P1092

[4659] - 239

B.E. (Computer Engineering)
NEURAL NETWORKS
(2008 Pattern) (Semester - II) (Elective - III) (410450)

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 Q1 or Q2, Q3 or Q4, Q5 or Q6 from Section I and Q7 or Q8, Q9 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) Discuss the important features of Artificial Neural Network (ANN). What do you mean by Neural learning? State different types of learning. **[8]**

b) Draw a McCulloch Pitts Neuron model. Define the firing rule and explain how it performs the basic logic operations for NAND Gate. **[8]**

OR

Q2) a) What is weight vector in ANN training? How it is described in following learning laws: (i) Hebb's Law and (ii) Widrow and Hoff LMS learning. **[8]**

b) Compare between clustering and classification. Give one example of classification task where clustering is not helpful. **[8]**

Q3) a) What is linearly Non- separable classification problem? Can single Perceptron solve such problem? Define the Delta Learning Rule for multi-perceptron layer. **[10]**

b) State the significance of Learning Rate, Momentum term and activation function in Back propagation training. **[8]**

OR

Q4) a) Explain the architecture, algorithm and applications of ADALINE and MADALINE. **[10]**

b) Draw 3-layer Fed Forward Neural Net architecture. State and define sigmoid activation function. How we decide the number of neurons in the input and output layer for a particular application? **[8]**

Q5) a) What is meant by simulated annealing? What is annealing schedule? **[8]**

b) Discuss the Hopfield Network training algorithm to store and recall a set of bipolar patterns. **[8]**

OR

Q6) a) Describe Boltzmann learning law. Explain limitation of Boltzmann learning.**[8]**

b) What is meant by stochastic update of a neuron? Explain the concept of equilibrium in stochastic neural networks. **[8]**

SECTION - II

Q7) a) How pattern Clustering is different than Classification? Explain with algorithm the self-organizing network used for feature mapping. **[10]**

b) What is vector quantization? How it is used for pattern clustering? **[8]**

OR

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

b) Explain Hebbian learning with example. **[8]**

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

b) Explain with architecture and algorithms the use of ANN in character recognition. **[8]**

OR

*Q10)*a) Explain the steps in the solution of a general optimization problem by ANN. **[8]**

b) With example, explain the following terms w.r.t. pattern recognition system-

i) Preprocessing (ii) Feature Extraction (iii) Training **[8]**

*Q11)*a) What do you mean by Fuzzy Logic? What is the use of membership function? Give any Two examples. **[8]**

b) How Fuzzy logic is synthesized with ART? What is Fuzzy ARTMAP? Explain in brief the architecture of Fuzzy ARTMAP. **[8]**

OR

*Q12)*a) What do you understand by Soft Computing? Explain and compare its different components/tools with features. **[8]**

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

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