

Q1. >

ANS.

What do you understand by a cube?

A Data cube (OLAP cube) is a multi-dimensional data structure used to analyze data from multiple perspectives, such as time, product, region, etc.

- Stores data in Dimension and measures.
- Helps in Fast Analytical Queries.

o Structure of a Cube:-

An OLAP cube is made up of:

• Dimension

These are perspective / categories used to analyze data.

• Measure (Facts)

These are numerical values that are analyzed.

• Cells

The intersection of dimension where actual data (measure values) are stored.

o Example:

Sales Data Cube:

o Dimension : 1. Time (Year, Month)
2. Location (City, country)
3. Product.

o Measure : 1. Sales ~~Month~~ Amount.

o Operations of a Cube:-

1. Slice : Select a single Dimension.
2. Dice : Select a sub-cube.
3. Drill-Down : Go from summary to detailed level.
4. Roll-Up : Aggregate Data.

Q2. > Explain About MOLAP.

ANS. MOLAP → Multidimensional Online Analytical Processing.

Definition: MOLAP stores data in a multidimensional cube Format.

Features: 1. Pre-Computed Data (aggregations already computed)

2. stored in specialized storage.

Advantages:-

1. Very Fast Query Performance.
2. Efficient for complex calculations.

Disadvantages:-

1. High Storage Requirement.
2. Limited Scalability.

Example: Pre-calculated Sales cube for quick Reporting.

Q3. > Explain About ROLAP

ANS. ROLAP → Relational Online Analytical Processing.

Definition: ROLAP stores data in relational tables (database)

Features: ① Uses SQL Queries.

② Data is not pre-aggregated data.

Advantages: ① Scalable

② Can handle large Datasets.

DisAdvantages: ① Slower than MOLAP.

② Query Performance depends on Database.

Example: Data stored in Fact and Dimension table.

Q4) What is Hybrid OLAP?

ANS.

• HOLAP combines both MOLAP and ROLAP.

• It stores detailed data in relational database (like ROLAP)

• Aggregate data in Multidimensional cube (like MOLAP)

o How it Works:-

- Frequently used data - stored in MOLAP (fast)

- Detailed Data → stored in ROLAP (large storage)

- Advantages

① Balanced Performance and storage

② Faster Queries than ROLAP.

③ More scalable than MOLAP.

④ Flexible Data Access.

⑤ For Detailed level Queries, it fetches data from relational tables.

- DisAdvantage:-

1. More complex.

2. storage requirement is more.

HOLAP = speed of MOLAP + Scalability of ROLAP.

Q5) Explain Difference between ROLAP and MOLAP.

ANS.

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⇒	NO.	MOLAP:-	NO.	ROLAP:-
	1.	It stands for Multidimensional OLAP.	1.	It stands for Relational OLAP.
	2.	Handles limited Data Volume	2.	Handles Large Data Volume.
	3.	Fast Access	3.	Slower Access.
	4.	Uses Multidimensional Array.	4.	Uses Relational Tables.
	5.	Uses specialized Query Language.	5.	Uses Structured Query Language.
	6.	High storage requirement.	6.	Moderate storage requirement.