

Times asked: 6 times

5 times

4 times

3 times

2 times

1 time

indicates 5-mark question

AI Question Bank

1.Introduction to AI

1. Describe four categories of Artificial Intelligence. #

2. Intelligent Agents

1. Explain PEAS descriptor. Also state PEAS description for given object. PYQs:

- Vacuum cleaner robot
- Automobile Driver agent
- Part picking robot
- Medical diagnosis system
- Online English tutor.

2. Explain Problem formulation, also give the initial state, goal test, successor function, and cost function for the following. Choose the formulation that is precise enough to be implemented. PYQs:

- Problem Statement: Autonomous Taxi driver
- Wumpus world problem
- Problem statement: A 3-foot-tall monkey is in a room where some bananas are suspended from the 8-foot-tall ceiling. He would like to get bananas. The room contains two stackable, movable, climbable 3-foot-high crates.
- Formulate the 8-puzzle problem. #

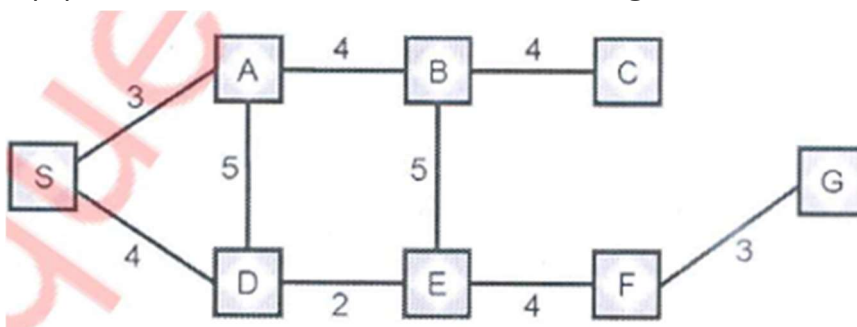
3. List down all agent types. Explain each with block diagram.

3. Problem Solving

1. Explain hill climbing algorithm and problems that occur in hill climbing algorithm along with solutions.

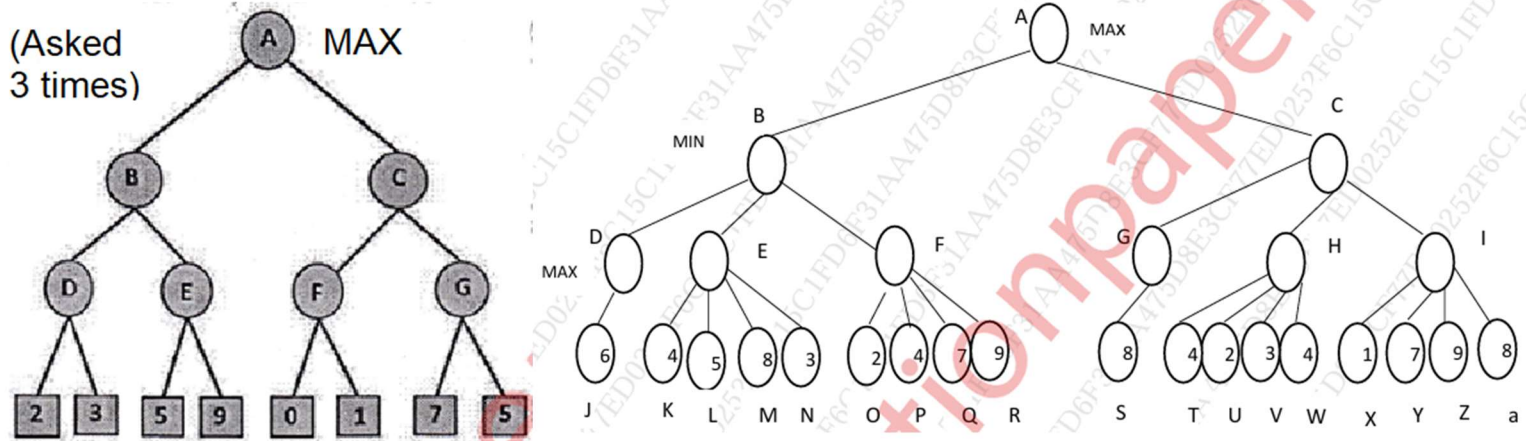
2. Apply A* algorithm on a given graph.

PYQ: Heuristic values are $h(S)=15$, $h(A)=14$, $h(D)=12$, $h(B)=10$, $h(E)=10$, $h(C)=8$, $h(F)=10$, $h(G)=0$. S is the start node and G is the goal node.



(Asked twice)

3. Apply alpha beta pruning on given graph, PYQs:



4. Explain alpha beta search in detail with example.
5. Differentiate between Informed search and Uninformed search algorithms.
6. Explain the Depth Limited search and Depth first iterative deepening search.
7. Explain Simulated annealing with suitable example.

4. Knowledge and Reasoning

1. Explain forward-chaining and backward-chaining algorithm in detail with suitable example.
2. Write a detailed note on Wumpus world environment.
3. Solve given problem using Resolution:

- i. Consider the following statements: (asked twice)
 - a) All people who are graduating are happy
 - b) All happy people smile
 - c) Someone is graduating

Represent above statements in FOL, Convert each to CNF, Prove that “someone is smiling” using resolution. Draw the resolution tree.

- ii. What actions would you take to prove “Some who are intelligent can’t read” using propositional logic:
 - a) Whoever can read is literate
 - b) Dolphins are not literate
 - c) Some dolphins are intelligent

- iii. Consider the following facts:
 - a) Steve only likes easy courses.
 - b) Science courses are hard.
 - c) All the courses in the basket _ weaving department are easy.
 - d) BK301 is a basket _ weaving course.

Find by resolution that “What course would Steve like?”

5. Planning and Learning

1. What is planning in AI? Explain Partial-order planning with suitable example.
2. Problem on planning, PYQs:
 - i. Design a planning problem using STRIP for Air cargo transport. It involves loading and unloading cargo onto and off of planes and flying it from place.
Initial state: At SFO airport, Cargo1, Plane1 and at JFK airport, Cargo2, Plane2 is present.
Goal state: At SFO airport Cargo2 and at JFK airport Cargo1 is present.
 - ii. Consider problem of changing a flat tire. The goal is to have a good spare tire properly mounted on to the car's axle, where the initial state has a flat tire on the axle and a good spare tire in the trunk. Give the ADL description for the problem and also discuss the solution.
3. Explain the concept of PAC learning.
4. Explain Reinforcement learning in detail.
5. Explain hierarchical planning in detail. #

6. AI Applications

1. Explain different applications of AI in Robotics, Healthcare, Retail and Banking.
2. Write detailed note on: Language models of Natural Language Processing.
3. Give types of parsing and generate the parse tree for the sentence "The cat ate the fish." #

	1	2	3	4	5	6
2024 Dec	5	20	30	30	30	20
2024 May	0	20	35	45	20	10
2023 Dec	5	20	30	40	20	20
2023 May	5	20	55	25	10	10
2022 Dec	5	25	40	20	30	20
Last 5 Avg	5	20	35-40	30	20-30	10-20
*2022 May	0	10	35	25	15	10
Total	20	115	225	185	125	90

Asked once:

indicates 5-mark question

1.Introduction to AI

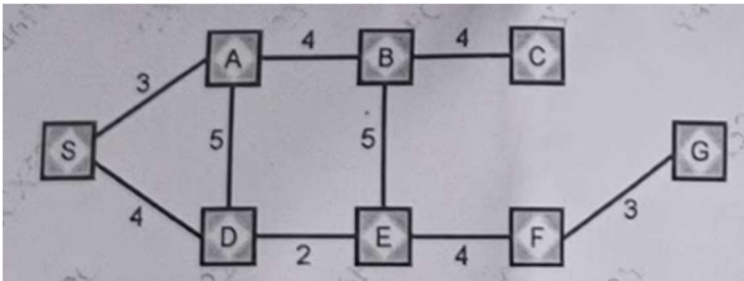
1. What do you mean by Total Turing test. #

2. Intelligent Agents

1. Explain various properties of Task environment with suitable examples.
2. Describe different types of environment of AI agents. #
3. What do you mean by state space representation? Explain with example the necessity of it. #

3. Problem Solving

1. Apply greedy best-first search. At each iteration, each node is expanded using evaluation function $f(n) = h(n)$. $h(S)=10$, $h(A)=10$, $h(D)=8$, $h(B)=6$, $h(E)=6.5$, $h(C)=4$, $h(F)=3$, $h(G)=0$. S is the start state and G is goal state.



2. What is Game playing algorithm? Draw a game tree for Tic-Tac-Toe problem.
3. What do you understand by Min Max Search? Explain in detail with example. #
4. What do you understand by informed and uninformed search methods? Explain in detail with example.
5. Explain the concept of genetic programming.

4. Knowledge and Reasoning

1. Explain different quantifiers with example. #
2. What do you mean by Resolution? Also discuss the steps in Resolution.
3. Define Belief network. Describe the steps of constructing belief network with an example.
4. Explain various methods of knowledge representation.
5. Compare and contrast propositional logic and first order logic. #
6. Write a short note on conditional probability and its role in AI. #

5. Planning and Learning

1. Explain the concept of Conditional order planning. #
2. Compare the importance of Partial order planning over Total order planning. #
3. What data is used to evaluate award and punishment of robot navigation. #
4. Explain the concept of Supervised learning. #

6. AI Applications