VIT
Vellore Institute of Technology
CHENNAI

Reg. Number:	

Continuous Assessment Test (CAT) – II March 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		Consider the following training data set for predicting whether the person has some disease or not. Estimate conditional probabilities using an appropriate classifier for the following disease prediction problem. Illustrate the step-by-step procedure for the same.	10

Fever	Cough	Fatigue	Shortness of breath	Disease
Yes	Yes	Yes	Yes	Yes
No	Yes	Yes	No	Yes
Yes	No	Yes	Yes	Yes
No	Yes	No	Yes	Yes
Yes	Yes	No	No	No
No	No	Yes	No	No
Yes	No	Yes	No	Yes
Yes	Yes	Yes	Yes	Yes
No	No	Yes	Yes	No
No	Yes	Yes	No	No

Classify the below test transaction data.

Fever	Cough	Fatigue	Shortness of breath	Disease
Yes	Yes	No	Yes	???

2		The company dataset given below has 10 instances. The company's profit is decided based on the age, competitive environment, and type of domain the people work on. Apply the ID3 algorithm and illustrate the step-by-step procedure to create a classification tree and derive the inferences that will help the company maintain a good profit. Refrain the iteration till 'max_depth=2' if the result is not achieved.	15

Age	Competition	Type	Class:Profit
Old	Yes	Software	No
Old	No	Software	No
Old	No	Hardware	No
Mid	Yes	Software	No
Mid	Yes	Hardware	No
Mid	No	Hardware	Yes
Mid	No	Software	Yes
Young	Yes	Software	Yes
Young	No	Hardware	Yes
Young	No	Software	Yes

3		Consider the Confusion Matrix for a binary classifier predicting whether customers will respond to a marketing campaign or not. The classifier made a total of 200 predictions, from which: • 50 customers who were predicted to subscribe and actually subscribed. • 20 customers who were predicted to subscribe but did not. • 100 customers who were predicted not to subscribe and did not. • 30 customers who were predicted not to subscribe but actually subscribed. Calculate Accuracy, precision, recall, F1-Score, mis-classification rate, True Positive Rate, True Negative Rate, False Positive Rate, and False Negative Rate.	10
4		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 Deep Learning (DL) to the newly joined fresh graduates. (i) Elaborate in detail about the steps involved in the training and optimization of neural networks (10 Marks). (ii)Highlight the various activation functions used in the neural networks (5 Marks).	15

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