R20 Regulation *Subject code: 3P5HC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, November 2025

MACHINE LEARNING

(CSE(DS))

Maximum Marks: 70 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 20 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 (10X2M=20 Marks)		Marks	CO	BTL
1	List the basic design issues to machine learning.	2M	1	L1
2	State version space representation theorem.	2M	1	L1
3	What is the representational power of perceptrons?	2M	2	L1
4	How to compute expected value and variance of a random variable?	2M	2	L1
5	What is Artificial Neural Network?	2M	3	L1
6	What do you mean by Gradient Descent?	2M	3	L1
7	Define Prior Probability.	2M	4	L1
8	What is conditional Independence?	2M	4	L1
9	What is Reinforcement Learning?	2M	5	L1
10	Define the sample error and true error.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Which disciplines have their influence on machine learning? Explain with examples.	10M	1	L2
	OR			
12	Illustrate the impact of over fitting in a typical application of decision tree learning.	10M	1	L2
13	Discuss how a multi layer network learns using a gradient descent algorithm.	10M	2	L2
	OR			
14	Explain the basic decision tree learning algorithm.	10M	2	L2
15	Draw the perceptron network with the notation. Derive an equation of gradient descent rule to minimize the error.	10M	3	L2
	OR			
16	Write an algorithm for back propagation algorithm which uses stochastic gradient descentmethod. Comment on the effect of adding momentum to the network.	10M	3	L2

17	Write Bayes theorem. What is the relationship between Bayes theorem and the problem of concept learning?	10M	4	L2
	OR			
18	Explain Naïve Bayes Classifier with an Example.	10M	4	L2
19	Explain an algorithm for regressing a set of literals through a single horn clause.	10M	5	L2
	OR			
20	Discuss the learning tasks and Q learning in the context of reinforcement learning.	10M	5	L2