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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII EXAMINATION – WINTER 2015

Subject Code:180703 Date:12/12 /2015

Subject Name: Artificial Intelligence (Department Elective-II)

Time: 2:30pm to 5:00pm 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)** Describe different heuristics for the following types of problems: **07**

i. Blocks world ii. Tic Tac Toe

(b) Analyze following problems with respect to the 7 problem characteristics of AI. **07**

i. 8-puzzle ii. Traveling salesman

Q.2 **(a)** Solve following cryptarithmetic problem with appropriate strategy/steps: **07**

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

(b) Discuss hill climbing search method. Also discuss limitations and ways to overcome these limitations. **07**

OR

(b) Discuss simulated annealing search method. Which types of problems are suitable to solve using this method? **07**

Q.3 **(a)** Discuss A* algorithm. Give one example where it is suitable to apply. **07**

(b) Consider the following axioms: **07**

1. Anyone whom Mary loves is a football star.
2. Any student who does not pass does not play.
3. John is a student.
4. Any student who does not study does not pass.
5. Anyone who does not play is not a football star.

Prove using Resolution - “If John doesn't study, Mary doesn't love John.”

OR

Q.3 **(a)** Discuss AO* algorithm. Give one example where AO* is suitable to apply. **07**

(b) Explain non-monotonic reasoning in detail. **07**

Q.4 **(a)** What is linearly separable problem? Design a perceptron for any of such problem. State one example of a problem which is not a linearly separable. **07**

(b) Explain Min-Max search procedure with an example. **07**

OR

Q.4 **(a)** Discuss perceptron learning algorithm. **07**

(b) Explain Bayesian Network in detail. **07**

Q.5 **(a)** Explain Semantic Net in detail. Explain example of partitioned Semantic Net. **07**

(b) Write a Prolog program to find the factorial of a number**.** **07**

OR

Q.5 **(a)** Explain each step of Natural Language Processing in detail. **07**

(b) Explain Cut, Fail and Repeat predicates in Prolog. **07**

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