

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VIII EXAMINATION-SUMMER 2023****Subject Code: 2180703****Date: 30/06/2023****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) Discuss Turing Test.	03
	(b) What is Artificial Intelligence? List applications of it.	04
	(c) Explain the State Space with the use of Water Jug Problem.	07
Q.2	(a) Analyze Chess problems with respect to the following problem characteristics:	03
	i. Is the problem decomposable?	
	ii. Can solution step be ignored?	
	iii. Is the good solution absolute or relative	
	(b) Give the difference between BFS and DFS.	04
	(c) Discuss A* algorithm. Give one example where it is suitable to apply	07
	OR	
	(c) Discuss AO* algorithm. Give one example where AO* is suitable to apply.	07
Q.3	(a) Demonstrate briefly the steps to convert given wff into clause form.	03
	(b) Translate following sentences into formulas in Predicate logic	04
	• Tennis is a game.	
	• Chess is a game.	
	• John and Steve are students.	
	• John plays Tennis.	
	(c) Consider the following sentences:	07
	• Raj likes all kinds of food.	
	• Apples are food.	
	• Anything anyone eats and isn't killed by is food.	
	• Sachin eats peanuts and is still alive.	
	• Vinod eats everything Sachin eats.	
	Now, Use resolution to answer the question, "What food does Vinod eat?"	
	OR	
Q.3	(a) Represent following sentence using semantic net: 'Sita gave the pearl garland to Hanuman.'	03
	(b) Explain the Forward and Backward Reasoning.	04
	(c) Translate these sentences into formulas in predicate logic.	07
	1. John likes all kinds of food.	
	2. Apples are food.	
	3. Chicken is food.	
	4. Anything anyone eats and isn't killed-by is food.	
	5. Bill eats peanuts and is still alive. Apply	

6. Sue eats everything Bill eats.
 prove that John likes peanuts using forward chaining as well as backward chaining.

- Q.4** (a) Describe any one conflict resolution approach used in rule based systems. **03**
 (b) Differentiate Fuzzy logic and Crisp logic. **04**
 (c) What is Natural Language Processing? Explain each step of NLP. **07**

OR

- Q.4** (a) Discuss perceptron. **03**
 (b) Explain the Alpha-Beta Cutoffs Procedure in Game Playing. **04**
 (c) Explain connectionist models. What is perceptron? What is concept of back propagation for ANNs? **07**

- Q.5** (a) Define and describe list with an example. **03**
 (b) Explain CUT, FAIL & REPEAT predicates in PROLOG. **04**
 (c) Write a Prolog program to solve Tower of Hanoi problem. **07**

OR

- Q.5** (a) What is Prolog? Explain with example the structure of prolog. **03**
 (b) Write a prolog program to find factorial of a positive integer number. **04**
 (c) Define: Frames. Draw Semantic Net for following statements. a) Every kid likes candy. b) Every school going kid likes candy. **07**
