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CS 33003 Exam #2 CompOrg

Friday 16 October 1998

1. Explain the difference between a D flip-flop and a D latch. (10 points)

2. Draw a diagram showing how a 4-input multiplexer (with inputs i3–i0 and select lines s1–s0) can be built from 2-input multiplexers. (15 points)

3. How does a PLA compare to a field-programmable logic device (FPLD)? (10 points)

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4.	. For each of the following registers, giv	e the full name	of the register,	and briefly	describe v	what
	it is used for: $(3 \text{ points each} = 12 \text{ poin})$	ts)	_	-		

- a. PC
- b. IR
- c. MAR
- 5. Draw a diagram showing how a 1M (2²⁰) x 4 bit memory system can be built using 1M x 1 bit memory chips. Clearly show the address and data lines that connect to each chip. For simplicity, don't show the R/W' and CS lines connecting to the chips unless the connections are different for some chips. (15 points)

6. For a disk system, explain how the terms "platter", "surface", "track", and "sector" are related. (8 points)

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7. For an <u>accumulator</u> machine, write code to execute the statement "D=AD – BC", assuming A is stored at memory location 20, B at location 21, C at location 22, and D at location 23. Do not destroy the contents of any variable except D, which should receive the final value of the computation. (15 points)

8. For an <u>LOAD/STORE</u> machine, write code to execute the statement "D=AD – BC", assuming A is stored at memory location 20, B at location 21, C at location 22, and D at location 23. Do not destroy the contents of any variable except D, which should receive the final value of the computation. (15 points)