



Quiz 1

Name: Solution

Duration: 5 minutes.

Instructions: - No questions allowed.

-Show your work.

Question 1:

(4 Points)

A Program has 1000 instructions, with an Average CPI of 3.

Calculate the CPU time assuming the clock rate is 2GHz

$$\text{Cpu Time} = \frac{1000 \times 3}{2 \times 10^9} = 1.5 \times 10^{-6} \text{ s.}$$

Question 2:

(6 Points)

A Program has the following instructions distribution and number of cycles/instruction:

Instruction	W	X	Y
Percentage	50%	30%	20%
CPI	1	3	4

a) Find the Average CPI for all instructions?

$$\begin{aligned} \text{CPI}_{\text{Avg}} &= 0.5 \times 1 + 0.3 \times 3 + 0.2 \times 4 \\ &= 0.5 + 0.9 + 0.8 \\ &= 2.2 \end{aligned}$$

4pts

b) True or False: You can't reduce the number of instructions, by using a different algorithm.

False

2pts

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22541 - Computer Architecture - Fall 2023



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Question 1:

(4 Points)

A Program has 1000 instructions, with an Average CPI of 5.
Calculate the CPU time assuming the clock rate is 4GHz

$$\text{Cpu time} = \frac{1000 \times 5}{4 \times 10^9} = 1.25 \times 10^{-6} \text{ s}$$

Question 2:

(6 Points)

A Program has the following instructions distribution and number of cycles/instruction:

Instruction	W	X	Y
Percentage	50%	30%	20%
CPI	5	3	2

a) Find the Average CPI for all instructions?

4pts

$$\begin{aligned} \text{CPI Avg} &= 0.5 \times 5 + 0.3 \times 3 + 0.2 \times 2 \\ &= 2.5 + 0.9 + 0.4 \\ &= 3.8 \end{aligned}$$

b) True or False: One way to reduce the number of instructions, is by using a better algorithm.

2pts

True.