



Department of Computer Science & Engineering
Mid Semester Examination, Session 2024-25 (Odd)

Programme: B.Tech
Course Name: Neural Networks
Course Code: CS17311
Time: 1.5 HRS

Branch: B.Tech

Semester: VII

Max. Marks: 20

Registration No.:

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Instructions:

1. This paper has 4 questions and all questions are compulsory.
2. Be specific and to the point in your answers. Make assumptions wherever necessary and quote it.

- Q1 a Explain briefly different types of neural networks and their modeling?
b Suppose you have a dataset with the following features for 5 houses:

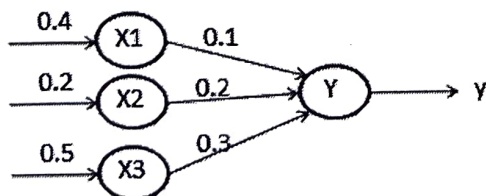
Marks (2+3)
Course Outcomes CO1,2,3
CO4,5

Size (sqft)	Bedrooms	Price (s)	Model Setup:	Weights Initialization:
1500	3	300	1. Input Layer: 2 neurons (Size, Bedrooms)	• Weights for input to hidden layer: ○ $w_{11}=0$, ○ $w_{12}=0$.
2000	4	400	2. Hidden Layer: 2 neurons (using ReLU activation)	○ $w_{21}=0.3$, ○ $w_{22}=0.4$
2500	4	500	3. Output Layer: 1 neuron (Price)	• Weights for hidden to output layer: ○ $w_{h1}=0.5$ ○ $w_{h2}=0.6$
3000	5	600		
3500	5	700		

with the model parameters given predict the price of house having Size = 1500, Bedrooms = 3

- Q2 a What is an activation function and why it is used in neural networks?
b Obtain the output y for the network shown below assuming softmax as activation function.

(2+3)
CO1,2,3
CO4,5



- Q3 a State and explain perceptron convergence theorem?
b Implement perceptron rule for logicalAND?

(2+3)
CO1,2,3
CO4,5

- Q4** a Explain briefly about Naïve Bayes classification?
b Consider a small dataset with the following data

(2+3) CO1,2,3
CO4,5

SI. No.	Color	Legs	Height	Smelly	Species
1	White	3	Short	Yes	M
2	Green	2	Tall	No	M
3	Green	3	Short	Yes	M
4	White	3	Short	Yes	M
5	Green	2	Short	No	H
6	White	2	Tall	No	H
7	White	2	Tall	No	H
8	White	2	Short	Yes	H

If the new data sample is consider $X = \{\text{Color=Green, Legs=2, Height=Tall, Smelly=No}\}$ find the probability that X belongs to Species M using Naïve Bayes?