BRAC UNIVERSITY

Department of Computer Science and Engineering

Examination: Quiz 3 **Duration: 30 min**
Semester : Fall 2023 **Full Marks: 15**

CSE 461: Introduction to Robotics (Section 6)

Suppose your ID is 19 70 43 91 and Section is 06. Take every 2 digit of your ID and your section and sort them in a descending order such that:

A = 91, B = 70, C = 43, D = 19, E = 06

Now, suppose you are a control systems engineer tasked with designing a control system for a motor.
The motor is set to maintain a speed of Z = (A-B) rad/s.
After switching on, you observed that the motor reaches a speed of:
(0.1 * Z) after E seconds
(0.5*Z) after E + E seconds
(0.9*Z) after (D+E) seconds
After reaching the set value, the motor speed initially oscillates and reaches a value of (Z + E) during its first peak after (D + E + E) seconds. Afterwards, the oscillations gradually settle down and the motor reaches within 5% of its final value after (D + E + E + B) seconds and within 2% of its final value after (D + E + E + A) seconds.

1.	**CO2**	a. **Describe** characteristics of a feedback system with block diagrams. .	**4**
		b. **Derive** its Transfer Function.	**3**
		c. **What** are the differences between Closed Loop and Open Loop Control	**2**
		d. **Calculate and Define** the concept of Overshoot, Rise Time and Settling Time with a figure.	**6**