CHANDIGARH UNIVERSITY

Discover. Learn. Empower.

Subject: Technical Training

Subject Code: 25CAP-652

Date: 03/02/2026

Submitted by:

Name: Jatin Tasoria

UID no. 25MCC20054

Branch/Sec. MCA (Cloud)
25MCC(101-A)

Submitted to:-

Faculty Name Prof. Shalabh Bhatiya

Assignment -I

Name :- Jatin Tasoria

UID :- 25MCC20054

Class :- MCA-CCD

Section :- 25MCC-101(A)

Q1) As a DBA in a financial enterprise, compare role-based access control with user-based privilege assignment. Which scales better and why?

Ans) ⇒ User-Based :- The privileges are granted directly to individual users.

Characteristics :

→ Every user has custom privileges

→ Easy to understand for very small teams

Problems :-

→ Does not scale with large no of users

→ Role changes means manually revoking & granting

Eg :- If an employee moves from Analyst to Manager, privileges has to be changed manually.

⇒ Role based :- The privileges are grouped into various roles, and roles are assigned to users

Advantages :-

→ Easy to scale

→ Centralized privilege management

→ Minimal operational risk

⇒ Difference

User based	Role-Based
→ Can manage small no of users	Can manage large no of users
→ Auditing is complex	Auditing is easy.
→ Huge operational efforts	Less operational efforts
→ Have ~~lots~~ compliance risk	No compliance risk

from the above table we can see it clearly that Role-based Access control is better in scale.

Q2 Design a 3-tier architecture for a Wealth Management System. Explain security enforcement at each tier.

Ans) The three layers are as follows:-

→ Client (Presentation)

→ Server (Application)

→ Database

⇒ Client layer:-

It ~~will~~ consists of web portal, Mobile apps and Admin dashboard.

It will allow user-Interaction, input validation and Authentication.

=> Security :-

-> HTTPS
-> Multifactor Authentication (MFA)
-> Secure session handling
-> Client-side input validation
-> No direct Access to database

=> Application layer

It consists of APIs, risk analysis models, transaction orchestration.

It allows to enforce business rules, Authorization decision, data transformation and logging.

=> Security :-

-> Role Based Access control
-> Network segmentation
-> Secure secrets management
-> DDoS protection.
-> API Authentication

=> Data tier

It consists of core banking database, portfolio data, transaction history, Audit logs

It handles persistent storage, data integrity, ACID

=> Security :-

-> Encryption & database Auditing
-> Network isolation.

-> Row-level security
-> Least privilege principle

=>

Presentation layer

Web portal / Mobile App / Admin console

↓

Application layer

APIs / Portfolio engine / Risk engine

↓

Database layer

Portfolio DB / Transaction DB / Audit DB

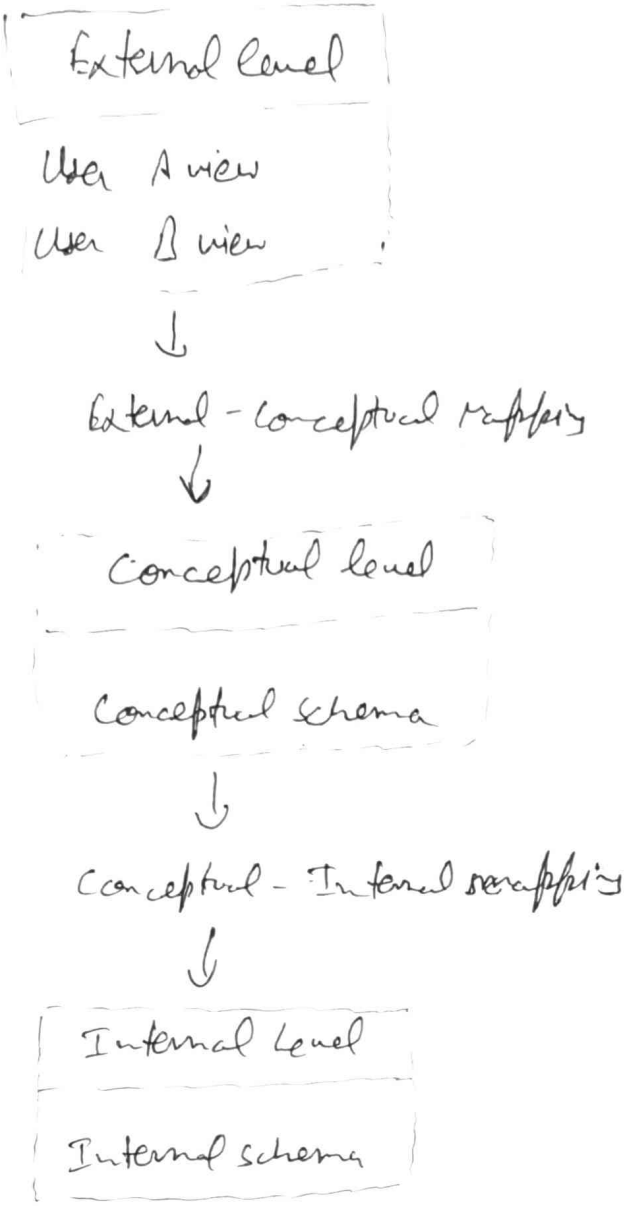
Q.) Explain the ANSI-SPARC three-level architecture with a neat diagram. How does it help in achieving logical and physical data independence.

A.) The ANSI-SPARC model separates a database system into three levels (schema) to isolate users from database implementation details and enable data independence.

These 3 levels are:-

-> External level
-> Conceptual level
-> Internal level

Diagram :



2) Logical Data independence

Ability to change conceptual schema without affecting external schemas.

→ Teller & Auditor views remain unchanged

→ Application continues to work

⇒ Physical Data Independence

Ability to change internal schema without affecting conceptual & external schemas

→ Logical structure unchange

→ No impact on user views or applications