Computer Architecture CT-1

Semester	2	Term	II
Date	9/11/2020		

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Write in your own language. If your writing matches with another person or books, it will be given 0. It has to be in your own language.

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1. Which one do you think is better? RISC or CISC? Why or Why not? [2]

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2. Why is it important to consider all three components (CPI, clock rate, instruction count) to assess performance of a computer? For example: if you change clock rate from 2GHz to 2.5GHz. Can it ensure the better result for computer performance alone? Why or Why not? [2]

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3. There is a hypothetical computer with following opcodes:
   0001 Load AC from memory
   0010 Store AC to memory
   0101 Add to AC from memory
   0001 Load AC from memory
   0010 Store AC to memory
   0101 Add to AC from memory
   In these cases, the 12-bit address identifies a particular I/O device. Show the program execution for the following program:
   Load AC from device 5.
   Add contents of memory location 940.
   Store AC to device 6
   Assume that the next value retrieved from device 5 is 3 and that location 940 contains a value of 2. Expand this description to show the use of the MAR and MBR. [4]

4. Difference between synchronous and asynchronous timing diagram (in your own language).[2]

5. Consider three different processors P1, P2, and P3 executing the same instruction set with the clock rates and CPIs given in the following table. [5]

	Processor	Clock Rate	CPI
a	Intel	3.1	1.5
	AMD	2.5	0.9
b	Intel	2	1.2
	AMD	2.9	0.75

i. If the processors each execute a program in 22 seconds, find the number of cycles and the number of instructions.
ii. Which processor has the highest performance expressed in instructions per second?
iii. We are trying to reduce the time by 29% but this leads to an increase of 15% in the CPI. What clock rate should we have to get this time reduction?