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ADD INSTRUCTION

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1.0x

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1. CHECK YOUR UNDERSTANDING (1/1 point)

Which of the following is a true statement regarding the execution of the LC-3 ADD instruction?

- ☐ The instruction always adds two register values.
- ☐ The bus is used exactly two times: Once during instruction fetch and a second time to write the result from the ALU to the Register File and to simultaneously update the CC register.
- ☐ The Operand Fetch, Execute, and Store Result phases of instruction execution occur over three consecutive clock cycles.
- ☒ The CC register is updated for this instruction. ✓

EXPLANATION

In the Immediate Mode, the instruction adds one register value and a sign-extended immediate (constant) value.

The bus is used three times. During instruction fetch, it is used twice: once to transfer the address from PC to MAR, and a second time to transfer instruction from MDR to IR. The bus is used a third time to write the result and update the CC register.

ADD uses one additional state—occupied for a single clock cycle—after Instruction Decode to perform these three phases in one cycle.

The CC register is updated since ADD writes the Register File.

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