Name :	<u>A</u>
Roll No. :	An Parameter of Constitution and Constitution
Invigilator's Signature :	

CS/M. Tech (CSE)/SEM-1/MCSE-103/2012-13

2012 ADVANCES IN ARTIFICIAL INTELLIGENCE

Time Allotted : 3 Hours

Full Marks: 70

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

GROUP – A (Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

 $10 \times 1 = 10$

- i) Fuzzy logic is useful in
 - a) Dealing with uncertainty, imprecision
 - b) Dealing with precise data
 - c) Obscure data
 - d) Random data.
- ii) Fuzzy sets differs from crisp sets by
 - a) Having a degree of memberships for each element
 - b) Subsets
 - c) Operations on the sets
 - d) No difference.

41195

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iii) Genetic Algorithms have following operators except

- a) Reproduction b) Cross-over
- c) Mutation d) Training.
- iv) In unsupervised learning the network learns by
 - a) Using the data
 - b) Using the training examples
 - c) Using the knowledge rules
 - d) Using the inference.
- v) Back propagation Network learns by
 - Back propagating the error and adjusting the weights accordingly
 - b) Back propagating the data from training examples
 - c) Back propagating the outputs and iteratively adjusting the weights
 - d) Repeated presentation of training inputs.
- vi) Neural Networks are mathematical models of
 - a) Human nervous system
 - b) Brain
 - c) Spinal chord
 - d) Cognition.

41195



- vii) Which one of the following problems does not require AI ?
 - a) Face Recognition b) Speech Recognition
 - c) Dictionary d) Language Translator.
- viii) Who coined the term AI ?
 - a) John McCarthy of Stanford
 - b) Marvin Minsky
 - c) Semyour Cray
 - d) Bill Gates.
- ix) Which one of the following is not correct about Generate and Test algorithm ?
 - a) Is a depth first search procedure
 - b) Is an exhaustive search of problem space
 - c) Will find a solution eventually
 - d) Is a breadth first search procedure.
- x) An admissible search algorithm is a
 - a) A search algorithm that is guaranteed to find an optimal path if one exists
 - b) A search algorithm which admits new states which are less promising
 - c) A search algorithm which admits only state which are promising
 - d) None of these.

41195

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xi) A Heuristic function is



- A function that maps from problem state descriptions to measures of desirability usually represented as numbers.
- b) A function which maps initial states to goal states.
- c) Maps currents states to next states.
- d) Penalty function for algorithm.
- xii) Which one of the following is not an advantage of BFS ?
 - a) BFS will not get trapped. While DFS may follow a single, unfruitful path for a very long time even forever.
 - b) If there is a solution, then BFS is guaranteed to find it.
 - c) If there are multiple solutions, then minimal solution will be found.
 - d) BFS requires less memory compared to DFS.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- Describe backward chaining and contrast it with forward chaining. Define a semantic network.
 3 + 2
- 41195



- 3. What is Meta knowledge ? Compare declarative knowledge and procedural knowledge. 2 + 3
- 4. What is a Heuristic ? What is a Heuristic function ? List the Heuristic functions for 8 puzzle and Tic-Tac-Toe. 1 + 2 + 2
- 5. Briefly explain the Best-First Search Algorithm. 5
- 6. Briefly describe the situations where basic and steepest-ascent Hill climbing algorithms may fail to find a solution. How are these situations dealt with ? 5
- 7. What are OR and AND-OR graphs ? How are these graphs implemented in search programs ?3 + 2

GROUP - C

(Long Answer Type Questions)

		Answer any <i>three</i> of the following. $3 \times 15 = 4$	5
8.	a)	What is an Artificial Neural Network ?	3
	b)	Explain how ANNs learn is a supervised and in a	n
		unsupervised mode.	3
	c)	Briefly describe Back propagation algorithm	4
	d)	Define Production System and its classification.	5

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41195



- 9. a) List the major Genetic Algorithm Operators.
 - b) Explain how Genetic Algorithms work the help of a Flow chart.
 - c) Describe how state space search can be applied forWater jug problem.
 - d) Discuss the advantages and disadvantages of DepthFirst Search and Breadth First Search Algorithms.
- 10. a) Explain how underestimates and dynamic programming improve branch and bound search to get A* search ? 8
 - b) Describe the steps involved in Constraint SatisfactionAlgorithm. 3
 - c) What do you know about PEAS ? 4
- 11. a)Briefly explain the Minimax algorithm.5
 - b) How would you implement the Minimax algorithm ? 5
 - c) Discuss the Alpha-Beta Pruning technique. 5

41195

