

M. Sc. IT-10 (Master of Science in Information Technology)

Fourth Semester Examination 2012

MIT-4004

Artificial Intelligence

Time : 3 Hrs

Max Marks : 60

Note: the question paper has been divided in three sections – A, B and C.
Answer the questions as per instructions given in each section.

Section-A
(Long Answer's Questions)

Answer any two questions. Each question carries 15 marks. 2 x 15 = 30

1. a) What is an expert system? Where an expert system can be used? Discuss various components of a typical expert system with suitable diagram.
b) Discuss concept of fuzzy membership function with the help of suitable example.
2. a) Consider the following group of statements and prove that **Jill killed Tuna** using Resolution.
Everyone who loves all animals is loved by someone. Anyone who kills an animal is loved by no one. Jack loves all animals. Either Jack or Jill killed the cat, whose name is Tuna.
b) Solve following 8-puzzle problem using A* algorithm

Start State		
2	1	3
5	6	7
4	8	

Goal State		
1	2	3
8		4
7	6	5

3. a) What are semantic network? How do they perform inheritance? Explain with the help of suitable example.
b) Explain simple hill climbing approach with the help of suitable example.
4. a) Write a program in PROLOG to prove "John Like Peanuts" using following statements:
John likes all kinds of food
Chicken is food
Anything anyone eats and still alive is food
Bill eats peanuts
Sue eats everything bill eats
Bill is still alive
b) Discuss admissibility of A*.

Section-B
(Short Answer's Questions)

Answer any four questions. Each question carries 5 marks.

4 x 5 = 20

1. What is forward chaining approach? How do we use Modus Ponens rule in forward chaining?
2. Differentiate between uninformed and informed search strategies. Give three examples of each.
3. Does a finite state space always lead to a finite search tree?
4. Discuss time and space complexity of Breadth First search and Depth First Search. Which one is better and why?
5. Write short note LISP.
6. What is unification algorithm? Where unification algorithm is used in artificial intelligence?
7. What is knowledge base? Differentiate between database and knowledge base systems.
8. Explain the following terms:
 - a. State
 - b. State Space
 - c. Search tree
 - d. Action
 - e. Successor function

Section-C
(Objective Type Questions)

Answer all questions. Each question carries 01 mark.

10 x 1 = 10

Write True / False against the following

1. WFF stands for well found formula. (True / False)
2. AO* algorithm makes use of AND-OR graph. (True / False)
3. Expert system makes use of database systems. (True / False)
4. It is mandatory to use Modus Ponens rule in forward chaining approach. (True / False)
5. Predicate logic is also called Quantification Theory. (True / False)
6. Fuzzy logic is a soft computing tool. (True / False)
7. Prolog makes use of resolution in problem solving. (True / False)
8. Propositional logic can handle quantification. (True / False)
9. Graph search control is not irrevocable. (True / False)
10. Best First search combines features of DFS and BFS (True / False)