Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII EXAMINATION – SUMMER 2025

Subject Code:3171114 Date:16-05-2025

Subject Name:Introduction of Machine learning

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	Define machine learning. Compare machine learning and traditional programming solution in terms of data, program and solution.	**03**
	(b)	Explain concept of hypothesis. Explain various terminologies used in hypothesis.	**04**
	(c)	Draw and explain terminologies related to decision tree. Enlist advantages and disadvantages of decision tree, as machine learning algorithm.	**07**
Q.2	**(a)**	Explain concept of over fitting with suitable examples.	**03**
	(b)	Draw and explain Schematic diagram of supervised learning.	**04**
	(c)	Take a suitable example and explain concept of "Linear Regression" with one variable.	**07**
		OR	
	(c)	What is dimensionality reduction? With the help of suitable examples, explain types of dimensionality reduction.	**07**
Q.3	**(a)**	Explain concept of Deep learning.	**03**
	(b)	Enlist limitations of Bayes classification.	**04**
	(c)	Explain logistic regression with necessary details.	**07**
		OR	
Q.3	**(a)**	Explain concept of Naïve Bayes classifier.	**03**
	(b)	Explain in brief concepts of Prior and Posterior in Bayes theorem with examples.	**04**
	(c)	Explain concept of support vectors. Draw and explain SVM model with necessary details.	**07**
Q.4	**(a)**	Enlist the basic architectures of neural network.	**03**
	(b)	Explain the role of activation function in neural network. Explain Sigmoid and linear activation function in details.	**04**
	(c)	Explain with necessary details basic perceptron learning algorithm.	**07**
		OR	
Q.4	**(a)**	Compare Soft Max and RELU as activation functions in deep neural network.	**03**
	(b)	Enlist useful properties and capabilities offered by neural networks.	**04**
	(c)	Explain in brief, back propagation learning algorithm with all the necessary steps.	**07**

Q.5	**(a)**	List down types of Ensemble learning algorithms.	**03**
	(b)	Define and explain in brief VC dimension in context of machine learning .	**04**
	(c)	Explain Hierarchical clustering with necessary details.	**07**

OR

Q.5	**(a)**	Explain bootstrap aggregation.	**03**
	(b)	Explain in brief concepts of 'dimensionality reduction' and 'feature selection'.	**04**
	(c)	Explain K-means clustering algorithm with necessary details.	**07**

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