Hall Ticket Number:

Code No. : 16118 (H)

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (CBCS) VI-Semester Main Examinations, January-2021

Introduction to Machine Learning

(Open Elective-V)

Time: **2** hours Max. Marks: **60**

*Note: Answer any **NINE** questions from **Part-A** and any **THREE** from **Part-B***

Part-A (9 × 2 = 18 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Define Reinforcement Learning.	2	1	1	1
2.	Distinguish between Linear Regression and Logistic Regression.	2	2	1	1
3.	Differentiate between Classification and Clustering.	2	2	2	1
4.	Define a Decision Tree. Give an example.	2	1	2	1
5.	State the drawbacks of a single-layer Perceptron.	2	1	3	1
6.	Mention any two applications of Multilayer Neural Networks.	2	1	3	1
7.	Define Bayes rule.	2	1	4	1
8.	What is the significance of Naïve Bayes Classification?	2	1	4	1
9.	Mention the strengths of Agglomerative Hierarchical Clustering.	2	1	5	1
10.	List the weaknesses of K-means clustering algorithm.	2	1	5	1
11.	List the sub-areas of Artificial Intelligence.	2	1	1	1
12.	List the characteristics of problems that Decision Tree Learning is best suited to.	2	1	2	1
	Part-B (3 × 14 = 42 Marks)				
13. a)	Compare Supervised Learning, Unsupervised Learning and Reinforcement Learning.	6	2	1	1
b)	Discuss in detail about the applications of Artificial Intelligence.	8	1	1	1
14. a)	Discuss the k-Nearest Neighbor concept using an example.	7	1	2	1
b)	Assume S is a collection containing 20 training example days, [12+, 8-] described by attributes including 'Wind', which can have values 'Weak' and 'Strong'. Of these examples, assume that 8 of the positive and 4 of the negative examples have Wind = Weak and the remainder have Wind = Strong. Find the Entropy and Information Gain of S.	7	3	2	1,2
15. a)	Design a Perceptron for AND Boolean function and explain how it works.	8	3	3	1,2
b)	Discuss the advantages of using Backpropagation over Multilayer Feed Forward Neural Networks.	6	2	3	1

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16. a)	Discuss in detail about the advantages of using Bayesian Belief Networks.	6	1	4	1
b)	Draw the Bayesian belief network that represents the conditional independence assumptions of the naive Bayes classifier for the ***PlayTennis*** problem. Give the conditional probability table associated with the node ***Wind.***	8	3	4	1,2
17. a)	Compare Hierarchical Clustering with Partitional Clustering.	7	1	5	1
b)	Consider the mean of a Cluster of objects from a binary transaction set. What are the minimum and maximum values of the components of the mean? What is the interpretation of components of the cluster mean? Which components must accurately characterize the objects in the cluster?	7	3	5	1,2
18. a)	Discuss the applications of Classification and Clustering.	7	2	1	1
b)	Discuss the advantages of using Decision Trees, using an example.	7	1	2	1
19.	Answer any ***two*** of the following:				
a)	Discuss the advantages of using Multilayer Neural Networks.	7	1	3	1
b)	Write and explain the Naïve Bayes Algorithm for learning and classifying text.	7	2	4	1
c)	Discuss how points are classified in Center-Based Density in DBSCAN.	7	1	5	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	50
2	Knowledge on application and analysis (Level-3 & 4)	50
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	0

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