JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Make-up Examination-Nov-2025

Ph.D.-I Semester (CSE)

COURSE CODE (CREDITS): 22P1WMA231 (03) MAX. MARKS: 25

COURSE NAME: APPLIED SOFT COMPUTING TECHNIQUES

COURSE INSTRUCTORS: ARV MAX. TIME: 1 Hour 30 Minutes

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	Discuss the Hard-limit transfer function, linear transfer function and sigmoid transfer function.	4	5
Q2	Consider a linear neuron $y=w_1x_1+w_2x_2+b$. The inputs $x=[2, 1]$, weights $w=[0.25, 0.5]$, bias $b=0.1$ and Target $t=1.9$. Compute output for the linear neuron and squared error using $E=1/2(t-y)^2$.	4	5
Q3	A neural network has: • Inputs: x1=1, x2=2 • Hidden Layer: 2 neurons (Sigmoid activation) • Output Layer: 1 neuron (Sigmoid activation) Weights and biases: Connection Weight $w_{11}=0.1$, $w_{12}=0.2$ (to hidden neuron 1) $w_{21}=0.3$, $w_{22}=0.4$ (to hidden neuron 2) Biases (hidden): $b_{h1}=0.1$, $b_{h2}=0.2$ Output weights: $v_1=0.5$, $v_2=0.6$ Output bias: $b_o=0.3$ Sigmoid: $f(x)=1/(1+e^{-x})$ Find the final output of the network.	4	5
Q4	Explain, with the help of an example, why single-layer networks can solve the AND problem but fail on XOR, motivating the need for multi-layer feedforward networks.	5	5
Q5	Discuss the various types of learning techniques in neural networks.	5	5

17