1. What is “Lady Lovelace’s Objection”? [10]

2. Argue concisely against Lady Lovelace’s Objection. [10]

The next questions are about the game of tic-tac-toe. It is played on a board of 9 squares, divided into 3 rows and 3 columns. Starting with an empty board, the players in alternating turns place a single piece in an empty square. The starting player places X’s, the other player places O’s. The first player to line up 3 of their pieces in a line (horizontal, vertical, or diagonal), wins the game. If no more moves are possible the game ends in a draw.

3. Give the PEAS description for the starting player in tic-tac-toe. [20]

4. How does it differ from the PEAS description of the other player? [5]

5. Classify the tic-tac-toe task environment according to these properties: [5]

   - Fully observable/partially observable
   - Deterministic/stochastic
   - Episodic/sequential
   - Static/dynamic/semi-dynamic
   - Discrete/continuous

6. Explain each of your five choices in the previous question. [15]

7. Give the formal problem definition of tic-tac-toe in terms of:

   - states [5]
   - initial state [5]
   - successor function [5]
   - goal test [5]
   - path cost [5]

8. Draw the “complete partial” state space for tic-tac-toe, starting with the following state: [10]

   | X | O | O |
   |---------|
   | O | X |
   | X |   |