Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2022

Subject Code:3170724 Date:16-01-2023

Subject Name:Machine Learning

Time:10:30 AM TO 01:00 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.**

			MARKS
Q.1	**(a)**	Define Machine learning and list out few applications in Engineering?	**03**
	(b)	Distinguish lazy vs eager learner with an example.	**04**
	(c)	Elaborate the cross validation in training a model.	**07**
Q.2	**(a)**	What is conditional probability? Define its importance.	**03**
	(b)	What is categorical data? Explain its types with examples.	**04**
	(c)	What is principal component analysis? How does it work? Explain.	**07**
		OR	
	(c)	What is model accuracy in reference to classification? Also Explain the performance parameters Precision, Recall and F-measure with its formula and example.	**07**
Q.3	**(a)**	Define the following terms. (i) Variance (ii) Covariance (iii) Joint Probability	**03**
	(b)	What is the purpose of Singular value decomposition? How does it achieve?	**04**
	(c)	Explain KNN algorithm with suitable example.	**07**
		OR	
Q.3	**(a)**	Explain posterior probability with its formula.	**03**
	(b)	Show various distance-based similarity measure with its example.	**04**
	(c)	Define feature and explain the process of transforming numeric features to categorical features with suitable example.	**07**
Q.4	**(a)**	What is Bernoulli distribution? Explain briefly with its formula.	**03**
	(b)	Explain the concept of Bayesian belief network.	**04**
	(c)	Explain decision tree approach with suitable example.	**07**
		OR	
Q.4	**(a)**	Mention few applications areas of unsupervised learning in Engineering.	**03**
	(b)	Define Entropy. Show its importance with suitable example.	**04**
	(c)	How does the apriori principle help in reducing the calculation overhead for a market basket analysis? Explain with an example.	**07**
Q.5	**(a)**	Briefly explain Perceptron and Mention its limitation.	**03**
	(b)	Define linear regression. Also explain Sum of squares with its formula.	**04**
	(c)	Explain k-means clustering technique.	**07**
		OR	
Q.5	**(a)**	What are the strengths and weaknesses of SVM?	**03**

(b)	Briefly explain K-Medoids.	**04**
(c)	Show the Step, ReLU and sigmoid activation functions with its equations and sketch.	**07**

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