Total No. of Questions : 12]

SEAT No. :

P3551

[Total No. of Pages : 3

[4859] - 126A

B.E. (Electronics)

SOFT COMPUTING TOOLS

(2008 Pattern) (Elective - III) (Semester - II)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer one question each among Q1 OR Q2, Q3 OR Q4 and Q5 OR Q6.***
2) ***Answer one questions each among Q7 OR Q8, Q9 OR Q10 and Q11 OR Q12.***
3) ***Answers to the two sections should be written in separate answer books.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***Figures to the right indicate full marks.***
6) ***Use of electronic pocket calculator is allowed.***
7) ***Assume suitable data if necessary.***

SECTION - I

Q1) a) Draw the block diagram of an intelligent system and explain its working. **[6]**

b) Compare hard and soft computing. **[6]**

c) Write short note on Neuro-Fuzzy and soft computing characteristics. **[6]**

OR

Q2) a) Explain the role of neural networks in soft computing. **[6]**

b) What is fuzzy set theory? Where it is used in soft computing. **[6]**

c) Write short note on applications of soft computing. **[6]**

Q3) a) Explain any eight features of a membership function defining a fuzzy set in detail. **[8]**

b) Write short note on properties of and operations on fuzzy sets. **[8]**

OR

Q4) a) Explain in detail Centroid method and Max-Membership principle method for de-fuzzification. **[8]**

b) Write short note on fuzzy rules. **[8]**

P.T.O.

Q5) a) Draw the architecture of fuzzy control system and explain its working in detail. **[10]**

b) What are the advantages of fuzzy controllers over that of conventional controller? **[6]**

OR

Q6) a) Which steps are involved in designing of a fuzzy controller. **[8]**

b) Write short note on applications of fuzzy control systems. Explain any one application in detail. **[8]**

SECTION - II

Q7) a) Draw and explain the structure of biological neuron with details about electrical activities in it. **[8]**

b) Explain in detail back propagation training algorithm. **[10]**

OR

Q8) a) Draw the Rosenblatt's Perceptron model of a neuron and explain its working. Implement a neural network for ANDNOT function with bipolar data using perceptron learning rule. **[12]**

b) What is topology of a neural network? Explain different topologies with neat diagrams. **[6]**

Q9) a) What is activation function? Enlist the various activation functions used in neural network and explain one in detail. **[8]**

b) State different types of learning used in neural networks and explain them with suitable examples. **[8]**

OR

Q10) Write short note on applications of neural networks and explain any two in detail. **[16]**

Q11) a) Draw the architecture of ANFIS and explain it in detail. **[8]**

b) Write short note on advantages and disadvantages of ANFIS over FIS. **[8]**

OR

Q12) Use RBFN and train it to solve the XOR problem whose details are given below : **[16]**

Input-Output table:- X_1 and X_2 are inputs and Y is ouput.

X_1	X_2	Y
0	0	0
0	1	1
1	0	1
1	1	0

Network parameters :

Assume two clusters with centers as C_1 = [0, 0] and C_2 = [1, 1]. Select the two φ - functions as Gaussian with $\mu = 0$ and $\sqrt{1/2}$, Use direct solution approach instead of gradient decent for the supervised training.

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