BRAC UNIVERSITY
Inspiring Excellence

CSE341: Introduction to Microprocessor
Fall 2025
Theory Quiz - 1
Duration: 35 Minutes

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Name:	ID:	Section:

Question 1 [2+3 Points]

a) Explain how the Program Counter (PC) ensures that instructions are executed sequentially in memory, and describe the consequences if the PC were not incremented after each instruction fetch.

b) Compare and contrast the internal architecture of a microprocessor with that of a microcontroller in terms of how components are organized and integrated on the chip.

Question 2 [3 Points]

Consider a smart home automation system that controls lighting, temperature, door locks, and security cameras. It must respond to user commands through a mobile app and operate continuously with minimal power consumption. Should this system be designed around a microcontroller or a microprocessor? Justify your answer based on processing complexity, integration requirements, power efficiency, and cost considerations.

Question 3 [1+1+2 Points]

a) Define the Memory Address Register (MAR) and explain its purpose during a memory access operation.
b) Why is the control bus typically more complex and carries more signal types compared to the address and data buses?
c) Define what is meant by "volatile memory" and "non-volatile memory," and explain which type should store the BIOS program and why.

Question 4 [3 Points]

Describe the roles of the Arithmetic/Logic Unit (ALU) and the Control Unit within the CPU, and explain how they work together during instruction execution.