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Reg. No. | | | | | | | | |

II Semester M.C.A. Degree Examination, November/December - 2025

COMPUTER SCIENCE

Artificial Intelligence

(CBCS Scheme 2020-21)

Paper : 2MCA6

Time : 3 Hours **Maximum Marks : 70**

***Instructions to Candidates* :**

Answer any Five questions from Part-A and Four questions from Part-B.

PART - A

I. Answer any Five questions. Each question carries 6 marks. **(5×6=30)**

1. Explain the differences between Natural Intelligence and Artificial Intelligence.
2. How a problem is formally defined? List down the components of it.
3. Explain alpha-beta pruning algorithm with example.
4. Explain the A* search and give the proof of optimality of A*.
5. Consider the following sentences :

   John likes all kinds of food, Apples are food, Chicken is food,

   Anything anyone eats and isn't killed by is food

   Bill eats peanuts and is still alive

   Sue eats everything bill eats

   a) Translate these sentences into formulas in predicate logic

   b) Prove that John likes peanuts using backward chaining

   c) Convert the formulas of a part into clause form

   d) Prove that John likes peanuts using resolution
6. Consider the following set of axioms

   a) Everyone who loves someone who loves them back is happy

   b) Mary loves everyone

   c) There is someone who loves Mary

   From the above statements conclude that: Mary is happy.

[P.T.O.

7. Given the following initial and the goal state for the Blocks world problem.
Construct a set of operators (Rules) and hence generate a plan to reach the goal state from the initial state.
Initial state: ontable(A) $\wedge$ ontable(B) $\wedge$ on(C, B) $\wedge$ clear(A)
Goal State: ontable(B) $\wedge$ on(C, B) $\wedge$ on(A, C) $\wedge$ clear(A)
Where ontable(x): block x is on top of the table on(x,y): block x is on top of block y clear(x): there is nothing on top of block x; therefore it can be picked up hand empty: you are not holding any block.

8. Define Natural Language Processing. Discuss the syntactic processing of the NLP with an example.

PART - B

II. Answer any Four questions. Each question carries 10 marks. **(4×10=40)**

9. a) Discuss various approaches and issues in knowledge representation. Also discuss various Problems in representing knowledge,
b) Write unification algorithm and explain resolution in predicate logic

10. What is Learning? discuss different types of Learning. Explain various approaches in Explanation based Learning.

11. Generate the Parse tree for the following sentences :
a) Piyush wanted to go to the Market with Adarsh
b) I heard the story listing to the radio
c) I heard the kids listening to the radio.
d) All books and magazines that deal with controversial topics have been removed from the syllabus.
e) India will be superpower by the year 2040.

12. What is Semantic Net representation of Knowledge? construct a semantic net representation for the following :
a) Every batter hit a ball
b) All the batters like the pitcher.

13. a) Explain Non- Monotonic reasoning and discuss. Various logic associated with it.
b) What is ensemble learning? Explain briefly the ensemble techniques.

14. **Write a short note on**
a) Expert systems
b) Knowledge Acquisition