

1. Represent the PEAS table for Taxidriver and Medical Diagnosis System.

Agent	Performance Measure	Environment	Actuators	Sensors
Taxidriver	safe, fast, comfortable	roads, other traffic, pedestrians, customers	steering, accelerator, brake, signal, horn,	camera, sonar, speedometer, GPS, odometer,
Medical Diagnosis System.	healthy patient, minimize costs, lawsuits	patient, hospital, staff	display questions, tests, diagnosis, treatments,	keyboard entry of symptoms, findings, patient's answers

2. List the various types of searching available in AI

Uninformed searching

1. Breadth first search
2. Depth first search
3. Brute force or blind search
4. Greedy search

Informed searching or Heuristic search

1. Best first search
2. Branch and Bound Search
3. A* Search
4. AO* Search
5. Hill Climbing
6. Constraint satisfaction
7. Means end analysis

3. Write a note on Agent Function.

A simple agent program can be defined mathematically as an agent function which maps every possible percept sequence to a possible action the agent can perform or to a coefficient, feedback element, function or constant that affects eventual actions:

$$f:P^* \rightarrow A$$

Agent function is an abstract concept as it could incorporate various principles of decision making like calculation of utility of individual options, deduction over logic rules, fuzzy logic, etc.

4. List out the part of representation of AI.

The representation of AI problems can be covered in following four parts:

- ✓ **A lexical part:** that determines which symbols are allowed in the representations of the problem. Like the normal meaning of the lexicon, this part abstracts all fundamental features of the problem.
- ✓ **A structural part:** that describes constraints on how the symbols can be

arranged. This corresponds to finding out possibilities required for joining these symbols and generating higher structural unit.

- ✓ **A procedural part:** that specifies access procedures that enable to create descriptions, to modify them, and to answer questions using them.
- ✓ **A semantic part:** that establishes a way of associating meaning with the descriptions.

5. What is a rule based system

- The rule based system is one that uses several rules as evidences and relates it to a single hypothesis.
- They use the hypothesis and evidences collected by various inferences and function.

6. List the two levels of knowledge representation.

- Propositional logic
- Predicate logic

7. Differentiate universal and existential quantifiers.

Universal quantifier “for all”

- a. The expression is true for every possible value of the variable

Existential quantifier “there exists”

- b. The expression is true for at least one value of the variable

8. When the knowledge is uncertain. How will you handle?

1. Non monotonic logic
2. Probabilistic reasoning
3. Fuzzy logic
4. Truth values.

9. Define plan.

Plan is a way of decomposing a problem into some parts and the various techniques can be applied on it to handle the various interactions as they are detected during the problem solving process.

10. List the Features of ideal planner

- The planner should be able to represent the states, goals, and actions
- The planner should be able to add new actions at any time.
- The planner should be able to use divide and conquer method for solving very big problems

11.State about artificial intelligence.

The exciting new effort making computer for think like machines with mind in full and literal sense. Artificial intelligence systemizes and automates intellectual tasks and is therefore potentially relevant to any sphere of human intellectual activities. The capability of a device to perform functions that is normally associated with human intelligence, such as reasoning and optimization through experience.

12.Define rational agent.

A rational agent is one that does the right thing. Here right thing is one that will cause agent to be more successful. That leaves us with the problem of deciding how and when to evaluate the agent's success.

13. List out some of the applications of Artificial Intelligence.

Some of the applications of Artificial Intelligence are,

- ✓ Autonomous planning and scheduling
- ✓ Game playing
- ✓ Autonomous control
- ✓ Diagnosis
- ✓ Logistics planning
- ✓ Robotic

14. Define Partially Observable environments.

- ✓ An environment might be partially observable because of noisy and inaccurate sensors or because parts of state are simply missing from sensor data for example, a vacuum agent with only a local dirt sensor cannot tell whether there is dirt in other squares, and an automated taxi cannot see what other drivers are thinking.

15. State about production based system

- A production based system is one
- That makes use of the production rules.
- Advantages of production rules:
 - They are modular,
 - Each rule defines a small and independent piece of knowledge.
 - New rules may be added and old ones deleted
 - Rules are usually independently of other rules.

16. Define certainty factor.

A certainty factor $CF(h,e)$ is defined in terms of two components.

- i. $MB(h,e)$ is a measure of belief in hypothesis h given the

✓ If agent has no sensors at all then environment is **unobservable**.
evidence.

- 1. MB measures the extent to which the evidence supports the hypothesis else it is zero if the evidence fails to support the hypothesis.
- ii. $MD(h,e)$ is the measure of disbelief in hypothesis h given the evidence e .
 - 1. MD measures the extent to which the evidence supports the negation else it is zero if the evidence fails to support the hypothesis.
- iii. These two factors define certainty as
 - 1. $CF(h,e) = MB(h,e) - MD(h,e)$

17. Define non-monotonic inference?

Non monotonic inference is one that uses axioms and rules that are expanded so that complete information can be got from incomplete data.

This system preserves the property that, at any instant of time, a statement is either believed to be true or false.

18. When the knowledge is uncertain. How will you handle?

5. Non monotonic logic
6. Probabilistic reasoning
7. Fuzzy logic
8. Truth values.

19. State about planning?

Planning refers to the use of methods that focus on ways of decomposing the original problem into appropriate subparts and on ways of recording and handling interaction among the subparts as they are detected during the problem solving process.

20. Define reactive system.

- A reactive system is one that has access to a knowledge base of some sort that describes the actions to be taken under different circumstances.
- It does not have the power of anticipation.