

MCA (Revised)

Term-End Examination

December, 2011

02371

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

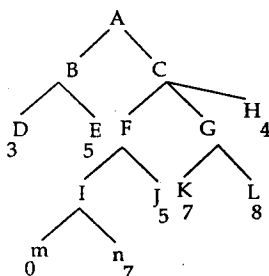
Time : 3 hours

Maximum Marks : 100

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

1. (a) Express the following statement in propositional logic : 5
- (i) If he campaigns hard, he will be elected
 - (ii) If the humidity is high, it will rain either today or tomorrow.
 - (iii) Cancer will not be cured unless its cause is determined and a new drug for cancer is found.
 - (iv) It requires courage and skills to climb a mountain.
 - (v) The Sun rises in the west.
- (b) Derive DNF for the Expression given as follows : 5
- $$\sim(P \rightarrow (\sim Q \wedge R))$$

- (c) Construct the truth table for the formula $P : (\sim A \vee B) \wedge (\sim(A \wedge \sim B))$ 5
- (d) Draw the Semantic Network of the following sentence:
Kavita gives a book to her friend. 5
- (e) What do you mean by learning ? Explain briefly learning methods. 5
- (f) Discuss the advantages and disadvantages of Rule based system. 5
- (g) Write a LISP Program to find a maximum of 3 numbers. 5
- (h) Explain Modus Tollens and Modus Ponens. 5
2. (a) Transform the $(\sim A \wedge B) \vee (A \wedge \sim B)$ into Conjunctive Normal forms. 5
- (b) Write short notes on following : 8
- (i) A^+ Algorithm
- (ii) Mean - End Analysis
- (c) Write the minimax algorithm for game tree searching. Perform the algorithm on the following tree. 7



3. (a) What do you mean by Artificial Intelligence ? 8
Mention some of the characteristics of Intelligence. Also mention some of the tasks which Require intelligence.
- (b) Transform the formula : 4
 $(\forall x) P(x) \rightarrow (\exists x) Q(x)$ into Prenex normal form.
- (c) In artificial intelligence what do you mean 5
by Agents. What is the role of Agents in artificial intelligence ? Briefly Discuss properties of agents.
- (d) What is the Resolution of $(\sim P \vee Q)$ and 3
 $(\sim Q \vee R)$?
4. (a) Write a prolog program to split a list of 8
Numbers into two lists : Positives including Zero and Negatives.
i.e. Split (Numbers, + ves, - ves)
e.g. Split ([3,0,-9,2,-3], [3,0,2,], [-9,-3])
Discuss the architecture of expert system and explain briefly its
- (b) Various components. 7
- (c) What are advantages of using 'cut' in a 2
Prolog Program ?
- (d) Determine whether the following formulas 3
are unifiable or Not : $Q(f(a), g(x))$

5. (a) Let A and B be two fuzzy sets given by 6
following :

$$A = \{ (x_1, 0.2), (x_2, 0.5), (x_3, 0.6) \}$$

$$B = \{ (x_1, 0.1), (x_2, 0.4), (x_3, 0.5) \} \text{ find } (A - B)^2.$$

- (b) Show the conceptual dependency 4
representation of the following sentence :

John wanted Mary to go to the store.

- (c) What are the guidelines to choose whether 6
a problem is appropriate for Expert system
solutions ?

- (d) Explain the procedure of knowledge 4
Acquisition with the help of a diagram.
