



R22 Regulation

Subject code:4E5GD&4E5HB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Regular/Supplementary Examinations, November 2025

MACHINE LEARNING

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

Maximum Marks: 60

Date: 22.11.2025

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 Machine Learning.		1M	1	BTL1
b)	List the perspectives of machine learning.		1M	1	BTL2
c)	Define perceptron with neat diagram.		1M	2	BTL2
d)	Define SVM.		1M	2	BTL2
e)	Write about Ensemble learning.		1M	3	BTL1
f)	What is Unsupervised Learning?		1M	3	BTL1
g)	Define Dimensionality Reduction.		1M	4	BTL2
h)	Define Isomap.		1M	4	BTL1
i)	Define Reinforcement Learning.		1M	5	BTL1
j)	What is the need of Bayesian networks.		1M	5	BTL2

Part-B

Answer All the following questions.		(5X10M=50Marks)	Marks	CO	Bloom Tx																																							
2	a) Design a Learning system with proper example. b) Explain about version spaces and Candidate elimination algorithm.		3M 7M	1 1	BTL1 BTL2																																							
OR																																												
3	a) Apply and find -S algorithm to a given example and find maximally specific hypothesis.		7M	1 1	BTL3 BTL1																																							
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Example</th> <th>sky</th> <th>Airtemp</th> <th>humidity</th> <th>Wind</th> <th>water</th> <th>forecast</th> <th>enjoysport</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>sunny</td> <td>warm</td> <td>normal</td> <td>strong</td> <td>warm</td> <td>Same</td> <td>Yes</td> </tr> <tr> <td>2</td> <td>sunny</td> <td>warm</td> <td>high</td> <td>strong</td> <td>warm</td> <td>Same</td> <td>Yes</td> </tr> <tr> <td>3</td> <td>rainy</td> <td>cold</td> <td>high</td> <td>strong</td> <td>warm</td> <td>Change</td> <td>No</td> </tr> <tr> <td>4</td> <td>sunny</td> <td>warm</td> <td>high</td> <td>strong</td> <td>cold</td> <td>change</td> <td>yes</td> </tr> </tbody> </table>	Example	sky	Airtemp	humidity	Wind	water	forecast	enjoysport	1	sunny	warm	normal	strong	warm	Same	Yes	2	sunny	warm	high	strong	warm	Same	Yes	3	rainy	cold	high	strong	warm	Change	No	4	sunny	warm	high	strong	cold	change	yes			
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	b) Define linear separability with suitable example.		3M																																									
4	a) Explain the multi-layer perception model with proper Diagram. b) Compare Radial Basis Function Networks with Multi-Layer Perceptron in terms of architecture and learning.		5M 5M	2 2	BTL2 BTL2																																							
OR																																												

5	Examine about four different kernel methods which are used in SVM in machine learning.	10M	2 2	BTL3 BTL3
6	a) Construct the Decision tree algorithm and explain about the ASM mechanism in machine learning. b) Classify the types of Probabilistic learning models.	6M 4M	3 3	BTL3 BTL3
OR				
7	a) How the two types of Weak learner's model are playing important role in Ensemble Learning in Machine learning? b) List out the types of Un-Supervised machine learning algorithms and explain about KNN algorithm.	5M 5M	3 3	BTL1 BTL3
8	What is the concept of genetic offspring in Gas and also list the main genetic operators in GAs.	10M	4 4	BTL1 BTL1
OR				
9	Explain how Linear Discriminant Analysis (LDA) improves class separability in a high dimensional dataset.	10M	4 4	BTL2 BTL4
10	a) What is sampling in machine learning? What are the different types of sampling techniques? b) Analyze Bayesian Networks and discuss how they represent probabilistic relationships between variables.	5M 5M	5 5	BTL1 BTL2
OR				
11	a) Illustrate the Markov Decision Processes in Reinforcement Machine Learning. b) Distinguish between Directed (Bayesian Networks) and Undirected (Markov Random Fields) graphical models.	5M 5M	5 5	BTL2 BTL2