

Help

MAJOR COMPONENTS OF THE ISA



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1. CHECK YOUR UNDERSTANDING (1/1 point)

Which of the following is **not** defined by the Instruction Set Architecture specification?

- ☐ The encoding of the instruction types.
- ☐ The number of registers.
- ☐ The width of each register.
- ☐ The number of addressable memory locations.
- ☒ The width of the MAR register. ✓

The ISA specification includes instruction encodings, number and width of registers, and the number of addressable memory locations. It does not require an MAR register.

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## 2. CHECK YOUR UNDERSTANDING (1/1 point)

Which of the following statements **incorrectly** describes the LC-3 ISA?

- ☐ The LC-3 has 8 general-purpose registers.
- ☒ The LC-3 is an 8-bit machine since each register holds 8 bits. 
- ☐ The address space is  $2^{16}$  since addresses are 16 bits wide.
- ☐ All arithmetic operations are performed on two's complement numbers.

### EXPLANATION

The LC-3 supports 8 registers.

The LC-3 is a 16-bit machine, since each register holds 16 bits.

Since addresses are 16 bits wide, the address space (number of addressable locations) is  $2^{16}$ .

The only supported data type is a 16-bit two's complement number, so all arithmetic operations are performed assuming this data type.

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