Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(Old course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 1710410 **Date: 15/12/2015**

Subject Name: Introduction to Artificial Intelligence

Time:2:30 pm to 5:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What is AI? What is intelligence? Discuss practical impact of AI in your field of engineering.	**07**
	(b)	Show the partial state space to solve the 8-puzzle problem using Hill Climbing.	**07**
Q.2	**(a)**	Solve Tic-Tac-Toe game using Mini-Max algorithm.	**07**
	(b)	Write a note on state space representation and explain the terms goal state, path, initial state and successor.	**07**
		OR	
	(b)	Explain Iterative Deepening with suitable example? What is its advantage over BFS and DFS?	**07**
Q.3	**(a)**	Apply the A* algorithm to solve Block World problem. Show partial state space (up to level 3) and various data structures at each step.	**07**
	(b)	Solve given crypt arithmetic problem using constraint satisfaction.	**07**

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      E A T
  + T H A T
  ---------------------
  A P P L E
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OR

Q.3	**(a)**	Explain AO* algorithm.	**07**
	(b)	Solve given crypt arithmetic problem using constraint satisfaction.	**07**

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      L O G I C
    + L O G I C
    ------------------------
    P R O L O G
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Q.4	**(a)**	What is resolution? Explain unification algorithm. Mention one example indicating how unification works.	**07**
	(b)	Following facts are given.	**07**

1. Anyone who passes exam and win prize is happy.
2. Anyone who is either studying or is lucky passes any exam.
3. Harsh is not studying and is lucky.
4. Anyone who is lucky wins prize.

Convert above facts in predicate form. Use resolution to prove that ñHarsh is happyò.

OR

Q.4	**(a)**	Explain forward chaining and backward chaining with suitable example.	**07**
	(b)	Consider the following facts.	**07**

- Å The members of UDISHA club are Jigar, Sarita, Bimal and Raj.
- Å Jigar is married to Sarita.
- Å Bimal is Rajôs brother.
- Å The spouse of every married person in the club is also in the club.
- Å The last meeting of club was at Jigarôs home.

1. Represent above facts in predicate logic.
2. Answer the truth of statement using Backward Chaining: The last meeting of club was at Saritaôs home.

Q.5	**(a)**	Define: joint probability, marginal probability, conditional probability, conditional independence, bayes network, D-separation, casual inference.	**07**
	(b)	Justify given statement with suitable example. Perceptron can only learn from linearly separable problems but not from non-linearly separable problems.	**07**

OR

Q.5	**(a)**	Explain various fuzzification methods with suitable example.	**07**
	(b)	Define: encoding method, initial population, population size, chromosome, genes, crossover, mutation.	**07**

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