edX　　**CornellX: ENGRI1210x The Computing Technology Inside Your Smartphone**　　　　🏠 **KarenWest**　▼

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NEW PHASES OF INSTRUCTION PROCESSING

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1. CHECK YOUR UNDERSTANDING

For each of the following operations, determine the phase in which it is performed for the new phases of instruction processing.

Note: You will need to reference the LC-3 pipeline diagram for Check Your Understanding 1.

Please click here to open in a new window.

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1 A. CHECK YOUR UNDERSTANDING (1/1 point)

Fetching an instruction from memory.

- ◉ IF ✔
- ◯ ID
- ◯ EX
- ◯ MEM
- ◯ WB

EXPLANATION

The first step in instruction execution is to fetch the instruction in the IF phase.

| Final Check | **Save** | Hide Answer | *You have used 1 of 2 submissions* |

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1 B. CHECK YOUR UNDERSTANDING (1/1 point)

Writing the data to memory for an STR instruction.

- ◯ IF
- ◯ ID
- ◯ EX
- ◉ MEM ✔
- ◯ WB

EXPLANATION

Load and store instructions perform their memory operation in the MEM phase.

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1 C. CHECK YOUR UNDERSTANDING (1/1 point)

Forming the address for a load or store instruction.

- ◯ IF
- ◯ ID
- ⦿ EX ✔
- ◯ MEM
- ◯ WB

EXPLANATION

The ALU is used in the EX phase to form the address for loads and stores.

| Final Check | **Save** | Hide Answer | *You have used 1 of 2 submissions*

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1 D. CHECK YOUR UNDERSTANDING (1/1 point)

Performing the operation for a NOT instruction.

○ IF

○ ID

⦿ EX ✔

○ MEM

○ WB

EXPLANATION

The ALU is used in the EX phase to perform the logical operation NOT.

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1 E. CHECK YOUR UNDERSTANDING (1/1 point)

Reading the source operands from the register file.

○ IF

⦿ ID ✔

○ EX

○ MEM

○ WB

EXPLANATION

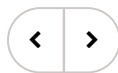The register file is read in ID in parallel with decoding the instruction.

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