Seat No._____

GANPAT UNIVERSITY
M. Tech Sem-I, Information Technology
Regular Examination Dec-Jan 2014
3IT102: Computational Intelligence

Max Time: 3 Hours] **[MaxMarks: 60**

Instructions: 1. Figures to the right indicate full marks of the question.
2. All questions are compulsory.
3. Each section should be written in a separate answer book.

SECTION: I

Q:1 (a) Classify the following problems using AI problem characteristics. [8]
(i) Missionary and Cannibals (ii) N Queen (iii) 8 Puzzle
(iv) Monkey- Banana

(b) Define Backtracking. [2]

OR

Q:1 (a) Explain Best first search procedure with an example [6]

(b) Briefly discuss Hill climbing and also show its weaknesses. [4]

Q:2 (a) You are given 3 Jugs A, B and C of capacity 10 liters, 7 liters and 3 liters. Jug A is completely filled with water while rest jugs are empty. Initial State is (10, 0, 0). You are required to obtain 5 liters of water in Jug A and B. exchange of water between the jugs is only permitted. Obtain the Goal State and also draw the state space. Suggest the appropriate strategy also. [8]

(b) Discuss the characteristics of control strategy. [2]

OR

Q:2 (a) You are given 2 jugs of capacity 7 lites and 5 liters. Obtain 1 liter of water in 7 liters of jug. There are no measuring markers on both the jugs. Obtain the Goal State and also draw the state space. Suggest the appropriate strategy also. [6]

(b) Define 'Heuristic' and also write few heuristics for the 8-Puzzle and N Queen Problem. [4]

Q:3 (a) Solve the following crypt arithmetic puzzle. Every Letter must be assigned unique digit. [6]

	S	E	V	E	N
+	S	E	V	E	N
+			S	I	X
T	W	E	N	T	Y

(b) Discuss Overestimation and Underestimation in A* algorithm [4]

SECTION: II

Q:4 (a) Discuss α-β pruning with an example [7]

(b) Compare Perceptron vs ADALINE [3]

OR

Q:4 (a) Explain Pocket algorithm in brief. [6]

(b) Prove that Given training samples of two linearly separable classes, Perceptron terminates after finite number of steps. [4]

Q:5 (a) Apply the ADALINE using given parameters on following data sets. Continue up to 2 epochs. Learning rate, Initial weights and bias are initialized as 1. [8]

Class 1: (3, 1), (4, 2)

Class 2: (2, 2), (1, 3)

(b) Define Unsupervised learning. [2]

OR

Q:5 (a) Explain the issues related with parameters of Backpropagation algorithm in detail. [8]

(b) Define computational Intelligence and soft computing [2]

Q:6 (a) What are the results obtained using the network of given below in figure 1 if the initial output vectors are (0.5, 0.9, 1, 1, 0.9)? What would be a more desirable value ? Suggest a modification of maxnet that gives the desirable answer. Self excitation weight θ=1 and mutual inhibition magnitude ε < 1/(No of nodes). [6]

(b) Describe various applications of Neural networks [4]

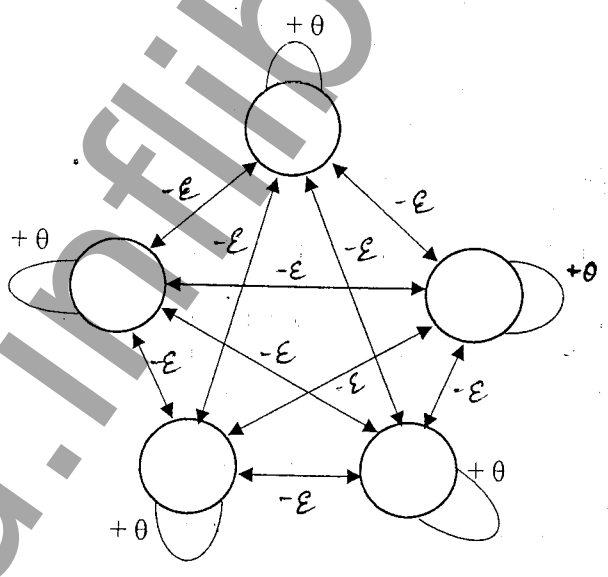

Figure 1 Maxnet: competitive network

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