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Daffodil International University

Department of Software Engineering

Faculty of Science & Information Technology

Quiz-1 , Spring 2026

Course Code: SE222, Course Title: Computer Architecture

Section: 44 J (Set - A)

Marks: 15

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1. A program executes 1×10^6 instructions on a 2 GHz processor with the following instruction mix:

Instruction Type	CPI	Instruction Mix
Integer arithmetic	1	40%
Load	4	30%
Store	3	20%
Branch	2	10%

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a) **Calculate** the average CPI and execution time of the processor using the given instruction mix. **(4 marks)**

b) A second processor executes the same program at a clock rate of 1.6 GHz, but the load instruction requires 6 cycles instead of 4. **Analyze** and **determine** which processor has the lower execution time. **(4 marks)**

c) With a new hardware design, the integer arithmetic unit of the first processor is speeded up by a factor of 10. **Evaluate** the overall speedup of the system. Note - time = Instruction Mix **(4 marks)**

2. A CPU executes a program that reads a character from input, checks if it is a vowel. **Identify** and **describe** the functional units of the CPU that are active during the execution of this program. **(3 marks)**