

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VII EXAMINATION – SUMMER 2026

Subject Code: 3171114

Date: 29-05-2026

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) What's the trade-off between bias and variance? **03**
(b) Compare: Overfitting and Underfitting. **04**
(c) Classify and explain different types of learning. **07**
- Q.2** (a) Compare: Decision Tree and Linear Regression **03**
(b) How is KNN different from k-means clustering? **04**
(c) What is a model in context of machine learning? How can you train a model? **07**
- OR**
- (c) Differentiate between linear regression and logistic regression. **07**
- Q.3** (a) What's the difference between Type I and Type II error? **03**
(b) Explain the difference between activation function and threshold function. **04**
(c) What is Bayes' Theorem? How is it useful in a machine learning context? **07**
- OR**
- Q.3** (a) Write down advantages and disadvantages of SVM. **03**
(b) List down application of Naïve Bayes classifier and explain any one in detail. **04**
(c) List down advantages and disadvantages of Bagging. **07**
- Q.4** (a) Explain McCulloch-Pitts model of neuron. **03**
(b) What is Backpropagation? List down advantages of using it in Neural Network. **04**
(c) Do Implementation of Perceptron Algorithm for AND Logic Gate with 2-bit Binary Input. **07**
- OR**
- Q.4** (a) List down different types of ensemble learning algorithm. **03**
(b) Compare: Artificial neuron and biological neuron. **04**
(c) Derive bound on number of training samples require for given accuracy, Define VC Dimension and Explain how to find its value using suitable example. **07**
- Q.5** (a) Write down different techniques for data preprocessing. **03**
(b) What is feature? Explain with the help of an example. **04**
(c) List down different types of clustering techniques and write down main characteristics of them. **07**
- OR**
- Q.5** (a) Can all the problems be solved using machine learning? Explain your response. **03**
(b) List down classification learning steps. **04**
(c) Write down different types of approach for feature selection and explain any of two. **07**
