R22 Regulation *Subject code:4E5GD&4E5HB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, April 2026

MACHINE LEARNING

(Common to CSE (AI&ML) & CSE(DS))

Maximum Marks: 60 Date:20.04.2026 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)	Define Concept Learning.	1M	1	BTL1
b)	List the issues of machine learning.	1M	1	BTL1
c)	What is Back Propagation Error?	1M	2	BTL1
d)	What is SVM?	1M	2	BTL2
e)	What is bagging?	1M	3	BTL1
f)	Show the major elements in K-means cluster algorithm.	1M	3	BTL2
g)	Compare LDA with PCA.	1M	4	BTL4
h)	What is Genetic algorithm.	1M	4	BTL3
i)	Outline about the Sampling.	1M	5	BTL2
j)	What is Tracking methods?	1M	5	BTL1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) Compare and contrast the 3 types of machine learning. b) Show the Find-S algorithm in machine learning with proper example.	5M 5M	1 1	BTL2 BTL1
	OR			
3	a) Interpret in detail about the components involved in Designing a Learning System. b) Design a Perceptron training model to implement the OR logic gate with weights w1=1, w2=1 and bias=-0.5.	5M 5M	1 1	BTL5 BTL6
4	a) Demonstrate the Single layer perception model with proper Diagram. b) Distinguish the Linear and Non-Linear Support Vector Machines in machine learning.	5M 5M	2 2	BTL2 BTL4
	OR			
5	a) What is the backpropagation algorithm, and why is it used? b) What is a Radial Basis Function (RBF)? What are the key components of RBF network?	5M 5M	2 2	BTL1 BTL1

6	a) Make use of CART algorithm working procedure with the neat sketch. b) List the major elements in K-Mean clustering algorithm with proper example.	5M 5M	3 3	BTL3 BTL1
	OR			
7	a) Explain the process of constructing a decision tree using any example. b) Explain Nearest Neighbor Methods.	5M 5M	3 3	BTL2 BTL4
8	a) Explain the steps involved in PCA and derive the mathematical formulation for finding principal components using eigen value decomposition. b) Apply genetic algorithms to solve a simple optimization problem and explain the output.	5M 5M	4 4	BTL4 BTL3
	OR			
9	a) Explain the need, role and features of principal Component Analysis. b) Illustrate the Isomap technique and discuss how it is used in non-linear dimensionality reduction.	5M 5M	4 4	BTL2 BTL2
10	a) Examine the working of Markov Chain Monte Carlo methods with suitable examples b) What are tracking methods in machine learning and describe how HMMs are used in tracking dynamic systems?	5M 5M	5 5	BTL4 BTL1
	OR			
11	a) Summarize Markov Random Fields in Reinforcement Machine Learning. b) Develop the Bayesian network model with proper example.	5M 5M	5 5	BTL4 BTL3