

## MCA (Revised)

### Term-End Examination

#### MCSE-003 : ARTIFICIAL INTELLIGENCE AND KNOWLEDGE MANAGEMENT

*Time : 3 Hours*

*[Maximum : Marks : 100*

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

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1. (a) What is Turing test? In context of objections to Turing test, briefly discuss Chinese Room Test. 5
- (b) Differentiate between informed search and uninformed search? Classify the algorithms which lies in these two categories, and give appropriate examples. 5
- (c) Obtain DNF and CNF for the formula given below  $\sim(A \rightarrow (\sim B \wedge C))$ . 5
- (d) Write a Prolog program to find the factorial of a number and trace the written code for calculating factorial of 5. 5



- (e) How the concept of uncertainty in knowledge is addressed by Artificial Intelligence? Briefly discuss the structures, used to address uncertainty in knowledge. 5
- (f) What are closed world assumption systems? Briefly discuss the requirement of such systems. 5
- (g) What is Truth Maintenance System (TMS)? Give block diagram of TMS and discuss role of each component. 5
- (h) In Artificial intelligence, what do you mean by Agents? Briefly discuss the role and properties of Agents. 5
2. (a) Write a LISP program to find GCD of two numbers. 5
- (b) Verify  $((p \rightarrow q) \wedge (\sim r \rightarrow \sim q) \wedge \sim r) \rightarrow \sim p$  is a tautology, without using truth table. 5
- (c) Compare and contrast 10
- (i) Forward and Backward chaining
- (ii) BFS and DFS (Depth First Search)  
(Breadth First Search)

3. (a) Write well form formula (wff) for the following:

5

(i) God loves every one who loves some one

(ii) Every person has mother

(b) Write standard form (Skolem form) of the following formulas.

$$\exists x \forall y \forall z \exists u \forall v \exists w P(x, y, z, u, v, w) \quad 5$$

(c) Write short notes on any two of the following:

10

(i) Mean-End Analysis

(ii) A\* Algorithm

(iii) A0\* Algorithm

4. (a) Write propositional syntax (Inference Rule) for the following:

5

(i) Simplification

(ii) Syllogism

(iii) Dilemma

(iv) Hypothetical syllogism

(v) Modus Tollens.

(b) What is an Expert System? Briefly discuss advantages and limitations of Expert Systems?

8

(c) Briefly discuss any two of the following, general categories of agents. 7

(i) Simple Reflex Agent

(ii) Goal Based Agent

(iii) Utility Based Agent

5. (a) What is the principle of resolution? Apply the principle of resolution to prove the theorem "Some who are intelligent can not read", the given knowledge to the system is as follows:

10

(i) Who ever can read is literate

(ii) Dolphins are not literate

(iii) Some Dolphins are intelligent

(b) Write short notes on any two of the following:

5×2=10

(i) S-expression

(ii) Lambdafunction

(iii) Mapping function

—x—