



C20-AIM-405

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**BOARD DIPLOMA EXAMINATION, (C-20)**  
**OCTOBER/NOVEMBER—2023**  
**DAIM – FOURTH SEMESTER EXAMINATION**  
**FUNDAMENTALS OF MACHINE LEARNING**

Time : 3 hours ]

[ Total Marks : 80

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**PART—A**

3×10=30

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. What is machine learning?
2. List types of data for data modeling.
3. Write about clustering.
4. What is conditional probability? Give an example.
5. List any three applications of supervised learning.
6. Write any three strengths of the decision tree method.
7. What is entropy?
8. List any three applications of un-supervised learning.
9. Write any three strengths of K-Means algorithm.
10. Write any three differences between supervised learning and un-supervised learning.

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **eight** marks.  
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

**11.** (a) Explain different types of Machine Learning.

**(OR)**

(b) Explain applications of Machine Learning.

**12.** (a) Explain the Data Pre-Processing in Machine Learning.

**(OR)**

(b) Explain the following in Machine Learning :

(i) Classification

(ii) Regression

**13.** (a) Explain the Naïve Bayes Classifier Algorithm.

**(OR)**

(b) Describe the concept of Prior, Posterior and Likelihood in Bayes Theorem.

**14.** (a) Describe classification learning steps in supervised learning.

**(OR)**

(b) Explain Simple Linear Regression Algorithm with an example.

**15.** (a) Explain different types of clustering techniques.

**(OR)**

(b) Describe Apriori algorithm in un-supervised learning.

**PART—C**

10×1=10

- Instructions :** (1) Answer the following question.  
(2) The question carries **ten** marks.  
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 16.** Cluster the following eight points (with  $x, y$  representing locations) into three clusters : A1 (2, 10), A2 (2, 5), A3 (8, 4), A4 (5, 8), A5 (7, 5), A6 (6, 4), A7 (1, 2), A8 (4, 9). Initial cluster centers are : A1 (2, 10), A4 (5, 8) and A7 (1, 2). The distance function between two points  $a = (x_1, y_1)$  and  $b = (x_2, y_2)$  is defined as  $P(a, b) = |x_2 - x_1| + |y_2 - y_1|$ . Use K-Means Algorithm to find the three cluster centers after the second iteration.

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