MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
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III B. Tech II Sem Supply End Examination, January 2023
Machine Learning
(Computer Science and Engineering)

Time: 3 Hours.   Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
   Each question carries 10 marks and may have a, b as sub questions.

PART- A
(10*2 Marks = 20 Marks)

1.	a)	What are the capabilities and limitations of ID3?	2M	CO1	BL1
	b)	Describe Reduced Error Pruning?	2M	CO1	BL2
	c)	Under what conditions the perceptron rule fails and it becomes necessary to apply the delta rule.	2M	CO2	BL1
	d)	Define Delta Rule.	2M	CO2	BL1
	e)	State Least Square Error Hypothesis.	2M	CO3	BL1
	f)	What is a Naïve Bayes Classifier? Give an Example.	2M	CO3	BL1
	g)	Justify the need for Genetic Programming in Learning?	2M	CO4	BL5
	h)	Write the applications of Q-Learning.	2M	CO4	BL1
	i)	Define the weakest preimage of a conclusion.	2M	CO5	BL1
	j)	Compare and contrast purely analytical and purely inductive learning	2M	CO5	BL2

PART- B
(10*5 Marks = 50 Marks)

2	a)	List the issues in Decision Tree Learning. Explain briefly how they are overcome.	5M	CO1	BL2
	b)	Discuss the following Decision tree learning issues in detail: (i) Avoiding over fitting in Decision Trees (ii) Handling Training Examples with Missing Attribute Values	5M	CO1	BL2

OR

3		What is the procedure of building Decision tree using ID3 with Gain and Entropy? Illustrate with example.	10M	CO1	BL2

4	a)	Design a two-input perceptron that implements the boolean function $A \wedge \neg B$ and also a two-layer network of perceptron's that implements A XOR B.	5M	CO2	BL6
	b)	Differentiate between Gradient Descent and Stochastic Gradient Descent	5M	CO2	BL2

OR

| 5 | Explain the following implementations of Back propagation algorithm :
(i)   Convergence and Local Minima
(ii)   Hypothesis Space Search and Inductive Bias | 10M | CO2 | BL4 |

| 6 | a) | Elaborate the concepts of:
(i)   Prior Probability
(ii)   Conditional Probability
(iii) Posterior Probability | 5M | CO3 | BL4 |

b) Consider the training data in the following table where Play is a class attribute. In the table, the Humidity attribute has values "L" (for low) or "H" (for high), Sunny has values "Y" (for yes) or "N" (for no), Wind has values "S" (for strong) or "W" (for weak), and Play has values "Yes" or "No".What is class label for the following day (Humidity=L, Sunny=N, Wind=W), according to naïve Bayesian classification?   5M   CO3   BL3

Humidity	Sunny	Wind	Play
L	N	S	No
H	N	W	Yes
H	Y	S	Yes
H	N	W	Yes
L	Y	S	No

OR

| 7 | Describe K-nearest Neighbour learning Algorithm for continues valued target function. Discuss the major drawbacks of K-nearest Neighbour learning Algorithm and how it can be corrected. | 10M | CO3 | BL2 |

| 8 | a) | Explain Rank based selection using Genetic Algorithm. | 5M | CO4 | BL2 |
| | b) | Discuss in detail about the genetic mechanisms and models of evolution in learning. | 5M | CO4 | BL2 |

OR

| 9 | What is Reinforcement Learning and explain Reinforcement learning problem with neat diagram | 10M | CO4 | BL4 |

| 10 | a) | "Explanation determines feature relevance." Substantiate this statement with respect to explanation based learning. | 5M | CO5 | BL3 |
| | b) | Demonstrate the EBNN algorithm | 5M | CO5 | BL3 |

OR

| 11 | List the main properties of PROLOG-EBG algorithm? Is it deductive or inductive? Justify your answer. | 10M | CO5 | BL5 |

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