

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI EXAMINATION – SUMMER 2025****Subject Code:3161608****Date:28-05-2025****Subject Name:Artificial Intelligence****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Discuss various areas where Artificial Intelligence is used.	03
	(b) Differentiate between best first search and breadth first search.	04
	(c) Explain the state space search with the use of 8 puzzle problem.	07
Q.2	(a) Explain: (i) Local maximum (ii) Plateau (iii) Ridge.	03
	(b) Solve and suggest the appropriate strategy for the following water-jug problem. You are given two jugs of capacity having 8 liters and 5 liters. There are no measuring markers on jugs. You have to obtain exact 4 liters of water into 8 liters jug.	04
	(c) What is Hill Climbing algorithm? Discuss the cases where Hill climbing fails.	07
	OR	
	(c) Explain the A* search algorithm using an appropriate example.	07
Q.3	(a) Define Soundness and completeness in propositional logic.	03
	(b) Differentiate forward chaining and backward chaining.	04
	(c) Explain Modes Ponens and Modes Tollens inference rules with an appropriate example.	07
	OR	
Q.3	(a) Explain Unification.	03
	(b) Differentiate declarative and procedural knowledge.	04
	(c) Discuss the different approaches to knowledge representation.	07
Q.4	(a) Explain the concepts of tautology and contradiction in propositional logic with an appropriate example.	03
	(b) Describe the axioms of probability theory.	04
	(c) Translate following sentences to predicate logic and prove that “West is criminal” using resolution.	07
	1. It is a crime for an American to sell weapons to hostile nations.	
	2. All the missiles were sold to Nono by West.	
	3. The country Nono is an enemy of America.	
	4. An enemy of America counts as hostile.	
	5. Nono has some missiles.	
	6. Missiles are weapons.	
	7. West is an American.	
	OR	
Q.4	(a) What is goal stack planning? Give example of initial state and goal state in goal stack planning using some predicates.	03
	(b) Discuss Bayesian network and its application.	04
	(c) Explain minimax procedure for game playing with example.	07

- Q.5** (a) List and state input predicates in turbo prolog. **03**
(b) Write a prolog program to find the factorial of a positive integer number. **04**
(c) Explain CUT, FAIL and REPEAT predicates in PROLOG. **07**
- OR**
- Q.5** (a) Differentiate predicate and fact in Prolog programming. **03**
(b) Write a prolog program to find the sum of first N natural numbers **04**
(c) What is wampus world? Explain in detail. **07**
