

GANPAT UNIVERSITY
M. TECH SEM- I (Computer Engineering) REGULAR EXAMINATION NOV-DEC 2016
3CE101: Computational Intelligence

MAX. TIME: 3 HRS

MAX. MARKS: 60

Instructions: (1) This Question paper has two sections. Attempt each section in separate answer book.
 (2) Figures on right indicate marks.
 (3) Be precise and to the point in answering the descriptive questions.

SECTION: I

- Q.1** (a) Discuss irrecoverable, recoverable and ignorable class of problems. What kinds of strategies can be incorporated to solve these types of problems? (6)
- (b) Check whether the following problems are decomposable or not. Justify your answer also. (4)
 (i) Chess (ii) Tower of Hanoi (iii) Water Jug (iv) 8 puzzle
- OR**
- Q.1** Consider the following 8 puzzle problem and derive its solution using BFS and heuristic search technique. Also compare which technique is found better. Elaborate your answer. (10)

1	2	3
8	5	6
4	7	

Initial State

1	2	3
4	5	6
7	8	

Goal State

- Q.2** (a) What do understand by Heuristic? Discuss Hill Climbing with an example. (6)
- (b) Compare Breadth first search and Best first search with an example (4)
- OR**
- Q.2** (a) Solve the following cryptarithmic problem and also suggest the strategy. Also show the state space. (8)
- $$\begin{array}{rcccc}
 & A & B & C & D \\
 + & E & B & C & B \\
 \hline
 A & F & G & A & G
 \end{array}$$
- (b) What are the advantages of heuristic search techniques? (2)
- Q.3** (a) Define the following terms (4)
 (i) Backtracking (ii) Intelligence (iii) State Space (iv) State Space search
- (b) Describe the problem of overestimation and underestimation with A*. (6)

SECTION: II

- Q.4 (a) Define Learning in Neural Networks and state various applications of Neural Networks (5)
- (b) Discuss various issues and challenges in back propagation learning (5)

OR

- Q.4 (a) Explain various types of activation functions in neural networks (6)
- (b) Define Fuzzy logic and show its various applications in engineering (4)

- Q.5 (a) Explain back propagation learning (6)
- (b) Explain following terms in reference of Neural networks (4)
- (i) Bias (ii) Learning rate

OR

- Q.5 Consider the AND gate problem with bipolar inputs (X_1 and X_2) and outputs. Initial weights and bias are 0.4. Learning rate is 0.5. Develop a perceptron model and find out final weights. Continue up to 2 epochs (10)
- Q.6 Develop an Adaline network for given data with bipolar inputs and bipolar targets. Assume initial weights and bias as 0.3. Set learning rate 0.4. Continue up to 2 epochs and compute average mean squared error. (10)

x1	x2	T
1	1	1
1	-1	-1
-1	1	-1
-1	1	-1

-----END OF PAPER-----