Course Code: 2050518 Roll No: **MLRS-R20**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

III B.Tech I Sem Regular End Examination, December 2022

Machine learning

(CSD/CSM)

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 is Machine learning? What is the need of it?	2M	CO1	BL1
	b)	List the issues in decision tree learning?	2M	CO1	BL1
	c)	What is Artificial Neural Network?	2M	CO2	BL1
	d)	Show the feed forward representation of the multilayer networks?	2M	CO2	BL3
	e)	State Baye's theorem?	2M	CO3	BL1
	f)	Discuss Maximum Likelihood and Least Square Error Hypothesis.	2M	CO3	BL2
	g)	List the factors motivated the popularity of genetic algorithms.	2M	CO4	BL1
	h)	Write the Sequential Covering algorithm for learning a disjunctive set of rules?	2M	CO4	BL1
	i)	Describe Analytical Learning?	2M	CO5	BL2
	j)	Define Approximate inductive bias of PROLOG-EBG?	2M	CO5	BL1

PART- B

(10*5 Marks = 50 Marks)

2 a) Write FIND-S algorithm and explain with example given below? 6M CO1 BL3

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	Cool	Change	Yes

b) What are the key properties and complaints of FIND-S algorithm? 4M CO1 BL1

OR

3 a) Write LIST-THEN-ELIMINATE algorithm? 4M CO1 BL1

b) Write the final version space for the below mentioned training examples using candidate elimination algorithm? 6M CO1 BL3

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sports	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive
Japan	Toyota	Green	1980	Economy	Positive
Japan	Honda	Red	1990	Economy	Negative

4	a)	Design a two-input perceptron that implements the boolean function A Λ ¬ B. Design a two-layer network of perceptron's that implements A XOR B?	5M	CO2	BL6
	b)	Describe the general approach for deriving confidence intervals?	5M	CO2	BL2
		OR			
5	a)	Explain the remarks on the back propagation algorithm?	5M	CO2	BL4
	b)	How a single perceptron can be used to represent the Boolean functions such as AND,OR?	5M	CO2	BL1
6	a)	Consider a medical diagnosis problem in which there are two alternative hypotheses: 1.that the patient has a particular form of cancer (+) and 2. That the patient does not (-). A patient takes a lab test and the result comes back positive. The test returns a correct positive result in only 98% of the cases in which the disease is actually present, and a correct negative result in only 97% of the cases in which the disease is not present. Furthermore, .008 of the entire population have this cancer. Determine whether the patient has Cancer or not using MAP hypothesis.	5M	CO3	BL3
	b)	Explain the concept of EM Algorithm. Discuss what are Gaussian Mixtures?	5M	CO3	BL4
		OR			
7	a)	Define is Maximum a Posteriori (MAP) Maximum Likelihood (ML) Hypothesis. Derive the relation for h_{MAP} and h_{ML} using Bayesian theorem?	5M	CO3	BL6
	b)	Demonstrate k-nearest neighbour algorithm for classification?	5M	CO3	BL5
8	a)	Explain the Q function and Q Learning Algorithm assuming deterministic rewards and actions with example.	5M	CO4	BL4
	b)	Write Reinforcement learning problem characteristics?	5M	CO4	BL1
		OR			
9	a)	Illustrate genetic algorithm with an example.	6M	CO4	BL4
	b)	Illustrate the basic FOIL algorithm?	4M	CO4	BL4
10	a)	Illustrate Inductive-Analytical approaches to learning?	4M	CO5	BL4
	b)	"Explanation determines feature relevance." Substantiate this statement with respect to explanation based learning?	6M	CO5	BL4
		OR			
11	a)	Explain learning with perfect domain theories with example?	6M	CO5	BL4
	b)	Discuss on remarks on EBL?	4M	CO5	BL2

---oo0oo---

CO - Course Outcome **BL - Blooms Taxonomy Levels**