

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VIII • EXAMINATION – WINTER • 2014**

**Subject Code: 180703****Date: 25-11-2014****Subject Name: Artificial Intelligence****Time: 02:30 pm - 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.

- Q.1** (a) Define AI? Explain the characteristics of AI problem. **07**  
 (b) Solve the following Crypt Arithmetic problem. **07**
- $$\begin{array}{r} \text{DONALD} \\ + \text{GERALD} \\ \hline \text{ROBERT} \end{array}$$
- Q.2** (a) Explain Depth first search and Breadth first search with example. **07**  
 (b) Explain AO\* algorithm. **07**
- OR**
- (b) Explain simulated annealing algorithm. **07**
- Q.3** (a) Consider the following facts. **07**
- i) The member of the St. Bridge club are Joe, Sally, Bill and Ellen.
  - ii) Joe is married to Sally.
  - iii) Bill is Ellen's brother.
  - iv) The spouse of every married person in the club is also in the club.
  - v) The last meeting of the club was at Joe's house.
- 1) Translate the above sentences into formulas in predicate logic.
  - 2) Prove that Ellen is not married.
- (b) Explain the different issues in Knowledge representation. **07**
- OR**
- Q.3** (a) Explain the algorithm of predicate logic resolution. **07**  
 (b) Explain Semantic Net and Frame with example. **07**
- Q.4** (a) What is an expert system? Explain Architecture of an Expert system. **07**  
 (b) Explain Artificial Neural Network. **07**
- OR**
- Q.4** (a) Solve Travelling Salesman Problem using any AI technique. **07**  
 (b) Solve Water Jug Problem using production rule system. **07**
- Q.5** (a) Explain cut and fail predicate with example. **07**  
 (b) Explain steps of Natural Language Processing. **07**
- OR**
- Q.5** (a) Write a prolog program to find sum of all the numbers of a list. **07**  
 (b) Write a prolog program to find maximum number from a list. **07**

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