Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER VIII EXAMINATION- SUMMER 2020

Subject Code: 2180703 Date:26/10/2020

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.**

			MARKS
Q.1	**(a)**	What do you understand by Backtracking? What is natural advantage of Backtracking?	**03**
	(b)	Define the following words in the context of AI (i) Intelligence (ii) Knowledge (iii) Information (iv) logical reasoning	**04**
	(c)	Draw the state space for given problem. You have three jugs of capacity of 12 lietrs, 8 literss, and 3 liters. 12 liter of Jug is full of water while other two jugs are given empty. You have to obtain 2 liters of water in 12 liters of jug. You can pour the water on the ground. But no additional water is given. Formulate the state space for the given problem. Solve the problem and suggest the strategy.	**07**
Q.2	**(a)**	Discuss the concept of "Heuristic" with an example.	**03**
	(b)	How do you compare Hill climbing technique with A* algorithm.	**04**
	(c)	Solve the following cryptarithmetic problem. Every letter must be assigned unique digit between 0 to 9.	**07**

	W	I	R	E	
+	M	O	R	E	
M	O	N	E	Y	

OR

	(c)	Discuss Best first search technique.	**07**
Q.3	**(a)**	Briefly discuss Declarative and procedural knowledge.	**03**
	(b)	Represent the following sentences in first-order logic 1. Some students took English subject. 2. Every student who takes English passes it. 3. Every person who buyes policy is a smart. 4. No person buyes an expensive policy.	**04**
	(c)	Take any instance of 8 Puzzle problem and show its solution with A* algorithm.	**07**

OR

Q.3	**(a)**	Define Propositional and predicate logic.	**03**
	(b)	What are the primary problems with Hill climbing? Discuss	**04**

(c) For given following joint probability distribution of two Boolean variables, Find out the following probabilities? **07**

(i) P(Cavity)
(ii) P(~Toothache)
(iii) P(Cavity|Toothache)

	Toothache	~Toothache
Cavity	0.04	0.06
~Cavity	0.01	0.89

Q.4 **(a)** How do you define Artificial neural network? How does it learn? **03**

(b) What is the importance of Fuzzy logic? How do you perform union, intersection and complement operation on the Fuzzy sets? **04**

(c) Elaborate iterative deepening. **07**

OR

Q.4 **(a)** Explain the following terms **03**

(i) Semantic Nets (ii) Frames

(b) List out the property of Monotonic and Non monotonic reasoning. **04**

(c) Define Natural language processing and explain Discourse and Pragmatic processing. **07**

Q.5 **(a)** Discuss the concept of LIST in prolog with suitable example. **03**

(b) Write a prolog program which can list odd and even numbers from the given input list. **04**

(c) Simulate the working of Tic-tac-toe problem with Minimax technique. **07**

OR

Q.5 **(a)** List out the few properties of Prolog programming. **03**

(b) What is the purpose of fail predicate in prolog? Show the purpose with an example. **04**

(c) What do you understand by classification in Neural Network? Briefly explain perceptron algorithm and also narrate its limitation. **07**

****