R20 Regulation *Subject code: 3P5HC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Regular/Supplementary Examinations, February 2024

MACHINE LEARNING

(CSE(Data Science))

Maximum Marks: 70 Date:20.02.2024 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	CO	Bloom Tx
All the following questions carry equal marks (10X2M=20 Marks)			
1	Explain the importance of well-posed learning problems in the context of machine learning.	CO1	2
2	Define the concept of inductive bias and discuss its significance in the context of concept learning.	CO1	2
3	Describe the basic decision tree learning algorithm.	CO2	2
4	Explain the concept of inductive bias in decision tree learning.	CO2	2
5	Define Maximum Likelihood principle and its role in Bayesian learning.	CO3	1
6	Define the sample complexity for Finite Hypothesis Space in Computational Learning Theory.	CO3	2
7	Explain the Sequential Covering Algorithms in the context of learning sets of rules.	CO4	2
8	Define Analytical Learning in machine learning.	CO4	1
9	Discuss the motivation behind combining inductive and analytical learning approaches.	CO5	2
10	Define the Q Learning algorithm in reinforcement learning.	CO5	1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
11	Elaborate on the ethical considerations and challenges in designing a learning system. Discuss how these factors impact machine learning applications. [10]	CO1	4
	(OR)		
12	Analyze the limitations of the Find-S algorithm in handling complex concept learning tasks. Propose alternative approaches to address these challenges. [10]	CO1	4
13	Investigate advanced decision tree learning algorithms with an example.[10]	CO2	4
	(OR)		
14	Explain the limitations of back propagation in artificial neural networks. Propose innovative techniques to overcome these challenges. [10]	CO2	2

15	Evaluate the trade-offs between simplicity and accuracy in the Naïve Bayes classifier.[10]	CO3	4
	(OR)		
16	Examine the computational complexities associated with probability learning and approximately correct hypotheses in Computational Learning Theory. [10]	CO3	4
17	Critically evaluate the efficiency and scalability of the FOIL algorithm in learning sets of first-order rules, providing insights into its practical applications. [10]	CO4	4
	(OR)		
18	Explain the challenges and opportunities associated with Explanation-Based Learning (EBL) in the context of analytical learning. [10]	CO4	2
19	Investigate recent advancements in hybrid inductive-analytical learning models, emphasizing their effectiveness in addressing complex real-world problems. [10]	CO5	4
	(OR)		
20	Examine the ethical implications and challenges in deploying reinforcement learning systems, proposing strategies to ensure responsible and fair use in various applications. [10]	CO5	4