

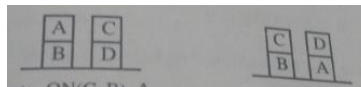
AI&R

Question Bank Unit 1

1. Define Artificial Intelligence. Explain typical applications of AI.
2. Before we can solve a problem using state space search we must define an appropriate state space. For 8 puzzle problem and Tower of Hanoi find a good state space representation.
3. Explain in detail
 - a) Depth Bounded DFS
 - b) Depth First Iterative Deepening search.
4. Define and explain Heuristic function with an example.
5. Explain A* algorithm and detail how Best First Search is different from A*.
6. Explain in detail
 - a) Iterative Deepening A*
 - b) Recursive Best First Search
7. Write a short note on Beam search and Tabu search.
8. Explain in detail Hill climbing algorithm and list its limitations.
9. Write a note on Steepest Ascent Hill Climbing.
10. Detail the strategy of Pruning the CLOSED and OPEN lists for different set of algorithms.

Question Bank Unit 2

1. Define Production system .List the characteristics of problem.
2. What is Problem reduction or problem decomposition? Define Goal trees (AND-OR graph).
3. Explain AO* algorithm in detail.
4. What is Rule Based Expert system? Detail it with an example (MYCIN)
5. Write a detailed note on STRIPS planning language.
6. Consider the following blocks world problem



start: $ON(A,B) \wedge$
 $ON(C,D) \wedge$
 $ONTABLE(B) \wedge$
 $ONTABLE(D) \wedge$
 $ARMEMPTY$

goal: $ON(C,B) \wedge$
 $ON(D,A) \wedge$
 $ONTABLE(B) \wedge$
 $ONTABLE(A)$

- a) Show how STRIPS would solve this problem.
- b) Show how TWEAK would solve this problem.

7. Explain in detail Forward and Backward state space planning.
8. Explain in detail Goal stack planning with an example.
9. Define Planning. What are the components of planning system?
10. What is Plan space planning and list different algorithms under plan space planning.
11. Explain Nonlinear planning under constraint posting (TWEAK)
12. Define constraint satisfaction problem. Explain it for an n queens problem.
13. Trace the constraint satisfaction procedure solving the following crypt arithmetic problem:
CROSS
+ROADS

DANGER
14. Explain the concept of constraint propagation and forward checking in detail.
15. Explain in detail Backtracking and look ahead strategies in CSP.
16. Explain Waltz algorithm in detail (line labeling).
17. Explain the concept of Scene Labeling.
18. Explain in detail the concept of Higher order and Directional Consistencies in CSP.

Question Bank Unit 3

1. What is Knowledge Based Agent? Explain The Wumpus World (game) task environment.
2. Define the terms Logic and Logical Agents.
3. Explain the syntax and semantics of propositional logic with examples.
4. Explain the inference process in proposition logic with example.
5. Define the terms a) Horn clause b) Clause form c) Resolution
6. List the properties of a good system for representation of Knowledge.
7. Explain in detail Unification Algorithm (propositional logic) with an example.
8. Explain in detail Resolution algorithm (predicate logic) with an example.
9. What is Unification and lifting?
10. Explain the concept of Forward and Backward chaining.
11. Explain the syntax and semantics of First order logic.
12. Define Intelligent agent and what is an agent function.

13. Explain in detail with an example Weak slot filler structures [Semantic net and Frames] .
14. Explain in detail with an example Strong slot filler structures [Conceptual dependency and Scripts]
15. Construct semantic net representations for the following:
 - a) Pompeian (Marcus), Blacksmith (Marcus)
 - b) Mary gave the green flowered vase to her favorite cousin.
16. Construct partitioned semantic net representation for the following:
 - a) Every batter hit a ball.
 - b) All the batters like the pitcher.
17. Show a conceptual dependency representation of the sentence

John begged Mary for a pencil
18. Write a short note on Second order logic.

Text Books:

1. Deepak Khemani, “A First Course in Artificial Intelligence”, McGraw Hill Education(India), 2013, ISBN : 978-1-25-902998-1
2. Elaine Rich, Kevin Knight and Nair, “Artificial Intelligence”, TMH, ISBN-978-0-07-008770-5
3. Stuart Russell and Peter Norvig, “Artificial Intelligence: A Modern Approach”, Third edition, Pearson, 2003, ISBN :10: 0136042597

Prepared by
Archana Kollu
DIT, Pimpri, Pune.