

Student Name: _____

Student ID: _____

COMPUTER ORGANIZATION & ARCHITECTURE

MID-TERM 1 (2013-2014)

MAX MARKS: 15

TIME: 1 HR

Q1. Answer the following:

(2)

- a) How many bits would you need to address a 2M X 32 memory if the memory is word-addressable?
- b) How many memory bytes will be required to store the 8085 instruction CALL 6400H?

Q2. A machine with an accumulator has the following values loaded into its memory locations: (3)

MEMORY

Address	Data
800	900
...	
900	1000
...	
1000	500
...	
1100	600
...	
1600	700

What value will be loaded in the accumulator on execution of the following instruction:

- a) LOAD IMMEDIATE 800 _____
- b) LOAD DIRECT 800 _____
- c) LOAD INDIRECT 900 _____

Q3. Identify the accumulator contents and flags as following 8085 instructions are being executed (all flags are reset initially): (3)

	A	S	Z	CY
MVI A, 80H				
ORA A				
RAR				

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Q4. Consider a computer with identical interpreters at levels 1, 2 and 3. It takes an interpreter n instructions to fetch, examine and execute one instruction. A level 1 instruction takes k nanoseconds to execute. How long does it take for an instruction at levels 2 and 3? (1)

Level 2: _____

Level 3: _____

Q5. Suppose we have two implementations of the same instruction set architecture. Computer A has a clock cycle time of 250 ps and a CPI of 2.0 for some program. Computer B has a clock cycle time of 500 ps and a CPI of 1.2 for the same program. Which computer is faster for this program and by how much? (3)

Q6. Suppose a program runs in 100 seconds on a computer, with the multiply operations responsible for 80 seconds of this time. How much do I have to improve the speed of multiplication if I want my program to run three times faster? (3)