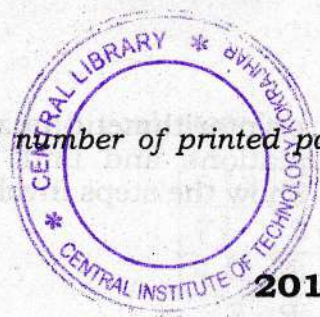


Total number of printed pages-4



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 cryptarithmic puzzle. Write constraint equations and find one solution using DFS. Show the steps involved in finding solution. 20

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

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.