Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2025

Subject Code:3170716 Date:21-05-2025

Subject Name:Artificial Intelligence

Time:02:30 PM TO 05:00 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)**	What is Artificial Intelligence? List the various applications of Artificial Intelligence.	**03**
	(b)	Differentiate between strong AI and weak AI.	**04**
	(c)	Trace the constraint satisfaction procedure solving the following cryptarithmetic problem. R I N G + D O O R --- B E L L	**07**
Q.2	**(a)**	Explain Hill Climbing method in brief.	**03**
	(b)	Discuss forward reasoning in brief.	**04**
	(c)	What is A* search? Describe the different stages of A* search with an example.	**07**
		OR	
	(c)	Consider 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. • John eats everything Bill eats. (1)Translate these sentences into formulas in predicate logic. (2)Prove that John likes peanuts using Backward chaining.	**07**
Q.3	**(a)**	Differentiate propositional logic and predicate logic.	**03**
	(b)	Explain non-monotonic reasoning in detail.	**04**
	(c)	Explain Minimax search procedure with suitable example.	**07**

OR

Q.3	**(a)**	Describe the steps involved in unification in predicate logic.	**03**
	(b)	Explain expert systems architecture in brief.	**04**
	(c)	State the Bayes' theorem. Illustrate how a Bayesian Network can be used to represent causality relationship among attributes.	**07**
Q.4	**(a)**	Explain Hierarchical planning in brief.	**03**
	(b)	Explain syntax and semantic analysis phases of Natural Language Processing.	**04**
	(c)	Discuss the termination parameters used in genetic algorithms in detail.	**07**

OR

Q.4	**(a)**	What is Natural Language Processing? Discuss applications of NLP in brief.	**03**
	(b)	Discuss goal stack planning in brief.	**04**
	(c)	Explain various genetic operators used in genetic algorithms in brief.	**07**
Q.5	**(a)**	Differentiate between DFS and BFS.	**03**
	(b)	What is Artificial neural network? Explain with example.	**04**
	(c)	Write a prolog program to demonstrate the use of cut and fail predicates.	**07**

OR

Q.5	**(a)**	Differentiating between breadth-first search and best-first search algorithm.	**03**
	(b)	Discuss Hopfield network in brief.	**04**
	(c)	Write a prolog program to find minimum number from the given input list.	**07**