Daffodil International University
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Midterm Examination, Spring 2023
Course Code: CSE426   **Course Title: Principles of Robotics**
Level: 4   Term: 3   Batch: 54

Time: 1.5 Hours   **Full Marks: 25**

Answer all the following questions
[All portions of each question must be answered sequentially]

SL	Questions	Marks	CO
1	In 1921, the term "robot" was first used in a play called "R.U.R." or "Rossum's Universal Robots" by the Czech writer Karel Capek. The plot was simple, man creates a robot to replace him and then robot kills man! How can you define a robot? According to laws of robots by Isaac Asimov, explain your opinion on the scenario mentioned above.	[4]	CO1
2	 Picture-01: Agricultural robot We all depend on the agriculture sector for our foods. Lands are decreasing day by day for urbanization. We have to increase our food production to meet our future needs worldwide. In the Picture-01 you can see a robot working through the cornfield. a. Explain the possible tasks performed by the robot in this scenario. b. Identify the sensors that have been used in this robot. c. Write the working principle of any of the two sensors that have been used in this robot.	 [2] [2] [3]	CO1
3	A point $P(x,y,z)^T$ is attached to a frame F_{noa} and is subjected to the flowing transformation find the coordinates of the point that is a rotation of anti-clockwise 90^0 about the y axis, a translation of [7,-5,2] before rotation of 45^0 about the z axis relative to the reference frame. Apply last digit of your student ID as value of x,y,z [Example: if ID is 155-15-9541, then x=5, y=4, z=1]	[7]	CO2
4	Recently a very shocking Earthquake happened in Turkey. Thousands of people died in this tragedy. As a robot engineer you have the responsibility to help in this kind of situation to rescue people. Now, sketch a rescue robot to rescue people and design a block architecture of your robot system and describe each function.	[7]	CO4