



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.TECH(IT)/SEP.SUPPLE/SEM-7/IT-703C/2012**

**2012**

**SOFT COMPUTING**

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 the following :  $10 \times 1 = 10$

i)  $\eta$  is

- a) perception constant
- b) learning rate parameter
- c) learning variable
- d) threshold function constant.

ii) In Piecewise-Linear activation function when the output is in between 0 and 1 then the value of ' $v$ ' is

- a) greater than equal to  $\frac{1}{2}$
- b) less than equal to  $\left(-\frac{1}{2}\right)$
- c) greater than  $\left(-\frac{1}{2}\right)$  but less than  $\frac{1}{2}$
- d) none of these.



- iii) Which of the following is true ?
  - a) Only one feedback loop is there in feedback network
  - b) More than one feedback loop are there in feedback network
  - c) More than equal to one feedback loop are there in feedback network
  - d) None of these.
- iv) Generic Algorithm is a type of
  - a) Heuristic search algorithm
  - b) Breadth First Search algorithm
  - c) Depth First Search algorithm
  - d) Best First Search algorithm.
- v) The full form of BAM is
  - a) Bidirectional Associative Memory
  - b) Bidirectional Auxiliary Memory
  - c) Bitwise Associative Model
  - d) Boltzmann Associative Machine.
- vi) Choose the right answer :
  - a) Selection is
  - b) Mutation is
  - c) Crossover is
  - d) All of these arethe operator(s) of Genetic Algorithm.
- vii) Height of a fuzzy set is
  - a) the total No. of elements in the set
  - b) the largest membership grade of the elements in the set
  - c) the average membership grade of the elements in the set
  - d) none of these.



- viii)  $(A \vee B)'$  is equal to
- $(A' \vee B')$
  - $(A \wedge B)$
  - $A' \wedge B'$
  - none of these.
- ix) A classical set is defined by a
- Fuzzy set
  - Membership fuzzy set
  - Crisp set
  - all of these.
- x) Synapses are
- terminals of neurons
  - mediator between neurons
  - both (a) and (b)
  - none of these.

#### GROUP – B

##### ( Short Answer Type Questions )

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

- Compare between Fuzzy Logic and Crisp Logic.
- Briefly explain about various types of activation functions.
- What do you know about travelling salesman problem ? How can we solve it ?
- Briefly write down about unsupervised learning.
- What is perceptron ? Briefly discuss about Rosenbult's perceptron model.

1 + 4

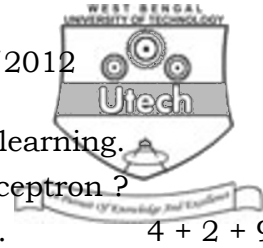
#### GROUP – C

##### ( Long Answer Type Questions )

Answer any *three* of the following.  $3 \times 15 = 45$

- What is Artificial Neural Network ?
  - Differentiate between human brain and artificial neural network.
  - Explain the artificial neural network Mcculloh-Pitt model.
  - Briefly explain about the demerits of Mcculloh-Pitt model.

2 + 5 + 5 + 3



8. a) Briefly explain about error correction learning.  
 b) What do you mean by multi-layer perceptron ?  
 c) Prove the back propagation algorithm. 4 + 2 + 9
9. a) What is clustering ?  
 b) Why is clustering necessary ?  
 c) How many types of clustering algorithm are there and what are those ?  
 d) Write down any one clustering algorithm. 2 + 4 + 2 + 7
10. a) What is fuzzy set ?  
 b) What are the roll of  $\alpha$ -cuts and strong  $\alpha$ -cuts in fuzzy set theory ? What is the difference between them ?  
 c) What is fuzzy Cartesian product ?

Consider the following fuzzy relations :

$$R = \begin{matrix} & y_1 & y_2 \\ \begin{matrix} x_1 \\ x_2 \end{matrix} & \begin{bmatrix} 0.5 & 0.4 \\ 0.7 & 0.3 \end{bmatrix} \end{matrix} \text{ and } S = \begin{matrix} & z_1 & z_2 & z_3 \\ \begin{matrix} y_1 \\ y_2 \end{matrix} & \begin{bmatrix} 0.6 & 0.2 & 0.4 \\ 0.3 & 0.1 & 0.5 \end{bmatrix} \end{matrix}$$

Find the relation which relates elements of universe  $Z$  using max-min compositions and max product composition. 2 + ( 3 + 3 ) + ( 1 + 6 )

11. Write short notes on any *three* of the following : 3 × 5 = 15
- a) Fuzzification and Defuzzification  
 b) Genetic Algorithm  
 c) MADALINE Network  
 d) Baye's theorem  
 e) Perceptron Convergence Theorem.

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