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MCSE-003

MCA (Revised)

Term-End Examination

04205

December, 2016

MCSE-003 : ARTIFICIAL INTELLIGENCE AND KNOWLEDGE MANAGEMENT

Time : 3 hours *Maximum Marks : 100*

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

1. (a) What is the purpose of Turing test ? Give a brief outline of the Turing test. 5

(b) Given the formulae

$$A_1 : X \rightarrow Y;\ A_2 : \sim Y;\ B : \sim X$$

Prove that B is the logical consequence of A_1 and A_2 without using truth table. 5

(c) Give Prenex Normal Form of the WFF given below : 5

$$\forall_x\ (L(X) \rightarrow \exists_x M(X, Y))$$

(d) Write well-formed formulae for the following : 5

(i) Whoever can read is literate

(ii) Some who are intelligent, can't read

(e) Draw a Conceptual Graph for the sentence given below : 5

"Cow has four legs and eats grass."

(f) Evaluate the following LISP expressions : 5

(i) (greaterp 18 151 76)

(ii) (reverse ((pq) r (st)))

(iii) (equal 'a (car '(ab)))

(iv) (cadadr '(a (bc) d))

(v) (list 'a '(bc))

(g) Determine Concentration and Normalization of a Fuzzy set A, given below : 5

A = {car | 0·5, truck | 0·9, bus | 0·7, scooter | 0, bike | 0·2}

(h) What is the role of Agents in Artificial Intelligence and Knowledge Management ? 5

2. Compare and contrast the following : 20

(a) Frames and Scripts

(b) Informed Search and Uninformed Search

(c) Abductive Inference and Analogical Inference

(d) A^* Algorithm and AO^* Algorithm

3. (a) Write a LISP program to perform sequential search. 5

(b) Write a prolog program to identify the brother and sister relation. You can create a knowledge base of your choice. 5

(c) Write short notes on any ***two*** of the following : *10*

(i) PEAS

(ii) Structure of Agents

(iii) Rational Agents

4. (a) Use the technique of resolution over the information set given below to show that the predicate SUPPORTS (BOOK, CUP) is true : *10*

Information Set :

A1 : If x is on top of y, y supports x

A2 : If x is above y and they are touching each other, x is on top of y

A3 : A cup is above a book

A4 : A cup is touching a book

(b) Explain Hill climbing search technique with a suitable example. *5*

(c) Differentiate between Forward chaining and Backward chaining. For what situations, is which chaining mechanism best to use, for a given set of problems ? *5*

5. (a) Write short notes on any ***two*** of the following :

(i) Means-End Analysis

(ii) Semantic Network

(iii) Chain Rule

Use suitable example for each. *10*

(b) Explain A^* search algorithm. How is A^* modified to AO^* search algorithm ? Discuss. *10*