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B.E. (Computer)

NEURAL NETWORKS

(2008 Pattern) (Elective - III)

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

Instructions to the candidates :

1) *Answers to the two sections should be written in separate answer books.*
2) *Attempt Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 from Section I and Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12 from Section II.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right side indicate full marks.*
5) *Use of calculator is allowed.*
6) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) Draw a McCulloch Pitts Neuron model. Define the firing rule and explain how it performs the basic logic operations for NOR Gate. **[8]**

b) What is Linear Separability? Illustrate with example. **[8]**

OR

Q2) a) What is weight vector in ANN training? How it is described in following learning laws : **[8]**

i) Hebb's Law and

ii) Delta Learning Law

b) Explain with example the task of pattern analysis as Classification and Clustering. Give examples of ANNs used for the same. **[8]**

Q3) a) Explain architecture, algorithm and applications of ADALINE and MADALINE. **[10]**

b) Draw and explain the architecture of RBFN (Radial Basis Function) Network. How it act as classifier? **[8]**

OR

Q4) a) Draw a 3-layer FeedForward Neural Network. Explain the Back propagation training algorithm in detail. **[10]**

b) What is an Activation Function? How it helps in Neural Network training? Explain any two activation functions. **[8]**

Q5) a) Explain the architecture of Boltzmann machine. **[8]**

b) With example illustrate the concept of stochastic update and thermal equilibrium. **[8]**

<div align="center">OR</div>

Q6) a) What do you mean by associative learning? Discuss the architecture and operation of Hopfield Network. **[8]**

b) What is meant by simulated annealing? What is annealing schedule? **[8]**

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SECTION - II

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Q7) a) What is vector quantization? Explain the algorithm and discuss how it can be used for pattern clustering. **[10]**

b) Discuss the architecture of Recurrent Neural Nertwork. **[8]**

<div align="center">OR</div>

Q8) a) What is plasticity-stability dilemma problem? Explain the ART Training algorithm used for pattern clustering. **[10]**

b) Explain how Support Vector Machine (SVM) can be used for pattern classification. **[8]**

Q9) a) Discuss in brief auto-association and hetero-association process used for neural processing. **[8]**

b) Explain the use of ANN in character recognition. Comment on the feature vector and training required for the recognition task. **[8]**

<div align="center">OR</div>

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Q10)a) How can we solve the optimization problem by ANN? Discuss the practical difficulty in solving the travelling salesman problem by means of ANN. **[8]**

b) Draw and explain the architecture of Bidirectional Associative Memory.**[8]**

Q11)a) Compare Neuro Fuzzy systems with traditional Neural systems. State the advantages and disadvantages. **[8]**

b) What is Soft Computing? What are the application areas of Soft Computing? What do you mean by hybrid systems? **[8]**

OR

Q12)a) What do you mean by Fuzzy Logic? What is the use of membership function? Give any Two examples. **[8]**

b) Explain the architecture of any suitable Neuro Fuzzy system designed for pattern recognition task. **[8]**

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