53 (IT 715) ARIN

2019

ARTIFICIAL INTELLIGENCE

Paper : IT 715

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(a)* Briefly describe the turing test. Mention some challenges of AI. 10

   (b) Define : 10

   (i) search space

   (ii) heuristic

   (iii) goal distance

   (iv) goal and

   (v) explored node.

Contd.

2. Solve the following cryptarithmetic puzzle. Write constraint equations and find one solution using DFS. Show the steps involved in finding solution. 20

$$\begin{array}{r} S\ E\ N\ D \\ +\ M\ O\ R\ E \\ \hline M\ O\ N\ E\ Y \end{array}$$

3. Explain MINIMAX algorithm. With the aid of MINIMAX strategy, design an algorithm for Tic Tac Toe. 20

4. Water Jug Problem :
There are two jugs, a 5-gallon (5-*g*) and the other 3-gallon (3-*g*) with no measuring marker on them. There is a pump to fill the jug with water. How do you get exactly 4-gallon of water in the 5-gallon jug?

(a) Give the state space for the problem. 5

(b) Describe the production rules. 5

(c) Provide a possible solution with the help of these production rules. 10

5. Consider the following 8-puzzle problem :
Given start state :

3	7	6
5	1	2
4		8

and goal state :

5	3	6
7		2
4	1	8

(a) List the operators. 4

(b) Select a heuristic function for the 8-puzzle problem. 4

(c) Solve the problem by A^* algorithm with your selected heuristic function. 12

6. Consider the following sentences :

- John likes all kinds of food
- Apple is a food
- Chicken is a food
- Anything anyone eats and is not killed by is food
- Bill eats peanuts and is still alive
- Sue eats everything Bill eats.

(a) Translate these sentences into formulae in predicate logic. 10

(b) Convert the formulae into clause form. 10

7. Write short notes on ***any four*** of the following : 5×4=20

(i) State space representation

(ii) Knowledge acquisition

(iii) Alpha-beta pruning

(iv) Local minima and global minima

(v) Expert system shell

(vi) Knowledge Engineering.
