

(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**.

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

15

- What is Artificial Intelligence? State its applications
- Discuss Turing test with Artificial Intelligence approach.
- What are agents? Explain how they interact with environment.
- What is rational agent? Discuss in brief about rationality.
- Explain PEAS description of task environment for automated taxi.
- Give comparison between Full observable and partially observable agent.

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

15

- Discuss in brief the formulation of single state problem.
- Give the outline of Breadth First Search algorithm.
- Give the outline of tree search algorithm.
- Explain the mechanism of genetic algorithm.
- Explain how transition model is used for sensing in vacuum cleaner problem.
- Give the illustration of 8 queen problem using hill climbing algorithm.

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

15

- Explain the working mechanism of min-max algorithm.
- Explain in brief about resolution theorem.
- Write a note on Kriegspiel's Partially observable chess.
- Explain in brief about knowledge base agent.
- Explain the syntax for propositional logic.
- Write a note on Wumpus world problem.

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

15

- What is first order logic? Discuss the different elements used in first order logic.
- Explain universal and existential quantifier with suitable example.
- Convert the following natural sentences into FOL form:
  - Virat is cricketer.
  - All batsman are cricketers.
  - Everybody speaks some language
  - Every car has wheel.
  - Everybody loves somebody some time.
- What is knowledge engineering? Write the steps for its execution.
- Give comparison between forward chaining and backward chaining
- Explain in brief about unification.

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

15

- What is planning? Explain STRIPS operators with suitable example.
- Explain in brief about partially ordered plan.
- Explain in brief about hierarchical planning.
- Write a note on mutex relation.
- What is semantic network? Show the semantic representation with suitable example.
- Write a note on Event calculus.