BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination: Surprise Test - 1 | Semester: Fall 2024
Duration: 10 minutes | Full Marks: 05

CSE 340: Computer Architecture

Name: Solution	ID:	Section: 0

1. Computer A has a **2GHz clock**, Computer B has a **3GHz clock**. Suppose we run the following code in both the computers. 1+1

```
def calculate (num1, num2, sign):
    if (sign == '+'):
        return num1 + num2
    elif (sign == '-'):
        return num1 - num2
    else:
        return num1% num2
```

Will the instruction count be the same if the ISA is the same in both the computers? Justify your answer.
Answer:

Same code running on Both PCs & ISA same.
Hence, instruction count is also same; Clock rate has no role here.

2. Consider a processor P that has a 5GHz clock rate and a CPI of 2. If the processor executes a program within 10s then **find** the number of cycles and number of instructions. 1.5 + 1.5

Answer:

Clock Rate = 5 GHz = 5×10^9 Hz

CPI = 2

CPU Time = 10s

$$\text{CPU Time} = \frac{\text{Instruction count} \times \text{CPI}}{\text{Clock Rate}}$$

$$\Rightarrow \text{Instruction count} = \frac{\text{CPU Time} \times \text{Clock Rate}}{\text{CPI}}$$

$$= \frac{10 \times 5 \times 10^9}{2}$$

$$= 25 \times 10^9$$

Clock Cycle = Instruction count × CPI

$= 25 \times 10^9 \times 2$

$= 50 \times 10^9$