

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VI EXAMINATION – SUMMER 2026

Subject Code: 3161608

Date: 29-05-2026

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) Explain limitations of hill climbing method.	03
	(b) Discuss various applications of artificial intelligence.	04
	(c) Explain state space search method using example of water jug problem.	07
Q.2	(a) Explain the concept of heuristic using 8-tile puzzle problem.	03
	(b) Explain the breadth first search algorithm using an appropriate example.	04
	(c) Explain the concept of constraint satisfaction using crypt-arithmetic problem.	07
	OR	
	(c) Explain the A* search algorithm using an appropriate example.	07
Q.3	(a) Differentiate between Forward chaining and Backward chaining.	03
	(b) Explain any two inference rules with an appropriate example.	04
	Explain the concepts WFF (well-formed formulas) and various logical connectives in propositional logic using truth table. Also show example tautology and contradiction in propositional logic.	07
	OR	
Q.3	(a) Differentiate between propositional logic and predicate logic.	03
	(b) Explain the universal and existential quantifiers with an appropriate example.	04
	(c) Explain the concept of resolution in first order predicate logic with an appropriate example.	07
Q.4	(a) Explain the difference between green cut and red cut with example in Prolog.	03
	(b) Explain the expectation-maximization (EM) algorithm with an appropriate example.	04
	(c) Explain the alpha-beta pruning algorithm in game-playing using an appropriate example. Also mention advantages of alpha-beta pruning over min-max algorithm.	07
	OR	
Q.4	(a) Explain the concept of Horn Clause with an appropriate example.	03
	(b) Explain the concept of goal stack planning with an appropriate example.	04

	(c)	Explain inference in Bayesian networks using an appropriate example. Also mention applications of Bayesian networks.	07
Q.5	(a)	Explain inference using full joint distribution in probability with an appropriate example.	03
	(b)	Explain the fail predicate in prolog programming with an example.	04
	(c)	Write a program in prolog to find the Factorial of a given number.	07
OR			
Q.5	(a)	Explain Min-Max algorithm in game playing using an appropriate example.	03
	(b)	Explain Bayes' theorem with an appropriate example.	04
	(c)	Write a program in prolog to find a first, last and n th element of a list.	07
