2012

M.Sc.

3rd SEMESTER EXAMINATION

COMPUTER SCIENCE

PAPER—COS-303

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Group—A

(*Artificial Intelligence*)

[Marks–25]

Answer any *two* questions

1. (i) Discuss the performance of A* algorithm where the heuristic function either underestimate or overestimates the value of states.

   (ii) Iterative deepind A* (IDA*) uses the cost function (g + h) to determine how much further to explore the search space (as opposed to iterative deeping depth-first search which used the depth of the tree). How much does the IDA* increment the search cut-off after each iteration?   7+3

2. You have three jugs, measuring 12 gallons, 8 gallons and 3 gallons, and a water faucet. You can fill the jugs up or empty them out from one to another or onto the ground. You need to measure out exactly 1 gallon.

   (i) Solve the problem.

   (ii) Draw the implicit state space search graph (upto two level and the resulting path).

   (iii) Solve the problem optimally using Breadth-first search technique. Is it a good idea to check the repeated states ?

                                                                    2+3+5

3. (a) Translate the following sentences into formulas into predicate logic.

      ● Ram likes all kinds of food.

      ● Apples are food.

      ● Whoever can read is literate.

      ● Some dolphins are intelligent.

      ● Dolphins are not literate.

   (b) Describe the characteristic of a good knowledge representation system.

                                                                    5+5

[Internal Assessment — 5 Marks]

Group—B

(*Artificial Neural Network*)

[Marks–25]

Answer any *two* questions

4. (a) What do you mean by 'Network Topology'. Discuss the topology 'Instar' and 'Bidirectional associative memory'.

   $1+(2+2)$

   (b) With the help of a Suitable diagram discuss the functioning of a Rosenblat's Perceptron Model.

   Explain how it differs from 'Widrow's Adaline Model'.

   $4+1$

5. What are the significance of the biased value and activation function in a perceptron model of a neuron? Describe the different layer of multilayer perceptron with a block diagram? Briefly explain the competitive learning.

   $(2+2)+3+3$

6. (a) Show how one can realize the logic circuit of NAND and NOR gates using McCulloch Pitt's Model.

   $2×2$

(b) Write a short note on :   3×2

    (i) Hebbian Learning ;

    (ii) Supervised Learning ;

    (iii) Reinforced Learning.

[Internal Assessment — 5 Marks]

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