

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 $P \rightarrow Q$ 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 : 5
- $(P \vee Q) \rightarrow (P \wedge Q)$
- Show the intermediate steps.
- (b) Find meaning of the following statement :
- $(\sim P \vee Q) \wedge R \rightarrow S \vee (\sim R \wedge Q)$
- 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 : 15
- (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