Bachelor in Information Technology (BIT)

Term-End Examination

December, 2007

CSI-23 : TECHNIQUES OF ARTIFICIAL INTELLIGENCE

Time : 2 Hours   *Maximum Marks : 60*

Note :   *There are two sections in this paper. Section A is* **compulsory**. *Answer any* **two** *questions from Section B.*

SECTION A

1. For each of the following statements, state whether it is *true* or *false* :   10

   (i)   Experts systems are more creative than human beings.

   (ii) LISP is pure functional language.

   (iii) OR returns NIL if all of its arguments are NIL.

   (iv) A rule in PROLOG is a general statement about objects and their relations.

   (v)   Interface engine thinks for an expert system.

   (vi) The inference rule Modus Ponens states if P → Q and Q is true then P is true.

   (vii) A rule is applied only when its left hand conditions are matched.

   (viii) Semantic net is used for representation of declarative knowledge.

   (ix) A rule based system is not named as Production Rule System.

   (x)   LASER is frame based expert system shell.

2. (a) Explain the use of heuristics in AI problem solving techniques.   5

   (b) Differentiate between Forward and Backward Reasoning.   5

3. (a) Find whether the following sentence is satisfiable, contradictory or valid :

   (P ∨ Q) → (P ∧ Q)

   Show the intermediate steps.   5

   (b) Find meaning of the following statement :

   (~P ∨ Q) ∧ R → S ∨ (~R ∧ Q)

   for the interpretation :

   P is true, Q is true,

   R is false, S is true.   5

SECTION B

*Attempt any **two** questions from this section.*

4. Explain the following :

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  (a) Inferential Knowledge

  (b) Lists and Atoms

  (c) Frame Based Representation of Knowledge

  (d) Concept of Knowledge Acquisition

  (e) Basic Data types of LISP and PROLOG

5. (a) Write a LISP function that calculates the factorial of a given number. (Recursive and Iterative both)

    9

  (b) Evaluate the following :

    6

    (i) (cons '(a b c) '( ))

    (ii) (Remove-if # 'evenp '(1 2 3 4 5))

    (iii) (append '(a b c) '(( )))

6. (a) Explain with example how predicate logic is used for knowledge representation.   *7*

  (b) What is uninformed search technique ? Explain its algorithm with an example.   *8*