

Name: _____ Student #: _____ Signature: _____

Calculators not allowed.

1. (2 marks) Explain the difference between volatile and non-volatile memory:

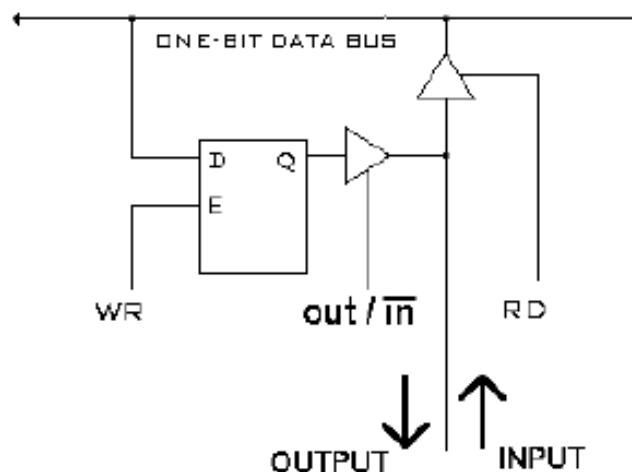
Volatile: Content lost when power removed

Non-Volatile: Content retained when power removed

2. (1 mark) If you are told that your desktop computer is using a 64-bit processor, what does the “64-bit” term reveal about the size of the buses required for the processor?

The processor has a 64-bit data bus

3. (6 marks) Draw the circuit of a bidirectional input/output port. Make sure to label all control signals.



4. (3 marks) How many address lines and how many data lines does a 32K x 16 memory chip have? What is the storage capacity of this memory chip in bytes?

of Address Lines: 15

of Data Lines: 16

Storage capacity (in bytes): 64Kbytes or 65536 bytes

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5. (7 marks) The following decoder circuit is used to decode 8 small sections of memory within a 16-bit memory space. Fill in the addresses in the memory map of the system shown below with the starting and ending addresses of the total 16-bit memory space and starting and ending addresses of the RAM and ROM. Also, fill in the blank to label which block is RAM and which is ROM.

