

CBCS SCHEME



21AI54

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025

Principles of Artificial Intelligence

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are the four categories used to define Artificial Intelligence. Briefly explain each of them. (10 Marks)
- b. What is an agent? How agent interacts with environment? Give few examples for agents. (05 Marks)
- c. Write the PEAS description for automated taxi agent. (05 Marks)

OR

- 2 a. What is an intelligent agent? What are the different types of intelligent agent? Briefly explain each of them. (10 Marks)
- b. Classify the environments based on their properties and characteristics. Briefly explain any five environments. (10 Marks)

Module-2

- 3 a. Define problem-solving agent. What is the primary objective of the problem-solving agents? (07 Marks)
- b. Draw solution for vacuum cleaner world using state transition diagram. (07 Marks)
- c. Write the general description of graph-search algorithms. (06 Marks)

OR

- 4 a. Explain any four uninformed search strategies provide examples to each of them. (10 Marks)
- b. Write all the states of the tree to find out the path for the following Depth-First-Search tree with the initial node A and goal node M. [Refer Fig.Q4(b)]

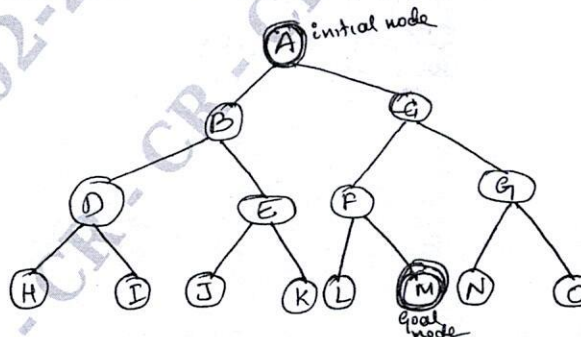


Fig.Q4(b)

(05 Marks)

- c. Define infrastructures of search algorithms and also explain how to evaluate the performance of search algorithms. (05 Marks)

Module-3

- 5 a. Define Heuristic search strategies. Explain A* search with suitable example. (08 Marks)
 b. Explain Greedy Breadth First search, with an example. (08 Marks)
 c. Explain heuristic function with respect to 8-puzzle problem. (04 Marks)

OR

- 6 a. Define the following :
 (i) Knowledge base (ii) Knowledge base agents (iii) Levels of knowledge base agents. (07 Marks)
 b. Write the PEAS description for WUMPUS world task environment. (07 Marks)
 c. Define the following propositional logic:
 (i) Syntax (ii) Semantics (06 Marks)

Module-4

- 7 a. Explain the symbols and interpretations of First Order Logic. (06 Marks)
 b. Explain the following with respect to first order logic:
 (i) Terms (ii) Atomic sentences (iii) Complex sentences (iv) Qualifiers (10 Marks)
 c. Define the sets, numbers and list with respect to first order logic. (04 Marks)

OR

- 8 a. Explain the inference rule for qualifiers of inference in first order logic. (05 Marks)
 b. Define Unification and Lifting (08 Marks)
 c. Explain forward and backward chaining with example. (07 Marks)

Module-5

- 9 a. Explain how the agent acting under uncertainty? Explain uncertainty for dental patient toothache diagnosis problem. (10 Marks)
 b. Discuss how uncertainty is modeled in WUMPUS world and how probabilistic reasoning enhances the decision making in such environments. (10 Marks)

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- 10 a. State Baye's rule. Write the Baye's rule for multivalued variable. (05 Marks)
 b. Explain agents use the basic probability notations to handle uncertainty. (05 Marks)
 c. Briefly explain Full Joint Distribution. (05 Marks)
 d. With an example explain the events that are independent on probability calculations. (05 Marks)

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