GANPAT UNIVERSITY - JAN 2012

M. Tech. (IT) SEMESTER – I EXAMINATION

PGIT – 102: Artificial Intelligence & Soft Computing

[Time: 3 Hours Total Marks: 70]

Instructions:

1. Figures to the right indicate full marks.
2. Each section should be written in a separate answer book.
3. Be precise and to the point in your answer.

SECTION – I

Q – 1 Answer Followings:

(A) Discuss Tic-Tac-Toe problem in terms of AI. [5]

(B) Describe with an example of a problem for which breadth-first search would work better than depth-first search. [5]

(C) Define : [2]

- Backward Chaining
- combinatorial explosion

Q – 2 Answer Followings:

(A) You are given two jugs of water. A 3–gallon jug and 5-gallon jug. Neither has any measuring marker on it. We can fill the water from outsource pump. How can we get exactly 4-gallons of water into the 5-gallon jug. Define a problem of Water Jug as a State Space Search. [6]

(B) Discuss ignorable and irrecoverable Class of Problem with an example. [6]

OR

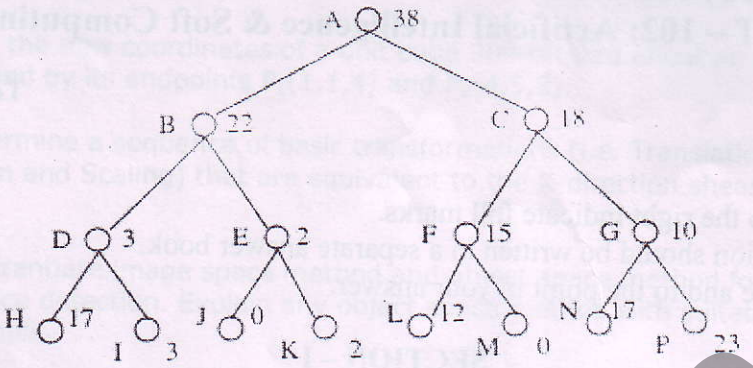
Q – 2 Answer Followings:

(A) Describe Minimax search procedure with an example. [6]

(B) When steepest-ascent hill climbing may fail and what is the solution to overcome it? [6]

Q – 3 Answer Followings:

(A) Consider a search problem where the state space is represented by the following tree: [6]



Each node has an alphabetic label and an estimated distance to the goal. A is the initial state, J and M are goal states.

a) Perform a breadth-first, and then a depth-first, search on the above tree. List the nodes on open and closed for each iteration".

b) Now perform a Best-First search on the same tree and list the nodes on Open and Closed as before.

(B) Assume the following facts: **[5]**

- Steve only likes easy courses.
- Science courses are hard.
- All the courses in the basketweaving department are easy.
- BK301 is a basketweaving course.

Use resolution to answer the question, "What course would Steve like?".

OR

Q – 3 Answer Followings:

(A) Consider the following sentences: **[7]**

- John likes all kinds of food.
- Apples are food.
- Chicken is food.
- Anything anyone eats and isn't killed by is food.
- Bill eats peanuts and is still alive.

a) Translate these sentences into formulas in predicate logic.
b) Prove the john likes peanuts using backward chaining.
c) Convert the formulas of part a into clause form.
d) Prove that John likes peanuts using resolution.

Use resolution to answer the questions, " What food does Sue eat? "

(B) Discuss following: **[4]**

a) Problems
b) Problem spaces

SECTION – II

Q – 4 Answer Followings:

(A) What is constraint satisfaction. Solve the following problem. **[7]**

```
  C R O S S
+ R O A D S
===========
D A N G E R
```

(B) Explain admissibility of A* algorithm. Justify it also. **[5]**

Q – 5 Answer Followings:

(A) Explain resolution in propositional logic. **[6]**

(B) Describe the problem characteristics of the given problem. **[6]**

OR

Q – 5 Answer Followings:

(A) Explain resolution in predicate logic. **[6]**

(B) What is the difference between fuzzy logic and binary logic. Explain with suitable example. **[4]**

(C) What is wrong with the following argument? **[2]**

- Men are widely distributed over the earth.
- Socrates is a man.
- Therefore, Socrates is widely distributed over the earth.

Q – 6 Answer Followings:

(A) Explain Artificial Neural network. **[6]**

(B) Prove the fuzzy Demorgan's law. **[5]**

OR

Q – 6 Answer Followings:

(A) Explain Biological neural network. **[6]**

(B) Solve the following example using Fit-violation theorem. **[5]**

	X1	X2	X3	X4	X5
A	0.2	0.6	0.7	0.9	0
B	0.3	0.5	0.2	0.8	1

==/// End of Paper ///==