

## B.Tech. 4th Year Exam., 2014

## ARTIFICIAL INTELLIGENCE

Time : 3 hours

Full Marks : 70

## Instructions :

- (i) The marks are indicated in the right-hand margin.  
 (ii) There are **TEN** questions in this paper.  
 (iii) Attempt any **FIVE** questions.

1. Define production system. Develop a production system for the following problem :  
 5+9

"The water jug problem : You are given two jugs, a 4-litre one and a 3-litre one. Neither has any measuring markers on it. There is a pump that can be used to fill the jugs with water. Develop a production system to get exactly 2 litres of water into 4-litre jug."

2. (a) How to perform iteration and recursion in LISP? Explain with example.  
 (b) Explain the various inference rules for propositional logic. 8+6

3. What is a clause? With the help of following wff, explain how to convert a wff to a set of clauses?  
 2+12

$$(\forall x) \{ P(x) \Rightarrow ((\forall y) \{ P(y) \Rightarrow P(f(x, y)) \} \wedge (\forall y) \{ Q(x, y) \Rightarrow P(y) \}) \}$$

4. (a) Explain different syntactical structures of predicate logic.  
 (b) Discuss different types of resolution. 7+7
5. (a) Explain truth maintenance system.  
 (b) What is default reasoning? 7+7
6. What is meant by heuristic search? Explain A\* algorithm. 7+7
7. Explain fuzzy logic with suitable example. Explain non-monotonic reasoning. 6+8
8. Explain the working principle of RETE matching algorithm. 14
9. Write short notes on the following : 5+4+5  
 (a) Simulated annealing  
 (b) Frames  
 (c) Pattern recognition
10. What are different types of measure used for matching process? What is partial matching? 8+6

\*\*\*