

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER– VII EXAMINATION – SUMMER 2026****Subject Code:3170724****Date:20-05-2026****Subject Name: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.

		MARKS
Q.1	(a) What is well-posed learning problem?	03
	(b) Differentiate classification and regression.	04
	(c) Explain steps and activities to use machine learning for any real word application.	07
Q.2	(a) Define outliers in data. How to handle them?	03
	(b) Differentiate central tendency and data dispersion with simple examples.	04
	(c) Discuss different types of data in machine learning.	07
	OR	
	(c) Discuss holdout and k-fold cross validation for supervised learning.	07
Q.3	(a) Define central limit theorem.	03
	(b) Differentiate feature construction and feature extraction.	04
	(c) Discuss parametric distributions defined on discrete sample space.	07
	OR	
Q.3	(a) Define Bayes theorem.	03
	(b) Differentiate feature relevance and feature redundancy.	04
	(c) Discuss hypothesis testing in detail.	07
Q.4	(a) How to avoid overfitting in decision tree based classifier?	03
	(b) How to improve accuracy of a linear regression model?	04
	(c) Explain Naïve Bayes classifier with a simple example.	07
	OR	
Q.4	(a) How to identify correct hyperplane in SVM?	03
	(b) How to measure accuracy of a classification model?	04
	(c) Explain decision tree based classifier with a simple example.	07
Q.5	(a) Association rule mining is probabilistic method of unsupervised learning. True or False? Justify your answer.	03
	(b) In which applications does using deep learning provide significant performance improvements compared to traditional machine learning methods?	04
	(c) Compare various activation functions for neural networks along with their advantages and limitations.	07
	OR	
Q.5	(a) A significant increase in the number of hidden layers in a neural network is more likely to cause underfitting. True or False? Justify your answer.	03
	(b) How does reinforcement learning differ from supervised learning, and in what types of applications is reinforcement	04

- learning particularly useful?
- (c) Compare various clustering algorithms along with their advantages and limitations. **07**
