# 1904M118

Candidate's Seat No :_____

**Integ. M.Sc AIML Semester-6 Examination**

**CC-313**

**Unsupervised Machine Learning**

**April-2024**

**Time : 2-30 Hours]** **[Max. Marks : 70**

**Instructions:** All questions are compulsory. Use of non-programmable scientific calculator is allowed.

**Q.1** **(a)** Explain in detail what is unsupervised learning? (07)

**(b)** Discuss the advantages and disadvantages of Unsupervised Learning in the context of machine learning applications. (07)

**OR**

**(a)** Describe the working principle of Unsupervised Learning, illustrating with a step-by-step example. (07)

**(b)** Explain in detail types of unsupervised learning. (07)

**Q.2** **(a)** Provide a detailed explanation of at least three distinct distance measures commonly used in Unsupervised Learning algorithms (07)

**(b)** Explain in detail mean shift clustering algorithms and also discuss its pros and cons. (07)

**OR**

**(a)** Explain importance of dimension reduction. And also discuss its technique in detail. (07)

**(b)** Explain in detail K-means clustering algorithms and also discuss its pros and cons. (07)

**Q.3** **(a)** Discuss the implementation of Hierarchical Clustering algorithm and also discuss the term Agglomerative and Divisive. (07)

**(b)** Explain in detail DBSCSAN Clustering Algorithm. (07)

**OR**

**(a)** Create a Dendrogram from given Distance matrix. (07)

| | A | B | C | D |
|---|---|---|---|---|
| A | 0 | 3 | 4 | 2 |
| B | 3 | 0 | 5 | 1 |
| C | 4 | 5 | 0 | 6 |
| D | 2 | 1 | 6 | 0 |

**(b)** Discuss the pros and cons of Hierarchical Clustering algorithm and DBSCAN Clustering Algorithm. (07)

**Q.4** **(a)** Explain how Unsupervised Learning techniques can be applied to improve decision-making processes in marketing. (07)

**(b)** Explain how Unsupervised Learning techniques were applied to analyze the data and derive meaningful insights. (07)

**OR**

(P.T.O.)

(a) Evaluate the advantages and challenges of employing Unsupervised Learning methods in marketing and customer service domains. **(07)**

(b) Describe how marketing team could utilize Unsupervised Machine Learning techniques for audience segmentation. Outline the key steps involved in the audience segmentation process. **(07)**

Q.5 Attempt any **SEVEN** out of **TWELVE:** **(14)**

(1) Define: Clustering

(2) Define: Association

(3) Full Form of PCA and LDA.

(4) Full Form of DBSCAN.

(5) Define: Complete Linkage with diagram

(6) What are the types of unsupervised learning?

(7) How we can define the value of K in K-means?

(8) What is the default number of cluster in K-means?

(9) Different between PCA and LDA.

(10) Define: Centroid Linkage with diagram

(11) Define: Linear Discriminant Analysis

(12) Point A : $(x_1, y_1) = (3,4)$
Point B : $(x_2, y_2) = (6,8)$
Calculate the Manhattan Distance.

**** ****