

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2025)

CLASS: BCA
BRANCH: BCA

SEMESTER: VI
SESSION: SP/2025

SUBJECT: CA369 DEEP LEARNING

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

Q.1(a)	Differentiate between Supervised & Unsupervised Classifier?	[2]	CO1	BL4
Q.1(b)	Explain the XOR problem and design a neural network to solve it?	[3]	CO1	BL6
Q.2(a)	Explain Overfitting and Underfitting using suitable diagrams?	[2]	CO1	BL2
Q.2(b)	Explain Bayesian Classifier?	[3]	CO1	BL2
Q.3(a)	Given a two-input neuron with the following parameters: bias=1.2; weight $w = [3 \ 2]$; input $p = [-5 \ 6]$. Calculate the neuron output for the transfer function log-sigmoid and hard-limit transfer function?	[2]	CO2	BL3
Q.3(b)	Describe the importance of regularization in neural network? Illustrate L1 & L2 regularization?	[3]	CO2	BL2
Q.4(a)	Describe two application areas where deep learning achieved great success?	[2]	CO2	BL2
Q.4(b)	Describe Gradient Descent Optimization and distinguish between Batch, Stochastic and Mini-Batch Gradient Descent?	[3]	CO2	BL4
Q.5(a)	Consider the classification problem defined below, where p are inputs and t are targets: {P1= [-1 1], t1=1} {P2= [-1 -1], t2=0} {P3= [1 -1], t3=1} {P4= [1 1], t4=0}; Design a neural network to solve the classification problem by applying perceptron learning rule with the initial weight and bias assumed to be 0?	[2]	CO3	BL6
Q.5(b)	Draw and explain a three-layer neural network with proper notations?	[3]	CO3	BL2

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