53 (CS 711) ARIN

2019

ARTIFICIAL INTELLIGENCE

Paper : CS 711

Full Marks : 100

Time : Three hours

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

*Answer **any five** questions.*

1. *(a)* Define Artificial Intelligence (AI). Explain how an AI system is different from a conventional computing system. Mention some applications of AI. 15

   (b) Describe DFS with suitable example. 5

Contd.

2. Missionaries and Cannibals Problem :

Three missionaries and three cannibals want to cross a river. There is a boat on their side of the river that can be used by either one or two persons. How should they use this boat to cross the river in such a way that cannibals never outnumber missionaries on either side of the river ? 20

(a) Formulate the problem as a state space search problem.

(b) Draw the implicit search graph.

(c) Does there exist any solution to the problem ? If so, specify the solution.

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

$$\begin{array}{r} B\ A\ S\ E \\ +\ B\ A\ L\ L \\ \hline G\ A\ M\ E\ S \end{array}$$

4. Describe the A^* algorithm with suitable example. 20

5. Explain the concept of alpha-beta pruning in MINIMAX algorithm. 20

6. Consider the following English sentences :

- Anything anyone eats is called food
- Mita likes all kinds of food
- Burger is a food
- Mango is a food
- John eats pizza
- John eats everything Mita eats

(a) Translate these sentences into formulae in predicate logic and then to program clauses. 10

(b) Use resolution algorithm to answer the following goals : 10

(i) What does John eat ?

(ii) Does Mita like pizza ?

7. Describe the Expert System Architecture. Highlight the advantages and disadvantages of Expert System. 20