

MCA (III Year)
Term-End Examination
June, 2007

CS-14 : INTELLIGENT SYSTEMS

Time : 3 hours

Maximum Marks : 75

Note : Question number 1 is **compulsory**. Attempt any **three** questions from the rest.

1. (a) Consider following statement : 4.
“Surely the computers cannot be intelligent. They can do only what their programmers tell them.”
Is the latter statement true ? Justify your answer.
- (b) Differentiate the following : 4
(i) Iterative deepening search
(ii) Bidirectional search
- (c) Define the following terms with respect to search algorithms : 8
(i) Completeness
(ii) Optimality
(iii) Time complexity
(iv) Space complexity

- (d) Define a function in LISP called intersection which takes two lists as arguments. The function should return a list containing single occurrences of all elements which appear in both lists. For example
 (intersection '(abegkl) '(acegxy))
 should return (aeg). 8
- (e) With the help of suitable diagram explain production system components. 6
2. (a) Explain the following properties of statements : 10
- (i) Satisfiable
 - (ii) Contradiction
 - (iii) Valid
 - (iv) Equivalence
 - (v) Logical equivalence
- (b) Explain the RETE matching algorithm. For what purpose is it used ? 5
3. (a) What is distance matrix ? How is it different from the probabilistic measures for matching ? 5
- (b) Write a LISP code for finding average of 3 numbers. 3
- (c) Given the following statements S_1 and S_2 below, show that $Q(a)$ is a logical consequence of the two. 4
- $S_1 : ((\forall x) P(x) \rightarrow Q(x)), \quad S_2 : P(a)$
- (d) Explain non-monotonic reasoning. 3

4. (a) Define the three techniques for indexing and retrieval from memory. 3
- (b) Show the conceptual dependency representation of the following sentence : 6
- (i) Milind begged Advait for a scooter.
- (ii) Did Milind ask for a scooter from Advait ?
- (c) Write the differences between the following : 6
- (i) Inheritable knowledge
- (ii) Commonsense knowledge
- (iii) Scripts
5. (a) When would the best first search be worse than simple breadth first search ? Give example. 5
- (b) Explain the means ends analysis technique with the help of suitable example. 5
- (c) With the help of suitable diagram, explain production system inference cycle. 5

