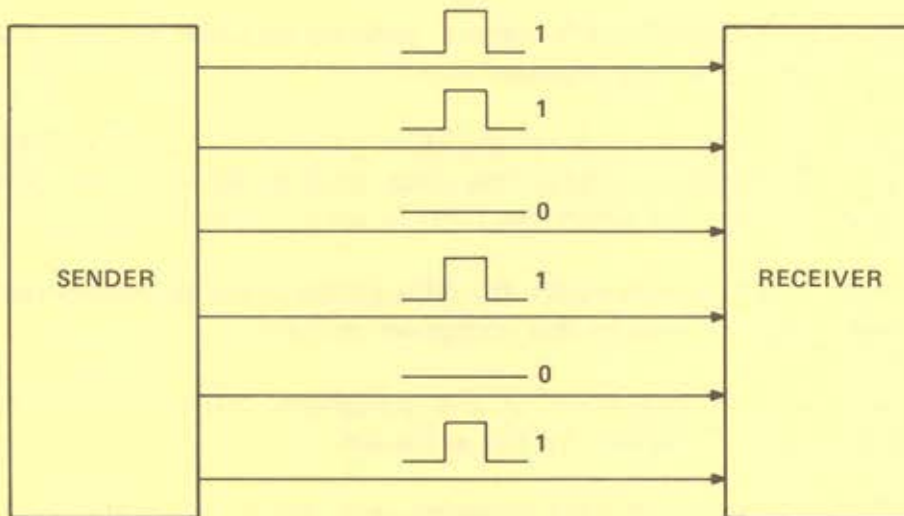
DMA.	T or F
means "data and memory access."	<u>F</u>
means "direct memory addressing."	<u>F</u>
means "direct memory access."	<u>T</u>
refers to busses, interfaces, and devices.	<u>T</u>
refers to busses only.	<u>F</u>
moves information to and from main memory via the CPU.	<u>F</u>
moves information to and from main memory without passing through CPU.	<u>T</u>

5. You are given the binary digits 110101. The pulse () represents a 1, while no pulse (-) represents a 0. Draw both the serial transmission diagram and the parallel transmission diagram for these digits.

a. Serial Transmission



b. Parallel Transmission



6. The six functions of a typical interface and their descriptions are given below. Match each function with its description.

Function	Description
Control	<u>d</u>
Buffer	<u>c</u>
Status	<u>b</u>
Conversion	<u>e</u>
Housekeeping	<u>a</u>
Program Interrupt	<u>f</u>

Descriptions

- a. Performs specialized functions, such as updating a byte counter or current address register.
- b. Monitors the operational situation of the peripheral and stores the information as data. This data, such as READY and ERROR, can be acted on when the CPU is temporarily halted.
- c. Serves as a compensator for differences in the speeds of peripherals and the rest of the computer system.
- d. Governs the operation of the peripheral based on command information supplied by the software.
- e. Performs required data changes (e.g., serial to parallel) so that data can be transferred between the peripheral and CPU correctly.
- f. Halts a CPU whenever a peripheral requires some type of action from the software.