

## Computer Architecture 16/06/2012

Name:

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1. Describe Moore's law. What are the consequences of Moore's law on the development of computers? Discuss advantages and disadvantages.
2. What are register windows? What type of machines have register windows? Explain how register windows are useful for calling methods (procedures, functions, etc).
3. What does the circuit in Figure 1 do? Provide a short description, and a sample input/output which to illustrate your answer. Is it a combinatorial circuit? Motivate.

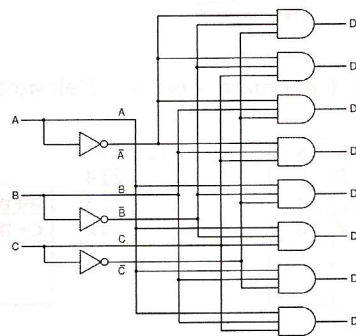


Figure 1: Circuit relevant to subject 3.

4. What is a trap, what is an interrupt? Give examples of typical traps, interrupts. How are they handled? Discuss common features and differences, if any.
5. Consider the Mic-1 microarchitecture (see Figure 2). Describe the role of each register. Describe the memory model of the IJVM. Write the sequence of microinstructions needed to bring the local variable frame from state (a) into state (b), as represented in Figure 3.
6. The von Neumann machine (design). Give a brief description. Why is this important? Did you ever program a von Neumann machine? Is the machine you use (e.g. at home) a von Neumann machine? Motivate all the answers.
7. What is an instruction fetch unit? Can a microarchitecture benefit from such a device? Motivate your answer and discuss the concrete case of Integer Java Virtual Machine microarchitectures Mic-1 and Mic-2.