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

(Turn Over)
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:

(i) Hebbian Learning;

(ii) Supervised Learning;

(iii) Reinforced Learning.

[Internal Assessment — 5 Marks]