Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2023
Subject Code:3161608   **Date:12-07-2023**
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)**	Define artificial intelligence. List the task domain of artificial intelligence with an example.	**03**
	(b)	Differentiate between best first search and breadth first search.	**04**
	(c)	Explain Alpha-Beta cutoff procedure in game playing with example.	**07**
Q.2	**(a)**	Explain: (i) Local maximum (ii) Plateau (iii) Ridge	**03**
	(b)	Discuss Goal Stack Planning.	**04**
	(c)	Explain AO* algorithm.	**07**
		OR	
	(c)	Explain A* algorithm.	**07**
Q.3	**(a)**	Describe different heuristics for the Blocks world problem.	**03**
	(b)	Differentiate propositional logic and predicate logic.	**04**
	(c)	Solve the following Cryptarithmetic Problem.	**07**

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    SEND
+   MORE
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OR

Q.3	**(a)**	Explain Unification.	**03**
	(b)	Discuss Bay's theorem.	**04**
	(c)	Consider the following sentences:	**07**

   - John likes all kinds of food.
   - Apples are food.
   - Chicken is food.
   - Anything anyone eats and isn't killed by is food.
   - Bill easts peanuts and is still alive.
   - Sue eats everything Bill eats.

   (i)   Translate these sentences into formulas in predicate logic.
   (ii) Prove that John likes peanuts using backward chaining.

Q.4	**(a)**	Explain AND-OR graphs.	**03**
	(b)	Explain depth first search algorithm.	**04**
	(c)	Explain forward and backward reasoning with example.	**07**
		OR	
Q.4	**(a)**	Discuss limitations of Hill climbing search method.	**03**
	(b)	Is the minimax procedure a depth-first or breadth-first search procedure? Explain.	**04**

(c) Discuss the different approaches to knowledge representation. **07**

Q.5 **(a)** Discuss in brief the Hopfield network? **03**
(b) Discuss Bayesian network with and application. **04**
(c) Write following Prolog programs: **07**
    (i) To find the maximum number from the three numbers.
    (ii) To find the average of odd and even elements from a list.

OR

Q.5 **(a)** Differentiate predicate and fact in Prolog programming. **03**
(b) Explain Hierarchical Planning. **04**
(c) Write following Prolog programs: **07**
    (i)   To check whether given string is palindrome or not.
    (ii)   To find the length of a given list.

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