DBA

1) Schema definition → gives a particular space to users
2) Storage structure and access method definition
3) Schema and physical organization modification
4) Granting of authorization for data access. → access grant by DBA
5) Routine maintenance. → by DBA

- Periodic backup
- Ensuring available disk space
- Prioritize data

Database system architecture

- Storage manager - we can store huge amt. of data in disk.
- Query processor - to simplify the retrieval and access of data.
  → breaks up query in distinct parts:

  select fieldname
  where condition
  from tablename;

  → generates step by step evaluation known as query plan evaluation.
  → minimum cost query plan is chosen. It is query optimization.
  → feeds to query evaluation engine.

Storage manager

1. Authorization & integrity manager. *defines access*
2. Transaction manager: performs checks if database is in consistent state after a transaction (atomicity property is maintained) eg - withdraw of $50.
3. File manager
4. Buffer manager.

→ Referential integrity constraint - Foreign key   ex - Dept no.

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- Transaction manager   → Eg - Withdraw 1 of $50
  - Performs the checking if database is in consistent state after a transaction (or interruptions in transaction). Atomicity property is maintained.
  - Makes sure database is consistent after concurrent transaction.

- File manager - Converts primitive data to readable format for layman user & vice versa.

- Buffer manager -
  - Transfers data from disk to primary memory
  - Which data to be cached.

Query manager processor
  1. DDL interpreter - Simplifies access to data. selects, from, where. Understands the DDL part of the query (Create, alter, rename)
  2. DML compiler - breaks up the query into different parts and creates evaluation plan. Performs query optimization (chooses lowest cost plan).
  3. Query evaluation engine - It recieves that optimized plan and processes the result of the query