b. Detail the performance metrics for evaluating a classifier machine learning model. Take through with data FP = 10, TP = 50, TN = 100, FN = 5. | 10 | 3 | 2 | 5

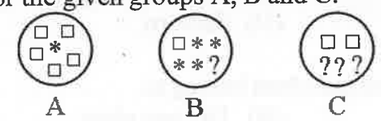
28. a. Apply dimensionality reduction employing the principal component analysis. Map the following 2D to 1D. | 10 | 3 | 3 | 2

X_1	2	3	4	5	6	7
X_2	1	5	3	6	7	8

(OR)

b. Perform support vector machine SVM hard margin and soft margin classifier in obtaining optimal separating hyper plane. | 10 | 3 | 3 | 2

29. a. Evaluate the clustering method using any three parameters. Consider suitable measures for the given groups A, B and C. | 10 | 4 | 4 | 5



(OR)

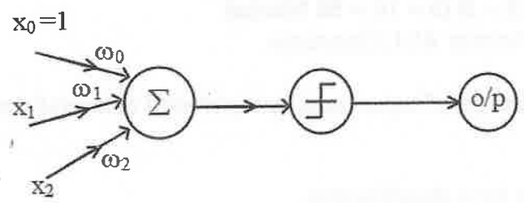
b. Compute the distance matrix (a) employ Euclidean distance (b) Manhattan distance. | 10 | 4 | 4 | 5

Sl.no	A	B	C	D
x	0	2	3	1
y	2	0	1	1

30. a. Write about decision tree. Enumerate the issues in decision tree learning. | 10 | 3 | 5 | 3

(OR)

b.



(i) Analyse the output if
$\omega_0 = -0.8$
$\omega_1 = 0.5$
$\omega_2 = 0.5$ | 5 | 4 | 5 | 5

(ii) Analyse the output if
$\omega_0 = -0.3$
$\omega_1 = 0.5$
$\omega_2 = 0.5$

(iii) Write detailed note on perceptron training rule. | 5 | 4 | 5 | 5

* * * * *

Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2022
Sixth Semester

18CSE392T – MACHINE LEARNING – I
(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours | Max. Marks: 75

PART – A (25 × 1 = 25 Marks) | Marks | BL | CO | PO
Answer **ALL** Questions

1. Which one of the following is a non-parametric algorithm? | 1 | 1 | 1 | 1
(A) Decision tree (B) K-nearest neighbours
(C) Linear regression (D) Support vector machine

2. Which one of the following is a sigmoid function? | 1 | 1 | 1 | 1
(A) $f(z) = \frac{1}{1+e^{-z}}$ (B) $f(z) = 1+e^{-z}$
(C) $f(z) = \frac{1}{1+e^{z}}$ (D) $f(z) = \frac{1}{1-e^{-z}}$

3. Given C = 2 and its class values are $y \in \{0,1\}$. Identify the type of classification. | 1 | 2 | 1 | 1
(A) Binary classification (B) Multi-label classification
(C) Multi-class classification (D) Multi-level classification

4. If a data set has 'K' features, then how many data points is required for requirement of 10 data points for any combination of features | 1 | 2 | 1 | 1
(A) $2^K \times 10$ (B) 2^{K+10}
(C) $2^{10} \times K$ (D) K features

5. The main purpose of learning curve is to | 1 | 2 | 1 | 1
(A) Visualize the performance of accuracy with training size (B) It is a confusion matrix
(C) Understand the supervised learning (D) Find suitability of ML model for a particular application

6. Pick the library which is not a part of python. | 1 | 2 | 2 | 3
(A) Numpy (B) Linear program
(C) Tensor flow (D) Scikit learn

7. Linear regression is to model | 1 | 2 | 2 | 3
(A) Linear relationship between variables (B) Polynomial relationship
(C) Exponential relationship (D) Non-linear relationship

8. Formula for residual (sum of square error) is — 1 1 2 3

(A) $SS_{res} = \sum_{i=1}^{n} (y_i - f(x_i))^2$ (B) $SS_{res} = |f(x_i) - y_i|$

(C) $SS_{res} = |f(x_i) - y_i|^2$ (D) $SS_{res} = y - f(x)$

9. Range of R^2-value is — 1 1 2 3

(A) Between 0 and 1 (B) Between –1 and 1

(C) Between –1 and 0 (D) Below 0

10. Compute distance between — 1 2 2 3

$d_1 = [0, 1, 1, 1, 0, 0, 0, 0]$ $d_2 = [1, 0, 0, 0, 0, 0, 1, 0]$

(A) 2.2 (B) 2

(C) $\sqrt{2}$ (D) 0

11. Ridge regression equation is — 1 1 3 5

(A) $\sum_{i=1}^{n} \left(y_i - x_i^T \beta\right)^2 + \lambda \sum_{j=1}^{p} \beta_j^2$ (B) $\left(y_i - x_i^T \beta\right)^2$

(C) $\sum_{i=1}^{n} \left(y_i - x_i^T \beta\right)^2$ (D) $\sum_{j=1}^{p} \beta_j^2$

12. Dimensionality reduction is — 1 2 3 5

(A) A pre-processing step for removal of unnecessary information (B) Feature choice

(C) Classifier problem (D) Text processing

13. Kernel trick is associated with — 1 2 3 5

(A) KNN (B) SVM

(C) Supervised learning (D) Unsupervised learning

14. The term $P(Ci / X)$ is the — 1 2 3 5

(A) A priori probability (B) Class density

(C) Class priori (D) Posterior probability

15. Naive Bayesian classifier is simplified version of — 1 2 3 2

(A) Baye's classifier (B) SVM classifier

(C) Logisitic classifier (D) PCA

16. Clustering is a — 1 1 4 5

(A) Supervised machine learning (B) Unsupervised machine learning

(C) Reinforcement learning (D) Instant based learning

17. Generalized form of Euclidean and Manhattan distance is — 1 1 4 5

(A) City block distance (B) Minkowski distance

(C) Manhattan distance (D) Squared distance

18. Complexity of partitional clustering N is data size, D is number of features — 1 2 4 5

(A) $O(N^2)$ (B) $O(ND)$

(C) $O(N^2 \log N)$ (D) $O(\log N)$

19. Identify the bottom-up clustering — 1 1 4 5

(A) Agglomerative clustering (B) Divisive clustering

(C) Feature based clustering (D) Felt clustering

20. Metrics used for clustering method — 1 2 4 5

(A) Purity (B) Rand index

(C) SS error (D) Both (A) and (B)

21. Learning function is represented by a tree in — 1 1 5 5

(A) Decision tree (B) Bayesian classifier

(C) Clustering (D) Linear regression

22. Identify which is not a decision tree algorithm. — 1 1 5 5

(A) ID3 (B) C4.5

(C) CART (D) Entropy

23. Entropy value of 0 indicates all members belong to — 1 2 5 5

(A) Same class (B) Dis join class

(C) Inter class (D) Different class

24. Basic unit of neural network — 1 2 5 5

(A) Perception (B) Decision tree

(C) CART (D) Mart

25. XOR function cannot be implemented by — 1 2 5 5

(A) Single perceptron (B) Multiple perceptron

(C) Back propagation (D) Decision tree

PART – B (5 × 10 = 50 Marks)

Answer **ALL** Questions

Marks BL CO PO

26. a.i. Analyze the salient features of supervised, unsupervised and reinforcement learning. — 5 4 1 1

ii. Apply KNN algorithm for a classification. — 5 3 1 1

(OR)

b.i. Analyse the impact of bias and variance for a machine learning model to be over fitted and under fitted. — 5 4 1 1

ii. What is cross validation? Draw pictorial representation for a dataset 80 with cross validation CV = 4. — 5 4 1 1

27. a. Given the data, apply the curve fit to find the functional mapping $\hat{f}(x)\ (or)\hat{y}$. — 10 3 2 3

x	6	8	10	14	18
y	7	9	13	17.5	18

(OR)