MCSE-003

MCA (Revised)

Term-End Examination

December, 2008

05169

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) Describe the Turing Test. If the Turing Test is passed, does this show that computers exhibit intelligence ? State your reasons. Suggest some advances you think need to be made in order for the Turing Test to be passed ? **10**

(b) Translate the following sentences into first order logic : **10**

(i) All dogs are mammals.

(ii) Tomy is a dog.

(iii) Tomy is a mammal.

(iv) All mammals produce milk.

(v) There is a dog which doesn't produce milk.

(c) Discuss how to deal with the incompleteness, inconsistency, fuzziness, change and non-monotonic reasoning. **10**

(d) Discuss the Hill-climbing algorithm with an example. Mention at least one real world situation where you use Hill-climbing method to solve your problem. **10**

2. (a) Explain the architecture of an Expert System with the help of a diagram. **10**

(b) Distinguish between Natural Language Processing (NLP) and Natural Language Generation. **4**

(c) Illustrate at least two hard problems that Artificial Intelligence research has not yet been able to solve. **6**

3. (a) Define the following in PROLOG : **10**

(i) Parent (X,Y)

(ii) Grandparent

(iii) Sibling

(iv) Both-parent of sibling

(b) Define a fuzzy function *"Tall-man"* **5**

(c) Use a truth table to show that, in propositional logic, $P \rightarrow Q$ can be rewritten as $\neg PVQ$. **5**

4. (a) Set-up a small rule-based system to advise graduates as to what courses they need to take to satisfy requirements for MCA. It will be necessary to consult an expert advisor to get all the requirements. Use PROLOG/LISP (or any other language like C, C++, Java) as programming language. Include explanations for user. **10**

(b) What basic operations must a program perform in order to access specific chunks of knowledge ? **4**

(c) Under what conditions would it make sense to use both forward and backward chaining ? Give an example where both are used. **6**

5. (a) Give two examples of analogical learning you have experienced recently. **4**

(b) What do you mean by a Truth Maintenance System (TMS) ? **4**

(c) What do you understand by supervised learning and unsupervised learning in a neural network model. **4**

(d) Explain the term *"knowledge"* with respect to a knowledge based system. Distinguish between procedural and declarative knowledge. 8

- o 0 o -