Bachelor in Information Technology (BIT)

Term-End Examination

December, 2006

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)   LISP is an interpreted language.

   (ii)   Procedural and declarative knowledge are derived from same facts.

   (iii) Indexing is a technique used for knowledge organisation.

   (iv) 'Cognitive Science' is a stream which is a combination of AI and psychology.

   (v)   'Turing test' is used for defining intelligence.

   (vi) Knowledge base is an essential component of an expert system.

   (vii) 'Dilation' is a term defined in Fuzzy logic.

   (viii) A formal system does not consist of propositional inference rules.

   (ix)   Intelligent editors are special knowledge based systems.

   (x)   Inferencing is used for drawing conclusions in AI applications.

2.   Differentiate between the following :   *10*

   (a)   Backward and Forward chaining

   (b)   Informed and Uninformed search

   Also mention one application of each.

3.   Transform the following into disjunctive normal form   *10*

   $\sim (P \ \& \ Q) \ \& \ (P \lor Q)$

SECTION B

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

4. (a) Define following terms with respect to FOPL : 10

> (i)   Predicates
>
> (ii)   Functions
>
> (iii) Variables
>
> (iv) Constants
>
> (v)   Quantifiers

(b) Write five application areas of AI. 5

5. (a) Write a LISP function to compute the following series : 9

$$F = X + \frac{X^2}{\lfloor 2} + \frac{X^4}{\lfloor 4}$$

Define the factorial function separately.

(b) Evaluate the following : 6

> (i)   (cons '(*23) '(1))
>
> (ii)   (append '(a)'(bc)'(d))
>
> (iii) * (reverse '(a (bc) d))

6. (a) Mention major building blocks of an expert system. Explain the functioning of each block. 10

(b) Explain breadth first search with an example. 5