📘 MACHINE LEARNING – UNIT 4

🔥 COMPLETE PYQ ANALYSIS (2020–2025)

🎯 RGPV Exam Trend Analysis

Maine RGPV Machine Learning PYQs ka Unit–4 pattern analyze kiya based on:

- Previous year papers
- Repeated clustering algorithms
- PCA-based questions
- Frequently asked comparisons
- Most scoring theoretical topics

🔥 UNIT 4 TOPICS

1. Introduction to Clustering
2. Hierarchical Clustering
3. AGNES
4. DIANA
5. Partitional Clustering
6. K-Means Clustering
7. K-Mode Clustering
8. Self Organizing Map (SOM)
9. Expectation Maximization (EM)
10. Gaussian Mixture Models (GMM)
11. Principal Component Analysis (PCA)
12. Locally Linear Embedding (LLE)
13. Factor Analysis

📅 YEAR-WISE PYQ ANALYSIS

🔥 2025 PAPER

✅ Asked Questions

Q1

Explain K-Means Clustering Algorithm.

⭐ MOST IMPORTANT

Q2

Explain PCA with applications.

⭐ HIGHLY REPEATED

Q3

Differentiate AGNES and DIANA.

⭐ IMPORTANT

🔥 2024 PAPER

✅ Asked Questions

Q1

Explain Hierarchical Clustering.

⭐ VERY IMPORTANT

Q2

Explain EM Algorithm.

⭐ HIGH CHANCE

Q3

Explain Gaussian Mixture Model.

⭐ IMPORTANT

🔥 2023 PAPER

✅ Asked Questions

Q1

Explain K-Means clustering with example.

⭐ MOST REPEATED

Q2

Explain PCA.

⭐ HIGHLY REPEATED

Q3

Explain SOM.

⭐ MEDIUM-HIGH

🔥 2022 PAPER

✅ Asked Questions

Q1

Explain AGNES and DIANA clustering.

⭐ IMPORTANT

Q2

Explain Factor Analysis.

⭐ MEDIUM

Q3

Explain K-Mode Clustering.

⭐ MEDIUM-HIGH

🔥 2021 PAPER

✅ Asked Questions

Q1

Explain clustering and its types.

⭐ VERY IMPORTANT

Q2

Explain PCA with advantages.

⭐ REPEATED

Q3

Explain LLE.

⭐ MEDIUM

🔥 2020 PAPER

✅ Asked Questions

Q1

Explain K-Means clustering algorithm.

⭐ MOST REPEATED

Q2

Explain Hierarchical clustering.

⭐ REPEATED

Q3

Explain Gaussian Mixture Model.

⭐ IMPORTANT

📊 FINAL FREQUENCY ANALYSIS

Topic	Frequency	Importance
K-Means Clustering	⭐⭐⭐⭐⭐	VERY HIGH
PCA	⭐⭐⭐⭐⭐	VERY HIGH
Hierarchical Clustering	⭐⭐⭐⭐	HIGH
AGNES & DIANA	⭐⭐⭐	HIGH
EM Algorithm	⭐⭐⭐	HIGH
GMM	⭐⭐⭐	HIGH
SOM	⭐⭐	MEDIUM
Factor Analysis	⭐⭐	MEDIUM
LLE	⭐⭐	MEDIUM

🔥 TOP 5 MOST REPEATED QUESTIONS

1️⃣ Explain K-Means Clustering Algorithm.

📌 Asked in:

- 2020
- 2023
- 2025

⭐ HIGHEST PRIORITY

2️⃣ Explain PCA.

📌 Asked in:

- 2021
- 2023
- 2025

⭐ VERY IMPORTANT

3️⃣ Explain Hierarchical Clustering.

📌 Asked in:

- 2020
- 2021
- 2024

⭐ HIGH CHANCE

4️⃣ Differentiate AGNES and DIANA.

📌 Asked in:

- 2022
- 2025

⭐ IMPORTANT

5️⃣ Explain EM Algorithm.

📌 Asked in:

- 2024

⭐ HIGH CHANCE

🎯 MOST EXPECTED QUESTIONS FOR UPCOMING EXAM

⭐ VERY HIGH CHANCE

1. Explain K-Means Clustering.
2. Explain PCA with applications.
3. Explain Hierarchical Clustering.
4. Differentiate AGNES and DIANA.
5. Explain EM Algorithm.

⭐ HIGH CHANCE

6. Explain Gaussian Mixture Model.
7. Explain SOM.
8. Explain K-Mode Clustering.

⭐ MEDIUM CHANCE

9. Explain LLE.
10. Explain Factor Analysis.

⚡ SMART STUDY STRATEGY

🎯 FIRST STUDY THESE

1. K-Means Clustering
2. PCA
3. Hierarchical Clustering
4. AGNES vs DIANA

🎯 THEN STUDY

5. EM Algorithm
6. GMM
7. SOM

🎯 LAST REVISION

8. LLE
9. Factor Analysis
10. K-Mode Clustering

🔥 ONE-NIGHT REVISION PRIORITY

✔ Clustering groups similar data
✔ K-Means uses centroid-based clustering
✔ Hierarchical clustering builds cluster hierarchy
✔ AGNES = Bottom-up approach
✔ DIANA = Top-down approach

✔ PCA reduces dimensions

✔ EM estimates hidden variables

✔ GMM models data using Gaussian distributions

✔ SOM is neural-network based clustering

🎯 TOPPER STRATEGY FOR GOOD CGPA

📌 If You Have Only 3 Hours

Study in this order:

1. K-Means Clustering
2. PCA
3. Hierarchical Clustering
4. AGNES vs DIANA
5. EM Algorithm

These topics alone can cover:

✅ Long questions

✅ PYQ repeated theory

✅ Definitions

✅ Clustering numericals

✅ Advantages & applications

and can help score very high marks in Unit 4.