

**GANPAT UNIVERSITY**  
**M. Tech. (CE/IT) SEMESTER – I EXAMINATION** – JAN 2013  
**3CE102/3IT102: Computational Intelligence**

[Time: 3 Hours

Total Marks: 70]

**Instructions:**

1. Figures to the right indicate full marks.
2. Each section should be written in a separate answer book.
3. Be precise and to the point in your answer.

**SECTION – I**

**Q – 1 Answer Followings:**

- (A) Explain Tic-Tac-Toe problem in AI. [6]  
(B) Discuss with an example “Is the solution a state or path?” [6]

**Q – 2 Answer Followings:**

- (A) Explain TSP problem in AI. [6]  
(B) Explain backward chaining with an example. [5]

**OR**

**Q – 2 Answer Followings:**

- (A) You are given two jugs of water. A 3-gallon jug and 4-gallon jug. Neither has any measuring marker on it. We can fill the water from outsource pump. How can we get exactly 2-gallons of water into the 3-gallon jug. Define a problem of Water Jug as a State Space Search. [6]  
(B) Explain Best First Search with example. [5]

**Q – 3 Answer Followings:**

- (A) Discuss recoverable Class of Problem with an example. [6]  
(B) What is Propotional Resolution? Discuss it with an example. [6]

**OR**

**Q – 3 Answer Followings:**

- (A) Discuss the problems of AI [6]  
(B) Consider the following sentences: [6]
- John likes all kinds of food.
  - Apples are food.
  - Chicken is food.
  - Anything anyone eats and isn't killed by is food.
  - Bill eats peanuts and is still alive.
- a) Convert the formulas of part a into clause form.  
b) Prove that John likes peanuts using resolution.

**SECTION - II**

Q-4	(A)	What is constraint satisfaction? Solve the following problem. $\begin{array}{r} B E S T \\ + M A D E \\ \hline M A S E R \end{array}$	[6]
	(B)	Discuss in detail how to design the system. Represent the problem of chess as a State Space Search.	[6]
		<b>OR</b>	
Q-4	(A)	Solve following using constraint satisfaction. $\begin{array}{r} C R O S S \\ + R O A D S \\ \hline D A N G E R \end{array}$	[6]
	(B)	Consider the following sentences. i) John was a man. ii) John was a pompein. iii) John was born in 40 AD. iv) All men are mortal. v) All pompein died in 79 AD. vi) Volcano erupted in 79 AD. vii) No mortal lives greater than 150 years. viii) It is now 1991. ix) Alive means not dead. x) If someone dies, then he is dead at all later times. Solve John is alive now by using Resolution.	[6]
Q:5	(A)	Discuss various activation functions used in neural network.	[6]
	(B)	Compare Biological Neural network with Artificial Neural Network.	[3]
	(C)	Define the following terms (i) Unsupervised Learning (ii) bias	[2]
		<b>OR</b>	
Q:5	(A)	Develop a perceptron for following 7 input samples with n=1 and initial weights and bias 1. Class 1: (3, 1), (4, 2), (5, 3), (6, 4) Class 2: (2, 2), (1, 3), (2, 6)	[6]
	(B)	Discuss various Neural network architecture briefly.	[5]
Q: 6	(A)	Explain Backpropagation training algorithm and also mention its merits and demerits	[8]
	(B)	Justify fuzziness is not probability.	[2]
	(C)	Given $f(x)=x^2$ , find $f(A)$ by extension principle for the following fuzzy set $A=\{0.1/1, 0.2/-1, 0.2/2, 0.4/-2, 0.3/3\}$ .	[2]

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