[Total No. of Questions: 12] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE
[4364]-776
B. E. (Computer) Examination - 2013
Neural Network
(2008 Course)(Sem II)(Elective III)

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

Instructions:

1 *Answer* ***Q1 or Q2, Q3 or Q4, Q5 or Q6*** *from section I and* ***Q7 or Q8, Q9 or Q10, Q11 or Q12*** *from section II.*
2 *Answers to the* ***two sections*** *should be written in* ***separate answer-books****.*
3 *Neat diagrams must be drawn wherever necessary.*
4 *Assume suitable data, if necessary.*
5 *Black figures to the right indicate full marks.*

SECTION -I

Q.1 A Draw Schematic diagrams of a typical biological neuron and its artificial neuron model. Explain briefly the operation of a biological neuron and artificial neuron. Explain role of transfer function. [9]

B What is learning? What are the basic learning laws? Describe any one Learning law. [9]

OR

Q.2 A What are the main differences amongst three models of artificial neuron, namely, McCulloch-Pitts, perceptron and adaline? [9]

B Which are various data structure used for Artificial Neural Systems (ANS) implementation? Explain Array-Based Data Structure used for ANS implementation. [9]

Q.3 A Explain supervised learning and unsupervised learning with example of each. Explain any one supervised learning method used in Artificial Neural Network [8]

B Explain Back Propagation Neural Network with example. Include following points: 1>diagram 2>learning method 3>training rule and algorithm 4>classification [8]

OR

Q. 4 A Distinguish between linearly separable and linearly inseparable problems with example. Why a single layer of perceptron cannot be used to solve linearly inseparable problems? [8]

B Explain Adaline and Madaline with diagram. Explain learning rule and transfer function used in Adaline. [8]

Q. 5	A	What is the Hopfield mole of a neural network? What is a state transition diagram for Hopfield Neural Network? Explain how to derive it in Hopfield model.	[8]
	B	What are hard problems in pattern storage task? How to solve the hard pattern storage problems?	[8]

OR

Q. 6	A	Give note on Stochastic Networks and Simulated Annealing.	[8]
	B	Describe the Boltzmann machine and Boltzmann learning law. What are the limitations of the Boltzmann learning?	[8]

SECTION II

Q. 7	A	Draw and explain Competitive Learning Network. Explain training in Competitive Learning Network.	[8]
	B	What is SOFM? Draw and explain its architecture. How training is done in SOFM?	[8]

OR

Q. 8	A	What is ART? What is the significance of 'resonance' in ART network? Explain briefly the operation of an ART.	[8]
	B	Explain unsupervised learning Neural Network.	[8]
Q. 9	A	What is an associate memory? What are the requirements of an associate memory? Distinguish between hetero-associative and auto-associative memories with example.	[9]
	B	What is Stability- Plasticity Dilemma? How the problem is resolved?	[9]

OR

Q. 10	A	Explain any one application of Artificial Neural Network in detail with following: Points: 1>Define application category: (e.g. Image processing/ decision making/ Optimization, etc.) 2>Define on specific application (e.g. character recognition) 3>Input and output for above application 4>Proposed neural network architecture 5>Training and training rule 6>Classification	[18]
Q. 11	A	Explain and draw any one model of fuzzy neural system.	[8]
	B	Give advantages of neuro-fuzzy combination. Explain any one application fuzzy neural system.	[8]

OR

Q. 12	A	Define 1>Fuzzy Logic 2> Crisp Logic 3>Membership Function 4>Neuro-Fuzzy Combination	[8]
	B	Give advantages and disadvantages of Artificial Neural Network	[8]