National University of Computer & Emerging Sciences
Artificial Intelligence (CS401)
Class Activity #1

Dated: February 02, 2017 Marks: 40
Time: 30 min. Std-ID: __SOL_____

Question No. 1 Match the most appropriate values from the two columns. [1x10]

Column A	Column B
1. Percept Sequence	a. Goal Based agent (7)
2. Agent	b. Limited intelligence (6)
3. Sensors	c. Percept Input (3)
4. Feedback based action selections	d. Predicate algebra (5)
5. First-order logic	e. World is indivisible (9)
6. Simple reflexive agent	f. History of Percept's of an agent (1)
7. Agent has an objective function	g. Agent Knows how the world evolve (10)
8. Actuators	h. Learning agent (4)
9. Atomic Representation	i. Architecture + Program (2)
10. Model Based Agent	j. Agents response to environment (8)

Question No. 2 Consider an intelligent activity of an agent as describe in the following task environment and give PEAS description? [2x5]

"A golf playing agent"

Performance measure	Golfer's performance on a hole in relation to the hole's par
Environment	Golf field or artificially created arena for golf playing
Sensors	Camera to spot the next hole to put, sonar can be used to measure the distance and obstacles in the field. etc
Actuators	Legs to move and hands to swing the club to hit the ball.

Question No. 3 Intelligence

a. "Surely computers cannot be intelligent—they can do only what their programmers tell them." Is the latter statement true, and does it imply the former? Where do you place learning agent if your support the statement? Give an example argument to justify your thought? [5]

Programmers can give programs the ability to learn using learning rules. The programmer does not tell the computer exactly what to do in every situation and thus can be surprised by what a computer does in some situations. This disconnects the first statement from the second. It was not attempted and probably not useful to argue about whether computers are intelligent or not once the statements are disconnected.

b. What are the two component in a Learning Agent that are essential for exhibiting autonomous functionality? How their interaction works? [5]

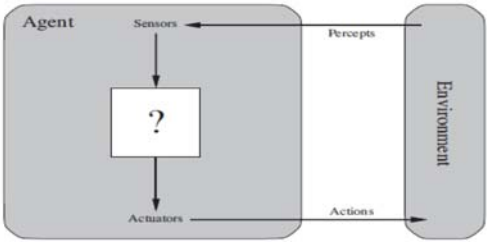
Learning agent can be divided into four conceptual components, these are (i) performance element (ii) learning element (iii) critic and (iv) problem generator. The most important distinction is between the learning element, which is responsible for making improvements, and the performance element, which is responsible for selecting external actions, working together these components exhibits autonomous functionality.
The performance element is what we have previously considered to be the entire agent: it takes in percepts and decides on actions. The learning element uses feedback from the critic on how the agent is doing and determines how the performance element should be modified to do better in the future.

Question No. 4 Intelligent Agents

a. A Coal Mine watchman agent has four sensors S1, S2, S3 and S4, with possible values for 3,2,4,2 respectively for each sensor. If we want to build a Reflexive Agent for it, what will be the distinct values for possible percepts? [5]

There will be 3 X 2 X 4 X 2 = 48 distinct percents values from the environment, a simple reflexive agent will need to fill the action sequences for all such percepts. This will be a limited percept and action pairs of activity for agent.

<S1S2S3S4>->Action (i)



Percept -

S1XS2XS3XS4=48

b. Compare and Contrast. [5]

Simple Reflexive Agent	Model Based Agent
Simple reflex agents respond directly to percepts	Model-based reflex agents maintain internal state to track aspects of the world that are not evident in the current percept.
It has limited intelligence	It is more responsive
It has well define sequence of action	The sequence of action is based on internal state from the model.