

**MCA (Revised)**  
**Term-End Examination**  
**June, 2008**

**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 are the salient aspects of cognitive science ?  
How is it related with AI ? 5
- (b) Give three examples of inferencing with English statements using fuzzy modus ponens. Show that dilation of a fuzzy set  $\tilde{A} = \text{CON}(\tilde{B})$  is a fuzzy set  $\tilde{B}$ . 10
- (c) What is the purpose of case grammars ? Represent the following sentences using case structure : 7
- (i) The plane flew above the clouds.
- (ii) The co-pilot flew the plane.

(d) Transform the following statement into disjunctive normal form : 10

(i)  $\sim(P \ \& \ Q) \ \& \ (P \vee Q)$

(ii)  $\sim(P \vee \sim Q) \ \& \ (R \rightarrow S)$

(e) For a particular event, if the initial observation confirms belief with degree 0.3 and second observation confirms belief with degree 0.2, find the MB, MD and CF for combined observations. 8

2. (a) Given the following information in a database :

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

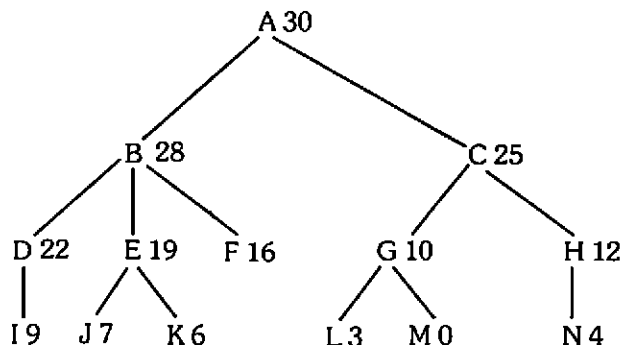
A4 : A cup is touching a book.

(i) Translate statements A1 through A4 in clausal form.

(ii) Show that the predicate supports (book, cup) is true using resolution. 10

- (b) Differentiate between uninformed and informed search. List the node expansion of following tree using best first search :

10



3. (a) Define the following in brief :

10

- (i) Knowledge
- (ii) Intelligence
- (iii) Inheritable knowledge
- (iv) Knowledge acquisition
- (v) Knowledge management

- (b) Explain 'script' knowledge representation technique. Write a script for a supermarket.

10

4. (a) How is inferencing used in deriving conclusions from the facts ? Differentiate between forward chaining and backward chaining. On what factors does the decision to choose forward or backward chaining depend ?

10

- (b) With the help of diagram, explain basic expert system architecture.

10

5. (a) Develop a rule-base using PROLOG for the following relationships : 9
- Mother-in-law  
Daughter-in-law  
Friend
- (b) Define Intelligent-Agent. 3
- (c) What is a Turing Test ? Do you know about any machine which passed Turing Test ? 4
- (d) Machines can be made intelligent artificially but ultimately persons make the machines. So who is more intelligent — the artificial machine or the person ? Discuss. 4