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Code No. : 16147 (F) N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. VI-Semester Main & Backlog Examinations, May/June-2023

Introduction to Machine Learning (OE-IV)

(Common to EEE & ECE)

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	List sub areas of AI?				
2.	What is a classification problem?	2	1	1	1
3.	Explain the difference between the CART and ID3 Algorithms.	2	2	1	1
4.	List down the attribute selection measures used by the ID3 algorithm to construct a Decision Tree.	2	2	2	1
5.	Define Perceptron.	2	1	2	1
6.	What is the drawback of a single layer perceptron?	2	1	3	1
7.	What is Support Vector Machine?	2	2	3	1
8.	Define Bayes rule.	2	1	4	1
9.	List different types of Clustering.	2	1	4	1
10.	Differentiate between supervised and unsupervised learning?	2	1	5	1
	Part-B (5 × 8 = 40 Marks)	2	3	5	2
11. a)	What is the difference between Linear and Logistic regression and explain with an example.	4	2	1	1
b)	Illustrate the significance of NumPy along with an example program.	4	3	1	2
12. a)	Explain KNN Algorithm?	2	1	2	1
b)	Suppose you have given the following 2-class data where "+" represent a positive class and "-" is represent negative class. you are now want to use k-NN(k=3), and predict the class for x=5 and y=4?	6	3	2	2
13. a)	What is gradient descent and delta rule?	2	2	3	1
b)	Describe multilayer neural network. Explain why back propagation algorithm is required.	6	2	3	2

14. a) Explain Naïve Bayes Classification.
 b) For the data below, predict the output for the following new instance using Naïve Bayes algorithm.

X: (Weather =Sunny; Humidity=Normal; Wind= Weak)

Day	Weather	Humidity	Wind	Play Tennis?
1	Sunny	High	Weak	No
2	Cloudy	High	Weak	Yes
3	Sunny	Normal	Strong	Yes
4	Cloudy	High	Strong	Yes
5	Rainy	High	Strong	No
6	Rainy	Normal	Strong	No
7	Rainy	High	Weak	Yes
8	Sunny	High	Strong	No
9	Cloudy	Normal	Weak	Yes
10	Rainy	High	Strong	No

2 2 4 1
 6 4 4 2

15. a) Explain DBSCAN algorithm for density-based clustering.
 b) Apply DBSCAN algorithm on the below dataset to find out clusters by taking $eps = 2$ and $MinPts = 3$.

Subject	A	B
P1	2	10
P2	2	5
P3	8	4
P4	5	8
P5	7	5
P6	6	4

2 1 5 1
 6 3 5 2

16. a) What is the difference between Supervised and unsupervised leaning, explain with examples? Compare these with Reinforcement learning?

4 2 1 2

- b) Write down Logistic Regression algorithm explaining all the steps.

4 2 2 2

17. Answer any **two** of the following:

4 2 3 1

- a) Explain the details of Perceptron algorithm and its limitation of XOR problem?

4 3 4 2

- b) Describe the significance of Kernel functions in SVM. List any two kernel functions.

4 4 5 2

- c) Given the following data set consisting of the scores of two variables A & B on each of six individuals: Predict 2 clusters using k-means algorithm?

Subject	A	B
1	1.0	1.0
2	1.5	2.0
3	3.0	4.0
4	5.0	7.0
5	3.5	5.0
6	4.5	5.0

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

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%
