

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
 TEST -III EXAMINATION- 2024
 M.Tech-II Semester (ECE/CSE)

COURSE CODE(CREDITS): 22M11CI211(3)

MAX. MARKS: 35

COURSE NAME: SOFT COMPUTING

COURSE INSTRUCTORS: MUNISH SOOD

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) Marks are indicated against each question in square brackets.

(c) The candidate is required to make suitable numeric assumptions wherever required for solving problems

Q1) Construct a Kohonen self organizing map to cluster 4 given vectors [0,0,1,1]; [1,0,0,0]; [0,1,1,0] and [0,0,0,1]. Number of clusters to be formed are 2. Assume initial learning rate of 0.5.

[5] CO-2

Q2) Implement XOR gate using multilayer perceptron network.

[5] CO-3

Q3) Consider an Adaptive resonance theory type 1 (ART-1) net with 5 input units and 3 cluster units. After some training the net attains the bottom-up $B_{3 \times 5}$, and top-down $T_{3 \times 5}$ weight matrices as shown below. Show the behavior of the net if it is presented with the training pattern $s = [0,1,1,1,1]$. Assume learning rate $L=2$ and vigilance parameter $\rho=0.8$.

[5] CO-4

$$B_{3 \times 5} = \begin{bmatrix} 2 & 0 & 2 \\ 5 & 8 & 2 \\ 5 & 8 & 2 \\ 5 & 8 & 2 \\ 1 & 0 & 2 \end{bmatrix}, \text{ and } T_{3 \times 5} = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 & 0 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

Q4) Implement AND gate using Widrow Hoff Delta learning rule for artificial neural networks.

[5] CO-3

Q5) Using Hebb's rule find weights required to perform the following classification of given input pattern. '+' symbol represents the value +1 and empty symbol equals -1. Consider " I " belongs to the members of the class and hence target value = 1 and " O " does not belong to the members of the class and hence target value = -1.

[5] CO-4

+		+
	+	
+		+

" I "

+	+	+
+	+	+

" O "

Q6) Write short notes on

[10] CO-3

- a) Multi Layer Perceptron
- b) Convolutional Neural Network
- c) Adaptive Resonance Theory
- d) Competitive learning rule
- e) Credit Assignment Problem

JUIT TEST 3 EXAMINATION JUNE 2024