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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 I

Marks: 15

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1. A program executes instructions on a 2 GHz processor with the following instruction set:

Instruction	Instruction Count	Processor Clock Cycle
Integer arithmetic	420,000	1
Load	330,000	4
Store	210,000	2
Branch	140,000	3

a) **Calculate** the average CPI , MIPS of the processor using the given instruction mix. (4 marks)

b) A second processor executes the same program at a clock rate of 2.6 GHz. However, the load instruction requires 2 cycles instead of 4, while all other instructions retain the same number of clock cycles as in the first processor. **Analyze** the MIPS and **determine** which can execute more instructions per second. (4 marks)

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c) In the year 2020, the first processor contained 10×10^6 transistors. Assume that the number of transistors doubles every 3 years. **Evaluate** the expected number of transistors in the year 2035. **(4 marks)**

2. A CPU executes a program that reads a list of numbers from memory, computes their multiplication, and stores the result back to memory. **Identify** and **describe** the functional units of the CPU that are active during the execution of this program. **(3 marks)**