National University of Modern Languages, Islamabad

Faculty of Engineering & Computer Science
Department of Software Engineering

First Quiz

BS SE (5th) Evening-SP-2023
Artificial Intelligence
Faculty Name: Farhad Muhammad Riaz

Maximum Time Allowed: 20 minutes **Maximum Points: 05**

Name/Roll Number: _____

Instruction:

- **Please don't write unnecessary information, be specific.**
- **Write your answer within the space you provide.**

QNO1. For vacuum cleaner example discussed in class. What be the possible agent designs for the cases in which clean squares can become dirty and the geography of the environment is unknown? Justify your Answer. **[02]**

If the geography of the environment is unknown, the agent would need to explore the environment instead of simply oscillating back and forth between squares A and B. it would make sense for the agent to learn from its experience in these cases. It could learn the geography of the environment by exploring it, as well as learning which squares it has checked and cleaned so that it may temporarily stop once it has finished checking and cleaning all of them

QNO2. A robot has to deliver identical packages to locations A, B, and C, in an office environment. Assume it starts off holding all three packages. The environment is represented as a grid of squares, some of which are free (so the robot can move into them) and some of which are occupied (by walls, doors, etc.). The robot can move into neighbouring squares, and can pick up and drop packages if they are in the same square as the robot.

a. Formulate this problem as a search problem, specifying the state space, action space, goal test, and cost function. **[03]**

State: {(x, y), delivered A, delivered B, delivered C}
Action space: Move N, Move E, Move S, Move W, Drop A, Drop B, Drop C.
Goal test: {(x, y), del A, del B, del C } = { (any x, any y), 1, 1, 1 }
Cost function: cost of 1 for each action taken.