

**VIT**Vellore Institute of Technology
(Approved as a University under section 3 of U.G. Act, 1956)

REG.NO.:

SLOT: A1 + Ta1

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026

Programme Name & Branch : BTech, SCOPE
Course Code and Course Name : BCSE209L and Machine Learning
Faculty Name(s) : Dr Arpan Garai, Dr Sanjiban Sekhar Roy, Dr Aarth S.L.
Class Number(s) : VL2025260102103, VL2025260102101, VL2025260102086
Date of Examination : 17-8-2025
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes: At the end of this course, student will be able to:
 1. Understand, visualize, analyze and preprocess the data from a real-time source.
 2. Apply appropriate algorithm to the data.
 3. Analyze the results of algorithm and convert to appropriate information required for the real - time application.
 4. Evaluate the performance of various algorithms that could be applied to the data and to suggest most relevant algorithm according to the environment.

Q. No	Question	M	CO	BL
1.	A. What do you mean by a hypothesis? Explain how it is relevant in training a machine learning model with a suitable example.	4	1	2
	B. Explain the role of accuracy (ϵ) and probability of failure (δ) in the probability approximately correct (PAC) learning with a suitable example.	6		
2.	Ravi buys a shirt each year. The prices of the shirt from 2021 to 2025 are given by 501, 585, 710, 795, 900, respectively. Help Ravi predict the price of the shirt in the next year (2026) using linear regression.	10	2	3
3.	What does 'K' stand for in the KNN algorithm? Draw the contrast of the effect on classification if 'K' is chosen too large or too small, with a proper example (consider a sample table of your own).	10	2	4
4.	Train a single-layer perceptron to perform similarly to an AND gate. Consider all the initial parameters and learning rate to be 0.5. Can a single-layer perceptron be applied to perform the same as an XOR gate? Justify your answer.	10	2	3
5.	Neha completed her master's degree at a reputed college. She has been working for the last eight years. Recently, she was promoted from a low income to a medium income level. She does not own a house; however, she wants to buy a car on her 32nd birthday. Consider the following table. Apply the Naïve Bayes Classifier to determine whether Neha should buy the car or not.	10	2	3



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Age	Gender	Income_Level	Owns_House	Education_Level	Should_Buy_Car			
25-35	Male	Medium	No	Bachelors	No			
35-45	Female	High	Yes	Masters	Yes			
45-55	Male	Low	No	HighSchool	No			
25-35	Female	Medium	Yes	Bachelors	Yes			
35-45	Male	High	Yes	PhD	Yes			
45-55	Female	Medium	No	Masters	No			
25-35	Male	Low	No	HighSchool	No			
35-45	Female	Medium	Yes	Bachelors	Yes			
45-55	Male	High	Yes	Masters	Yes			
25-35	Female	High	No	PhD	Yes			
