

Code: 20EE4703E

IV B.Tech - I Semester – Regular Examinations - DECEMBER 2023

**MACHINE LEARNING
(ELECTRICAL & ELECTRONICS ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

			BL	CO	Max. Marks
UNIT-I					
1		Provide a concise definition of Machine Learning and explain its significance in the field of artificial intelligence. Highlight the core components involved in designing a learning system.	L2	CO1	14 M
OR					
2	a)	Explain the process of choosing an approximation algorithm for the target Function.	L2	CO1	7 M
	b)	Provide an overview of how Machine Learning is applied in enhancing the functionality of Search Engines. Discuss the algorithms and techniques that enable search engines to deliver more relevant results to users.	L2	CO1	7 M

UNIT-II					
3	a)	Provide an example to illustrate the process of pruning and its impact on a decision tree's structure and accuracy.	L3	CO2	7 M
	b)	Illustrate the strengths and weaknesses of the ID3 algorithm in the context of decision tree construction.	L3	CO2	7 M
OR					
4	a)	Interpret the concept of a Naive Bayes Classifier and provide a real-world example of its application.	L3	CO2	7 M
	b)	Explain the terms accuracy, precision, recall (sensitivity) and F-score.	L3	CO3	7 M
UNIT-III					
5	a)	Discuss a practical application where SVMs are particularly effective and why they are chosen over other algorithms.	L3	CO3	7 M
	b)	Compare and contrast Bagging and Boosting as ensemble methods in machine learning.	L3	CO3	7 M
OR					
6	a)	Produce the concept of Instance-Based Learning in machine learning.	L3	CO3	7 M
	b)	Illustrate the concept of Case-Based Reasoning (CBR) in machine learning. How does CBR work and what are its advantages in handling complex problem-solving tasks?	L3	CO3	7 M

UNIT-IV					
7	a)	Compare and contrast partition method k-means with hierarchical methods Agglomerative Algorithm.	L3	CO3	7 M
	b)	Describe the Apriori algorithm for frequent itemset generation. How does the Apriori algorithm efficiently find frequent itemsets in large datasets?	L3	CO3	7 M
OR					
8	a)	Explain the concept of the FP-Tree representation and how it simplifies the process of discovering frequent itemsets?	L3	CO3	7 M
	b)	Describe two cluster evaluation measures, Cohesion and Separation and the Silhouette Coefficient.	L3	CO3	7 M
UNIT-V					
9	a)	Analyze the role of exploration strategies in Q-learning and their impact on learning efficiency.	L4	CO4	7 M
	b)	Explain the key elements of reinforcement learning, including the learning task and its components.	L4	CO4	7 M
OR					
10	a)	Compare and contrast model-based learning methods such as Value Iteration and Policy Iteration in reinforcement learning.	L4	CO4	7 M

	b)	Analyze exploration strategies in reinforcement learning. Explain the challenges of balancing exploration and exploitation.	L4	CO4	7 M
--	----	---	----	-----	-----