

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B. Tech Mid Semester Exam**

**Semester: 6**  
**Subject Code: 203105399**  
**Subject Name: Machine Learning**

**Date: 03/02/2024**  
**Time: 02:30PM to 04:00PM**  
**Total Marks: 40**

Sr. No.		Marks
Q.1	(A) Five One Line Questions	05
1	What is the use of random state?	
2	Explain the concept of threshold in Classification?	
3	Define the term "Confusion Matrix" in the context of machine learning, and briefly explain its purpose in evaluating classification models.	
4	Why Training data should be more than test data in what is a fair split for Training and Test Data ?	
5	Explain regression providing a concise explanation of its primary objective.	
B		
1	The term _____ refers to the phenomenon where a machine learning model performs well on the training data but fails to generalize to new, unseen data.	
2	Gradient descent is an optimization algorithm used for _____ in machine learning.	
3	Ensemble models like bagging and boosting are techniques that combine multiple _____	
4	The process of converting multiple categorical variables into numerical representations in machine learning is called _____	
5	Precision, recall, and F1 score are examples of _____ used to evaluate classification models.	
Q.2	Attempt any four (Short Questions)	12
1	How does a decision tree algorithm work, and what is the role of entropy in the decision-making process?	
2	Explain the difference between batch gradient descent and mini-batch gradient descent.	
3	How does regularization help in improving the performance of a machine learning model?	
4	Describe the concept of cross-validation and why it is essential in model evaluation.	
5	What is the significance of the bias-variance tradeoff in the context of model performance, and how does it impact the generalization of a machine learning model?	
Q.3	Attempt any two questions	08
1	Explain classification and Regression metrics in brief.	
2	Briefly explain the steps involved in model tuning and the importance of hyperparameter tuning in machine learning.	

3	Discuss the significance of feature selection in machine learning and provide methods for performing it.	
Q.4	(A) Compulsory	05
	What is Ensembling ? Explain the difference between Bagging and boosting explain with appropriate algorithm	
	(B)	05
	Explain the working of XG-Boost and how it enhances the performance of gradient boosting in machine learning.	
	OR	
	(B)	
	Explain the process and benefits of K-fold cross validation. Additionally, discuss how it helps in model evaluation and selection.	05