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

Dated: February 13, 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]

"Autonomous MARS Rover"

Performance measure	How good it explore, collect, analyze, and report samples from MARS?
Environment	MARS land or simulated arena
Sensors	Video cameras, sonars, audio receivers, communication links, etc
Actuators	Legs/wheels and arms for movement and collection of samples, communication channel, sample analysis lab, etc

Question No. 3 Intelligence

a. Describe Turing Test. Which school of AI its belong to? What are its limitation? [5]

The Turing Test, proposed by Alan Turing (1950), a computer passes the test if a human interrogator, after posing some written questions, cannot tell whether the written responses come from a person or from a computer. Turing test fail to incorporate any rigor cognition to the test process. The Chinese room is a thought experiment presented by the philosopher John Searle to challenge the claim that it is possible for a computer running a program to have a "mind" and "consciousness" together.

b. Why Rational Action approach to AI is progressive in solving a lot of practical problem? Justify your answer. [5]

Rational Action approach to AI only concerned about performing action that suits to the situation. Rational Agent - Agent acts intelligently, given a set of beliefs and goals, agent performs appropriate actions to achieve those goals. This is obviously simple than all approach to AI and transforming agent in a lot of different environment is possible under this approach.

Question No. 4 Intelligent Agents

a. What are the pros and cons of a Model Based Agent? [5]

Model based reflex agents are made to deal with partial observations in the environment. It keeps tracks of changing/hidden aspect of environment from past interactions as an internal state or model. This can be very helpful in deciding rational actions in a lot of complex environments.

There are two possible drawbacks in Model based reflexive agents, first they have often no exact information about the environment thus they do guess or sometime guesses. Secondly, they also need information about their own actions and how these actions affect the environment.

b. Compare and Contrast. [5]

Utility Based Agent	Goal Based Agent
A utility-based agent is a kind of goal-based agent. It uses a model of the world, along with a utility function that measures its preferences among states of the world. Then it chooses the action that leads to the best expected utility, where expected utility is computed by averaging over all possible outcome states, weighted by the probability of the outcome. Hence it can differentiate between best action sequences to attain a goal.	A goal-based agent is a kind of model based agent. It keeps track of the world state as well as a set of goals it is trying to achieve, and chooses an action that will (eventually) lead to the achievement of its goals. A goal based agent in fact only distinguish between goal and non-goal states, and try to apply sequence of actions to attain the goal, it would not ensure that the goal should be attain with the optimal cost.