

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2024****Subject Code:3171114****Date:22-05-2024****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.
- 5.

| | | MARKS |
|------------|---|--------------|
| Q.1 | (a) Differentiate between Dimensionality reduction and feature selection. | 03 |
| | (b) Explain the process of k-fold Cross Validation in brief. | 04 |
| | (c) Explain the principle of leave-one-out Cross-Validation (LOOCV) method. | 07 |
| Q.2 | (a) Briefly explain the principle of Collaborative Filtering. | 03 |
| | (b) State two types of distance metrics used in kNN. | 04 |
| | (c) Explain the principle of ensemble learning for decision tree. | 07 |
| | OR | |
| | (c) Discuss kNN model in detail. | 07 |
| Q.3 | (a) Write three types of approaches used for feature selection. | 03 |
| | (b) Discuss the advantages and disadvantages of using feature selection. | 04 |
| | (c) Explain Principle Component Analysis algorithm for Dimensionality Reduction. | 07 |
| | OR | |
| Q.3 | (a) Write any three key properties of SVM. | 03 |
| | (b) Discuss the advantages and disadvantages of using Bayesian learning. | 04 |
| | (c) Explain Naïve Bayes. | 07 |
| Q.4 | (a) State two types of kernel functions used in nonlinear SVM. | 03 |
| | (b) How can the use of soft margins in SVM can help to manage the presence of outliers and noise in data? | 04 |
| | (c) Explain the key components of a neural network. | 07 |
| | OR | |
| Q.4 | (a) Write applications of Support Vector Machine (SVM) classifier. | 03 |
| | (b) Explain the concept of margin in SVM. | 04 |
| | (c) Explain the principle of backpropagation algorithm. | 07 |
| Q.5 | (a) State two types of computational learning models. | 03 |
| | (b) Explain the difference between bagging and boosting. | 04 |
| | (c) Give at least six differences between clustering and classification. | 07 |
| | OR | |
| Q.5 | (a) Briefly explain the concept of Ensemble Learning. | 03 |
| | (b) Discuss advantages of using the VC dimension to measure the complexity of hypothesis space. | 04 |
| | (c) Explain the principle of agglomerative hierarchical clustering. | 07 |
