

MSc AIML Sem.-1 Examination
Artificial Intelligence
January-2025

Time : 3-00 Hours]

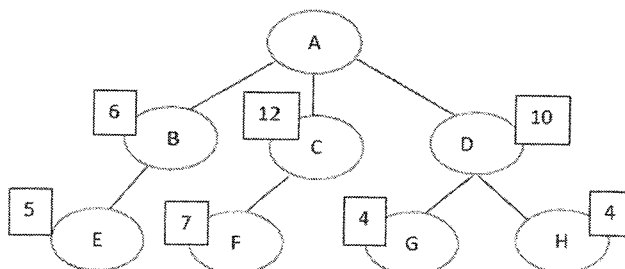
[Max. Marks : 100

Instructions:

- Write both the Sections in the separate answer book.
- Both Sections having equal weightage.
- Draw Diagrams wherever necessary.
- Make Assumptions wherever necessary.

Section – I

- Q.1 Answer the following questions (**any ten**): [20]
- I. Write two definitions of Artificial Intelligence.
 - II. Define: Problem – Solving agent.
 - III. Define: Rational agent.
 - IV. What are Sensors, Actuators and Effectors.
 - V. Explain Local Maxima?
 - VI. Draw the setup of Tuning Test.
 - VII. What is AI technique?
 - VIII. List the Task domain of Artificial Intelligence.
 - IX. What is the difference between Agents and Environment.
 - X. What is the role of Heuristic in searching?
 - XI. Write the two applications of AI with example.
- Q.2 Answer the following questions in brief (**any four**): [20]
- a. Explain environment types (nature of environment) for Travelling Sales Man Problem.
 - b. Write the algorithm of strategy – 2 for Tic – Tac – Toe.
 - c.



Solve the following tree using A* algorithm.

- d. Evaluate 7 – Problem characteristic of 8 – queen problem.
- e. Write the algorithm of DFS and explain it with the help of example.

- Q.3 Write the case study of 8 – queen problem in detail. [10]
OR
 Q.3 Write the algorithm of Tic – Tac – Toe by strategy – 2' in detail. [10]

Section – II

- Q.4 Answer the following questions in detail (any five): [30]
- I. Explain the Steepest – Ascent hill climbing technique with a proper example.
 - II. Explain Alpha – Beta pruning method with the help of an example.
 - III. Write the algorithm for heuristic of 8 – puzzle problem.
 - IV. Explain the Iterative Deepening A* algorithm with an example.
 - V. What is Expert system? Where are they used? Explain each component of Expert systems.
 - VI. Difference between Forward and Backward reasoning with appropriate example.
- Q.5 Do as directed: [20]
- a. Represent the sentence using Semantic nets.
 - John sits on a brown desk in the library.
 - John watched a comedy movie with Lee in multiplex.
 - b. Represent the sentence using Conceptual Dependency.
 - Suraj ate manchurian noodles with a fork.
 - Pony will eat salad with chopsticks.
 - c. Represent the sentence into First – order Predicate Logic.
 - All professors consider the dean friend or don't know him.
 - Jack went to school and brought Maggie in lunch box.

OR

- Q.5 Do as directed: [20]
- a. Consider the following sentence:
 - i. Everyone who loves all animal is loved by someone.
 - ii. Nobody loves those who kill an animal.
 - iii. Ben loves all animal.
 - iv. Either Ben or Addy killed Pussy.
 - v. Addy is friend of Ketty.
 - vi. Pussy is white little cat of Ketty.
 1. Translate these sentences into formulas in predicate logic.
 2. Find “Did Ben kill Pussy?” using Backward Chaining.