VIT
Vellore Institute of Technology
CHENNAI

Reg. Number:	24MCA1034

Continuous Assessment Test (CAT) – I Jan 2025

Programme	:	MCA	Semester	:	Winter Sem 24-25
Course Code & Course Title	:	PMCA507L – Machine Learning	Class Number	:	CH2024250501728
Faculty	:	Dr.B.Prakash	Slot	:	D1+TD1
Duration	:	90 minutes	Max. Mark		50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.

Answer all questions

Q. No	Sub Sec.	Description	Marks
1		Assume that you are working as a ML engineer in a leading 'e-commerce' based organization. You have been asked to elaborate the end-to-end life cycle of machine learning (ML) to the newly joined fresh graduates. Elaborate the process and discuss in detail about the phases involved in the same.	10
2		Over the 10 days of winter vacation, 'Sajay' recorded the number of hours he spent on using mobile on each day. **Hours per Day: 04, 05, 09, 06, 03, 12, 18, 05, 03, 09** Calculate low, median, high, lower quartile, upper quartile, interquartile range, and draw the box plot for the given data. (7 Marks). Analyse and highlight the inference for the given data (3 Marks).	10
3		The survey results of 6 online stores were taken. The relationship between the monthly e-commerce sales and the online advertising costs is given below. **Monthly sales (in lakhs)**: 275, 248, 540, 732, 224, 555 **Online Advertising cost (in lakhs)**: 1.6, 1.2, 2.5, 4.6, 1.3, 3.0 (a) Find the equation of the straight line that fits the data best. Illustrate the step-by-step procedure for forming the equation. (6 Marks) (b) Identify the association between them and predict the monthly sales for advertisement cost of 2.0 lakhs (4 Marks)	10
4		The following dataset represents the customers' product purchase decision (Yes / No) Vs. "No. of hrs. spent on the e-commerce website". Answer the following based on the implementation of "Logistic	10

Regression classifier" model. Assume the model suggested by optimizer for odds of purchasing the product is log (odds) = -42 +2 * hrs. spent.

Hrs. spent on e-commerce website	Product Purchase (Yes / No)
15	No
12	No
08	Yes
18	Yes
36	Yes

(a) Calculate the probability of customers who will purchase the product if he / she spent 30 hours in the e-commerce website. (5 Marks)

(b) Also, determine how many hours the customer should spend in the website that makes the customer will purchase the product with the probability of more than 90%. (5 Marks)

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Imagine you're predicting the number of car rentals per day in a city based on various weather conditions. Evaluate the performance of the regression model using MAE, MSE, RMSE, R-Squared (R^2), and adjusted R-Squared (R^2) error metrics.

Training Data:

Day	Rentals
1	160
2	190
3	180
4	210
5	195

Validation Data:

Day	Actual Rentals	Predicted Rentals
6	150	160
7	200	190

10

**********All the best **********