DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE
ARVIND GAVALI COLLEGE OF ENGINEERING, SATARA
EVEN SEM 2024-25
CA1 Examination

Course: B. Tech. **Class: TY** **Semester: VI**
Branch: CSE **Subject Code & Name: BTCOC603 Machine Learning**
Max Marks: 30 **Date:** **Duration: 01:30 Hrs**

Instructions to the Students:
(**1**) Illustrate your answers with neat sketches wherever necessary.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if necessary.
(4) Preferably, write the answers in sequential order.

Q.1 Objective type questions. (All questions are compulsory)

1.What is the primary advantage of cross-validation?CO1 1 Mark
A) It eliminates the need for training data
B) It ensures the model performs equally well on all datasets
C) It helps to reduce variance and assess model generalization
D) It prevents feature selection

2.What happens if a decision tree is too deep? CO1 1 Mark
A) It generalizes well to unseen data
B) It is more computationally efficient
C) It is more prone to overfitting
D) It has higher bias

3. In k-NN, what happens when we choose a very small value of k? CO1 1 Mark
A) The model is more sensitive to noise
B) The model generalizes better
C) The model ignores outliers
D) The model does not require distance calculation

4. Bayes' Theorem is used to compute: CO21 Mark
A) Prior Probability
B) Posterior Probability
C) Joint Probability
D) Probability Density Function

5.In logistic regression, the decision boundary is determined by: CO2 1 Mark
A) A linear equation
B) A polynomial equation
C) A clustering algorithm
D) A random process

6.What is the role of the hyper parameter C in an SVM model? CO2 1 Mark
A) It controls the complexity of the decision boundary
B) It determines the kernel function
C) It adjusts the number of support vectors
D) It prevents overfitting by normalizing data

Q .2 Solve Any two of the following.

A. Explain the concept of inductive bias and its role in machine learning. CO1 6 marks

B.What is overfitting, and how does it impact a model's performance? CO1 6 Marks

C. Explain the difference between feature selection and feature extraction.CO16 Marks

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Q. 3 Solve Any two of the following.

A.What is logistic regression, and how does it differ from linear regression?CO2 6 Marks

B. What is the difference between a hard-margin and soft-margin SVM? CO2 6 Marks

C.Why do we use cross-entropy loss instead of mean squared error (MSE) in logistic regression? CO2 6 Marks