

**GANPAT UNIVERSITY****M. Tech Semester: I (Computer Engineering)****Regular Examination November – December 2014****3CE102: COMPUTATIONAL INTELLIGENCE****Time: 3 Hours****Total Marks: 60**

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

**Section – I**

- Que. –1 (A) Explain Characteristics of the following problems. [5]  
i) Chess  
ii) 8 puzzle  
(B) Differentiate Breadth first search and Depth first search. Explain with an appropriate example how breadth first search is better than depth first search. [5]
- OR**
- Que. –1 (A) Explain Block word problem. [5]  
(B) What is the difference between hill climbing and best first search? Both of them which technique is better and why? [5]
- Que. –2 (A) What is Cut Predicate. Explain Cut-Fail predicate with suitable example. [6]  
(B) When Hill climbing will be fail. Which are the solutions to overcome to those problems? Explain with Block World Problem. [4]
- OR**
- Que. –2 (A) You are given two water jugs of 16 liters and 7 liters. There is no any measuring mark on it. There is a pump by which you can pour the water into the jugs. How can you get exactly 8-liters of water into the 16 liters jug? [6]  
(B) Explain Resolution with suitable example. [4]
- Que. –3 Define following terms with example. [10]  
i) Heuristic search  
ii) Backtracking

## Section – II

Que. – 4 (A) What is constraint satisfaction? Solve the cryptarithmic puzzle [5]

$$\begin{array}{r} B E S T \\ + M A D E \\ \hline \end{array}$$

(B) When  $h'$  underestimates  $h$ . Explain with suitable example. [5]

OR

Que. – 4 (A) Prove Fuzzy Demorgan's Law.  $(A \cap B)^c = (A^c \cup B^c)^c$  [5]

(B) Explain Artificial Neural Network briefly. [5]

Que. – 5 (A) Show the comparison between Set Theory, Classical Logic and Fuzzy logic. With a suitable example compare the results by using Subsethood theorem and Fit-Violation Theorem [5]

(B) What is Fuzzy logic? Which are the propositional operators to be used in Fuzzy Logic? [5]

OR

Que. – 5 (A) What is Resolution? Write an Algorithm of propositional Resolution. [5]

(B) What is List ? Write a program for rotation of List in left direction. [5]

Que. – 6 Consider the following sentences: [10]

1. John like all kinds of food.
2. Apples are food.
3. Chicken is food.
4. Anything anyone eats and isn't killed by is food.
5. Bill eats peanuts and is still alive.
6. Sue eats everything Bill eats.

Give following answers.

- (a) Translate these sentences into formulas in predicate logic.
- (b) Prove that John likes peanuts using backward chaining.
- (c) Convert the formulas of part (a) into clause form.
- (d) Prove that john likes peanuts using resolution.
- (e) Use resolution to answer the question, "What food does Sue eat?"

END OF PAPER