Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA – SEMESTER III- EXAMINATION –WINTER-2022

Subject Code: 639402 Date: 28/12/2022

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.

Q.1 **(a)** Answer the following questions. **07**

(1) Define : Machine Learning
(2) What are the three parts in which machine learning process is divided?
(3) What is Euclidian distance? Write formula to calculate it.
(4) Write full form of PCA and explain it in brief.
(5) Which kind of learning algorithm skips the abstraction and generalization process?
(6) Write Bayes'probability rule.
(7) Which kind of learning is useful to find out patterns in data set?

(b) Answer TRUE/FALSE with justification **07**

(1) Interval and ratio attributes are discrete data.
(2) Overfitting the model means emulating training data too closely.
(3) K-nearest neighbor is a parametric machine learning algorithm.
(4) The probability that a particular hypothesis holds for a data set based on the Prior is called independent probability
(5) Hierarchical method is a type of clustering.
(6) Reinforcement learning model uses reward and punishment.
(7) Supervised learning is known as descriptive learning.

.

Q.2 **(a)** Explain the applicability of machine learning. Why machine learning is necessary to solve real world problems in real time? **07**

(b) Explain the machine learning activities in detail. **07**

OR

(b) Give comparative explanation of all three types of machine learning techniques by considering following points : **07**

1. When to use which model
2. Training data
3. Performance measure
4. Types of each model
5. Example algorithms
6. Applications

Q.3 **(a)** Explain basic types of data in machine learning. **07**

(b) Explain holdout and k-fold cross validation for supervised learning model. **07**

OR

Q.3 **(a)** Explain under fit, over fit and balanced fit. How it will affect bias – variance trade off? Explain it diagrammatically. **07**

	(b)	Explain feature transformation in detail with example.	**07**
Q.4	**(a)**	Explain decision tree algorithm in detail	**07**
	(b)	Explain linear regression model for prediction in detail.	**07**
		OR	
Q.4	**(a)**	Explain Bayes probability model with prior, posterior and likelihood in detail.	**07**
	(b)	Explain kNN algorithm with strength and weakness. Which is the popular application area of kNN?	**07**
Q.5	**(a)**	Explain K means algorithm in detail.	**07**
	(b)	Explain classification model steps using diagram.	**07**
		OR	
Q.5	**(a)**	What is clustering? Explain application areas in which clustering used.	**07**
	(b)	Explain market basket analysis using association rule.	**07**

****