Short Answer Type Questions

1. What do you mean by rational agent? **[WBUT 2007]**

Answer:

A **rational agent** is an agent which has preferences, models uncertainty via expected values, and always chooses to perform the action that results in the optimal outcome for itself from among all feasible actions. A rational agent can be anything that makes decisions, typically a person, firm, machine, or software.

The action a rational agent takes depends on:

- the preferences of the agent
- the agent's information of its environment, which may come from past experiences
- the actions, duties and obligations available to the agent
- the estimated or actual benefits and the chances of success of the actions.

2. a) What is perception? **[WBUT 2008]**

Answer:

In perception the environment is scanned by means of various sensory organs, real or artificial, and the scene is decomposed into separate objects in various spatial relationships.

b) Define intelligent agent. **[WBUT 2008]**

OR,

What is an agent? **[WBUT 2011]**

Explain different types of environment related to intelligent agent. **[WBUT 2008]**

OR,

What is an agent? Describe various agent types. **[WBUT 2016]**

Answer:

Intelligent Agent:

- ***social***: agents should be able to interact, when they deem appropriate, with o artificial agents and humans in order to complete their own problem solving an help others with their activities.

Intelligent agents are usually classified into five classes based on their degree perceived intelligence and capability:

1. simple reflex agents
2. model-based reflex agents
3. goal-based agents
4. utility-based agents
5. learning agents.

The environment can be classified into the following:

Accessible* vs. *inaccessible

An accessible environment is one in which the agent can obtain complete, accurate, u to-date information about the environment's state. Most moderately compl environments (including, for example, the everyday physical world and the Internet) a inaccessible. The more accessible an environment is, the simpler it is to build agents operate in it.

Deterministic* vs. *non-deterministic

As we have already mentioned, a deterministic environment is one in which any actio has a single guaranteed effect. The physical world can to all intents and purposes b regarded as non-deterministic. Non-deterministic environments present greater problem for the agent designer.

Episodic* vs. *non-episodic

In an episodic environment, the performance of an agent is dependent on a number o discrete episodes, with no link between the performance of an agent in differen scenarios. Episodic environments are simpler from the agent developer's perspective because the agent can decide what action to perform based only on the current episode - it need not reason about the interactions between this and future episodes.

Static* vs. *dynamic

A static environment is one that can be assumed to remain unchanged except by the performance of actions by the agent. A dynamic environment is one that has other processes operating on it, and which hence changes in ways beyond the agent's control. The physical world is a highly dynamic environment.

Discrete* vs. *continuous

An environment is discrete if there are a fixed, finite number of actions and percepts in it Russell and Norvig give a chess game as an example of a discrete environment, and taxi driving as an example of a continuous one.

3. What are the disadvantages of table driven agent? **[WBUT 2011]**

Answer:

Disadvantages of Table driven agent

1. The table needed for something as simple as an agent that can only play chess would be about 3510° entries.

2. It would take quite a long time for the designer to build the table.
3. The agent has no autonomy at all, because the calculation of best actions is entirely built in.
   So if the environment changed in some unexpected way, the agent would be lost.
4. Even if we gave the agent a learning mechanism as well, so that it could have a degree of autonomy, it would take forever to learn the right value for all the table entries.

4. a) What is percept sequence? **[WBUT 2016]**
b) What is agent system?

Answer:

a) A percept is an input that an intelligent agent receives at a given moment. The **percept sequence** is the complete history of every and any percept that has been received. Importantly, a rational agent's choice of action can only depend on its percept sequence and - conversely - not on anything it hasn't perceived.

b) Multi-agent systems consist of agents and their environment. A multi-agent system is a computerized system composed of multiple interacting intelligent agents within an environment. Multi-agent systems can be used to solve problems that are difficult or impossible for an individual agent or a monolithic system to solve.

Long Answer Type Questions

1. Discuss on 'agents as search procedure'. **[WBUT 2011]**

Answer:

This notion of search is computation inside the agent. It is different from searching in the world, when it may have to act in the world, for example, an agent searching for its keys, lifting up cushions, and so on. It is also different from searching the web, which involves searching for information. Searching in this chapter means searching in an internal representation for a path to a goal.

The idea of search is straightforward: the agent constructs a set of potential partial solutions to a problem that can be checked to see if they truly are solutions or if they could lead to solutions. Search proceeds by repeatedly selecting a partial solution, stopping if it is a path to a goal, and otherwise extending it by one more arc in all possible ways. When an agent is given a problem, it is usually given only a description that lets it recognize a solution, not an algorithm to solve it. It has to search for a solution.

2. Write short note on Intelligent Agents. **[WBUT 2006, 2013]**

Answer:

Refer to Question No. 2(b) of Short Answer Type Questions.