END SEMESTER MAKE-UP EXAMINATION (FEBRUARY 2022)-QUESTION PAPER-PART A (Copy)

COURSE CODE	: ICE4014
COURSE NAME	: Neural Network and Fuzzy Logic
SEMESTER	: VII
DATE OF EXAM	: 17-02-2022
DURATION	: 45 + 3 minutes

Instructions for Students:

 (1) ANSWER ALL THE QUESTIONS.
 (2) EACH QUESTION CARRIES 1 MARK.
 (3) YOU ARE INSTRUCTED TO INFORM THE INVIGILATOR AFTER SUBMISSION OF THIS FORM IN THE CHAT SECTION.

* Required

* This form will record your name, please fill your name.

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STUDENT NAME: *

REGISTRATION NUMBER: *

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When the cell is said to be fired?

-) if potential of body reaches a steady threshold values
-) if there is impulse reaction
-) during upbeat of heart
-) none of the mentioned

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What is the feature of ANNs due to which they can deal with noisy, fuzzy, inconsistent data?

-) none of the mentioned
- associative nature of networks
- both associative & distributive
-) distributive nature of networks

Noise saturation dilemma refers to

- how can a neuron with limited operating range be made sensitive to nearly unlimited range of inputs
 -) none of the mentioned
-) at saturation state neuron will stop working, while biologically it's not feasible
-) can be either way

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The type of learning employed to find the weights by learning for orthogonal input vectos is ------

No learning law



Hebb learning



) perceptron learning law

Among the following which is an example of a unsupervised learning?

- voice recognition
-) image recognition
- text recognition
-) none of the mentioned

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The factor which decides the number of units of hidden layer

-) both the number of inputs and outputs
-) the overall characteristics of the mapping problem
-) the number of outputs
-) the number of inputs

Which statement is true for Back propagation rule?

- hidden layers output is not all important, they are only meant for supporting input and output layers
-) none of the mentioned
-) it is a feedback neural network
-) actual output is determined by computing the outputs of units for each hidden layer

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A 4-input neuron has weights 1, 2, 3, and 4. The transfer function is linear, with the constant of proportionality being equal to 2. The inputs are 4, 10, 5, and 20, respectively. The output will be:

-) 123
- () 76
-) 238
-) 119

1	1	

The value of output of the neuron Y for the single layer network with [x1 x2 x3]=[0.8 0.6 0.4] and [w1 w2 w3]=[0.1 0.3 -0.1] using bipolar sigmoidal function is

0.259

- 0.635
-) 1

0.23

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The activation of a MP-neuron is ----- and there is a ------ threshold for each neuron

\bigcirc	Bin	ary, fixe	ed
\bigcirc			

) bipolar, variable

) Binary, variable

) bipolar, fixed

According to Hebb rule the weight vector is found to increase proportionately to the product of the input and ------

dissipation factor

) learning signal

) threshold

) Momentum factor

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Perceptron learning rule originates from ------ learning rule whereas delta rule originates from ------ method.

Hebbian, gradient descent method





) MP, gradient descent method

- Adjusted, fixed
-) Variable, variable
-) Fixed, variable
- Fixed, adjusted

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Which of the following neural networks uses supervised learning?

- A. Multilayer perceptron
- B. Self-organizing feature map
- C. Hopfield network



- B) only
- A) and B) only
- A) only

Following is the main point of difference between Adaline and Perceptron

Weights are compared with output



- Sensory unit result is compared with output
- Analog activation value is compared with output

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The membership values of the membership function are nor strictly monotonically increasing or decreasing or strictly monoronically increasing than decreasing.

) Normal

Non Convex Fuzzy set

) Convex Fuzzy set

If A and B are two fuzzy sets with membership functions

 $\mu A(x) = \{0.6, 0.5, 0.1, 0.7, 0.8\}$ $\mu B(x) = \{0.9, 0.2, 0.6, 0.8, 0.5\}$

Then the value of $\mu(A \cup B)'(x)$ will be

- {0.9, 0.5, 0.6, 0.8, 0.8}
- (0.6, 0.2, 0.1, 0.7, 0.5)
- (0.1, 0.5, 0.4, 0.2, 0.3)
- () {0.1, 0.5, 0.4, 0.2, 0.2}

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Membership function can be thought of as a technique to solve empirical problems on the basis of

) Experience

) Examples

) Knowledge

) Learning

If the fuzzy set has two sub regions, then the center of gravity of the sub region------ can be used to calculate the defuzzified value

- With the median of the area
- With the largest area



) With the smallest area

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Suppose a fuzzy set Young is defined by

Young={(10,0.5), (20.0.8),(30,0.8),(40,0.5), (50,0.3)}

Then the crisp value of young using **MoM** method is



One difference between Mamdani approach and Takagi-Sugeno approach to FLC design is that

a. Mamdani approach needs defuzzification module whereas Takagi-Sugeno approach does not

b. Takagi-Sugeno approach does not require any fuzzification module whereas Mamdani approach needs

c. Takagi-Sugeno approach is more interpretable but less accurate

d. All of the above

-) d
- 🔵 a
- () c
- ∩ h

Question

Given two fuzzy sets with M.F $\mu_A(x)$ and $\mu_B(x)$ respectively Bounded d by

```
a. \mu_A(x). \mu_B(x)
b. \mu_A(x)+ \mu_B(x)- \mu_A(x). \mu_B(x)
c. min{1, \mu_A(x)+ \mu_B(x)}
d. max(0, \mu_A(x)+ \mu_B(x)-1}
```

C
C
d
0
b
0
a

For a fuzzy relation R, R= $\begin{bmatrix} 0.7 & 0.2 & 0.3 \\ 0.9 & 0.5 & 1 \\ 0.8 & 0.3 & 0.7 \end{bmatrix}$ alpha cut relation for A. $\begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 0 \\ 0 & 1 & 1 \end{bmatrix}$ B. $\begin{bmatrix} 0 & 0 & 0 \\ 1 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$ C. $\begin{bmatrix} 0 & 0 & 0 \\ 1 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$ D. $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ b a c d let P= $\begin{bmatrix} 0.3 & 0.5 & 0.8 \\ 0 & 0 & 0 \end{bmatrix}$ $\begin{bmatrix} 0.9 & 0.5 & 0.7 & 0.7 \\ 1 & 0 & 0 \end{bmatrix}$ Find R Where R=PPQ using max-min composition

$A = \begin{bmatrix} 0.8 \\ 1 \\ 0.5 \end{bmatrix}$	0.3 0.2 0.4	0.5 0.5 0.5	0.5 0.7 0.6	$B = \begin{bmatrix} 0.8 \\ 0.5 \\ 0.5 \\ 0.5 \end{bmatrix}$	0.3 0.2 0.5	0.5 0.8 0.5	0.5 0.7 0.5
$C = \begin{bmatrix} 1 \\ 0.5 \end{bmatrix}$	1 0.5	0.5 0.5	0.5 1	$D = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$	1 0	1 0.8	1 0.7
L _{0.5}	0.4	0.5	0.5	Lo.5	0.5	0	0.5

) b

() d

а

⊖ c

Question

Two fuzzy sets A and B with membership functions $\mu_A(x)$ and $\mu_B(x)$ resp as below

A=Hot climate with $\mu_A(x)$ as the M.F

B= cold climate with $\mu_B(x)$ as the M.F

Then pleasant climate is given by

- a. 1- $\mu_B(x)$
- b. max($\mu_A(x), \mu_B(x)$)
- c. min($\mu_A(\mathbf{x}), \mu_B(\mathbf{x})$)
- d. 1-µ_A(x)
- c
- () d
-) b
-) a

What is the band width of the fuzzy set A which is given as follow A=(10,0.1),(15,0.2),(20,0.5), (25,0.4), (30,0.4), (35,0.5),(40, 0.2),(45,0.1)

- 20
- -15
-) 15
-) 30

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A = (x1, 0.5), (x2, 0.1), (x3, 0.4) and B = (x1, 0.2), (x2, 0.3), (x3, 0.5) union of the two fuzzy sets is given by

- (x1,0.2),(x2,0.3),(x3,0.5)
- (x1,0.5),(x2,0.1),(x3,0.4)
- (x1,0.2),(x2,0.1),(x3,0.4)
- (x1,0.5),(x2,0.3),(x3,0.5)

For k>1, which of the following concept can be used to generate other linguistic hedge

\bigcirc	Concentration	and	Dilation
\bigcirc	concentration	ana	Bhation





) Dilation

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How is Fuzzy Logic different from conventional control methods?

\bigcirc	FOR approach
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) IF an THEN approach

Which of the following cannot be stated using fuzzy logic?

Height of a person





Color of an apple

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