Exam No: _____

GANPAT UNIVERSITY

M. TECH SEM- II (EE) REGULAR EXAMINATION– APRIL-JUNE 2015

3EE201: Applications of AI in Electrical Engineering

TIME: 3 HRS **TOTAL MARKS: 60**

Instructions: (1) This question paper has two sections. Attempt each section in separate answer book.

(2) Figures on right indicate marks.

(3) Be precise and to the point in answering the descriptive questions.

SECTION: I

Que -1

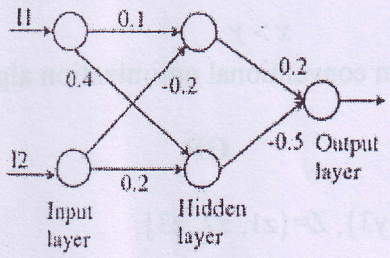
(A) Derive generalized delta learning rule for multi layered feed forward network. **(08)**

(B) What do you mean by activation function? **(02)**

OR

Que -1 **(10)**

A neural network which consist two input neurons, two hidden neurons, and one output neuron as shown below,



Using following training adjust weights of neural network for one epoch.

Sr. No.	Input (I_1)	Input (I_2)	Output
1	0.4	-0.7	0.1

Que -2

(A) Describe pseudo inverse techniques of RBF network. **(06)**

(B) How MADALINE network is used to cater X-OR problem? Explain. **(04)**

OR

Que -2

(A) Describe: How ANN can be used for load forecasting? **(06)**

(B) Explain Hebbian learning. **(04)**

Que -3 Attempt Following Questions

(A) Compare: MLP with RBFN **(03)**

(B) Write a note on "Turing Test". **(03)**

(C) Draw the architectural and additive neural network model of Hopfield network. **(04)**

SECTION: II

Que -4

(A) Give the difference between crisp logic and fuzzy logic. **(05)**

(B) Describe fuzzy IF-THEN rule along with fuzzy inference system. **(05)**

OR

Que -4

(A) Explain various types of defuzzification methods with suitable example. **(05)**

(B) Explain union, intersection and complement operations on fuzzy membership functions. **(05)**

Que -5

(A) Draw following Membership Functions for real variables x, α, β and γ. **(05)**

1) $\Gamma(x; \alpha, \beta) = \begin{cases} 0 & x < \alpha \\ \dfrac{x-\alpha}{\beta-\alpha} & \alpha \le x \le \beta \\ 1 & x > \beta \end{cases}$,

2) $\wedge(x; \alpha, \beta, \gamma) = \begin{cases} 0 & x < \alpha \\ \dfrac{x-\alpha}{\beta-\alpha} & \alpha \le x \le \beta \\ \dfrac{\gamma-x}{\gamma-\beta} & \beta \le x \le \gamma \\ 0 & x > \gamma \end{cases}$,

(B) How does the GA differ from conventional optimization algorithm? Give the various comparison points. **(05)**

OR

Que -5

(A) X={x1, x2, x3}, Y={y1, y2, y3}, Z={z1, z2, z3}. **(05)**

Let R be the fuzzy relation

	y_1	y_2
x_1	0.5	0.1
x_2	0.2	0.9
x_3	0.8	0.6

S be a fuzzy relation

	z_1	z_2	z_3
y_1	0.6	0.4	0.7
y_2	0.5	0.8	0.9

Find R°S (composition rule).

(B) What is mutation in GA? Explain how mutation can be implemented? **(05)**

Que -6 Attempt Any Two. **(10)**

(A) Explain reproduction. Also explain Roulette-wheel selection.

(B) What are the demerits of single point crossover? How multipoint crossover overcome these disadvantages? Explain with suitable example.

(C) Explain following terms:

1. Fitness function
2. Selection
3. Initialization
4. Termination
5. Chromosome

END OF PAPER