

Time: (2½ Hours)

[Total Marks: 75]

N. B.: (1) **All** questions are **compulsory**.

(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.

(3) Answers to the **same question** must be **written together**.

(4) Numbers to the **right** indicate **marks**.

(5) Draw **neat labeled diagrams** wherever **necessary**.

(6) Use of **Non-programmable** calculators is **allowed**.

Q1. Attempt **any three** of the following:

15 Marks

- What is artificial intelligence? Define AI in four Quadrants.
- Write a brief note on foundations of AI.
- What is PEAS? State the PEAS description for Automated Car Driving agent.
- Explain in detail model based agent.
- Describe the structure of the Intelligent agent.
- Explain any two types or properties of the task environment.

Q2. Attempt **any three** of the following:

15 Marks

- Demonstrate problem formulation in 8 queen problem.
- Explain Depth first search algorithm with example.
- Illustrate with the example A* algorithm.
- Describe the Hill climbing algorithm in detail.
- Discuss the mechanism of Genetic algorithm.
- For the vacuum world problem, Write states, Initial States, Actions, Transition model, Path cost and Goal test.

Q3. Attempt **any three** of the following:

15 Marks

- Explain with example Minimax algorithm.
- Write a brief note on Kriegspiel: Partially Observable Chess.
- Explain the Wumpus world in detail.
- Discuss the concept of Propositional logic with examples.
- Describe the working of knowledge-based agent with diagram.
- What is hill climbing algorithm?

Q4. Attempt **any three** of the following:

15 Marks

- Explain Syntax and semantics of First-Order Logic along with examples.
- Illustrate the meaning of atomic & complex sentences w.r.t. FOL.
- What do you mean by Universal Quantifier & Existential quantifier?
- Convert the following sentences into predicate form:
 - Virat is software engineer.
 - All vehicles have wheels

- iii) Some-one speaks some language in this class.
- iv) Everybody loves somebody sometime.
- v) All software engineer develops software.
- e. Differentiate between Forward Chaining Vs. Backward Chaining.
- f. Explain Conjunctive Normal Form (CNF) in First-Order logic.

Q5. Attempt any three of the following:

15 Marks

- a. Write a short note on conditional planning or contingency planning.
- b. What are various Classical Planning Approaches?
- c. Explain briefly about internet shopping world.
- d. Write a brief note on Mental Events.
- e. Explain the concept of Hierarchical Planning.
- f. What are semantic networks?
