R22 Regulation *Subject code:4E6FA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Regular/Supplementary Examinations, April 2026

MACHINE LEARNING

(IT)

Maximum Marks: 60 Date:18.04.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	List the types of Machine Learning.	1M	1	1
b)	What is overfitting?	1M	1	1
c)	What is an activation function in MLP?	1M	2	1
d)	What is learning rate?	1M	2	1
e)	Define bagging.	1M	3	1
f)	What is majority voting?	1M	3	1
g)	Define Dimensionality Reduction.	1M	4	1
h)	List the applications of genetic algorithm (GA).	1M	4	1
i)	Define Reinforcement Learning.	1M	5	1
j)	What is an agent in RL?	1M	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) Discuss bias-variance tradeoff. b) Illustrate the McCulloch and Pitts' mathematical model of a neuron.	5M 5M	1	2 2
	OR			
3	a) Analyze the Perceptron Learning Algorithm. b) Explain linear regression model with equation and example.	5M 5M	1	3 2
4	Explain the architecture of a Multi-Layer Perceptron (MLP) with a neat diagram. Describe the forward propagation process, explain the role of activation functions, and discuss the advantages and limitations of MLP.	10M	2	3
	OR			
5	What is a Support Vector Machine (SVM) and analyze and explain the Support Vector Machine Algorithm with example.	10M	2	3
6	Explain the structure and working of decision trees. Describe how entropy and information gain are used for splitting.	10M	3	2

	OR			
7	Analyze how ensemble methods improve model performance compared to single classifiers.	10M	3	3
8	Explain the need for dimensionality reduction and discuss different techniques used in machine learning.	10M	4	2
	OR			
9	What are Genetic Algorithms (Gas) and explain the shortest path optimization algorithm with an example.	10M	4	2
10	Explain the basic framework of Reinforcement Learning with suitable example.	10M	5	2
	OR			
11	Illustrate the "Getting Lost" example and explain how it models a reinforcement learning problem.	10M	5	3

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