

Quiz 1B

رقم الشعبة: 2

رقم التسجيل:

الاسم:

Instructions: Time **10** minutes. Closed books and notes. No calculators. Please answer all problems in the space provided. **No questions are allowed.**

<Good Luck>

Q1. Consider the following performance measurements for a program:

Measurement	Computer A	Computer B
Instruction count	10 billion	8 billion
Clock rate	4 GHz	4 GHz
CPI	1.0	1.1

a) Which computer has the higher MIPS rating? (show your work clearly)

$$\begin{aligned} \text{MIPS}_A &= \text{Clock rate}_A / (\text{CPI}_A * 10^6) && 2 \text{ marks} \\ &= 4 * 10^9 / (1 * 10^6) \\ &= 4,000 \end{aligned}$$

$$\begin{aligned} \text{MIPS}_B &= \text{Clock rate}_B / (\text{CPI}_B * 10^6) && 2 \text{ marks} \\ &= 4 * 10^9 / (1.1 * 10^6) \\ &= 3,636 \end{aligned}$$

Computer A has higher MIPS rating **1 mark**

b) Which computer is faster? (show your work clearly)

$$\begin{aligned} \text{Time}_A &= \text{IC}_A * \text{CPI}_A / f_A \\ &= 10 * 10^9 * 1 / 4 * 10^9 \\ &= 2.5 \text{ seconds} && 2 \text{ marks} \end{aligned}$$

$$\begin{aligned} \text{Time}_B &= \text{IC}_B * \text{CPI}_B / f_B \\ &= 8 * 10^9 * 1.1 / 4 * 10^9 \\ &= 2.2 \text{ seconds} && 2 \text{ marks} \end{aligned}$$

Computer B is faster **1 mark**