DBMD Sample Question Paper - III

Sample Question Paper 3

END TERM EXAMINATION
SIXTH SEMESTER [B.TECH] JUNE 2024
Paper Code: CIE-316 Subject: Database Modelling & Design
Time: 3 Hours Maximum Marks: 75

Note: Attempt five questions in all including question no.1 which is compulsory. Select one question from each unit.

Q1. Attempt all parts: (3x5=15 Marks)
a) Define metadata. How is it stored and used in a DBMS?
b) What is a superkey? How does it relate to a candidate key?
c) Explain the purpose of the `SELECT` statement in SQL with a basic syntax example.
d) What is an attribute in ER modeling? Describe different types of attributes (simple, composite, derived, multi-valued).
e) How is a 1:1 relationship mapped into relational tables? Discuss different options.

UNIT-I

(Attempt one question from this unit)

Q2.
a) What is data independence? Explain logical and physical data independence with respect to the three-schema architecture. **(8 Marks)**
b) Describe the roles of different users in a database system (e.g., DBA, Database Designer, Application Programmer, End User). **(7 Marks)**

OR

Q3.
a) Explain the concept of relationships in ER modeling. Discuss relationship degrees (unary, binary, ternary) and structural constraints (cardinality, participation). **(8 Marks)**
b) What is categorization (Union Type) in EER modeling? Explain with an example and how it differs from specialization. **(7 Marks)**

UNIT-II

(Attempt one question from this unit)

Q4.
a) Explain the mapping of higher-degree (ternary) relationships to a relational schema with a suitable example. **(8 Marks)**
b) Design an ER diagram for a "Hospital Management System" focusing on Patients, Doctors, Appointments, and Treatments. Map this ER diagram to a logical relational schema. **(7 Marks)**

OR

Q5.
a) Define functional dependency. Explain how functional dependencies are used in the process of normalization, particularly for 2NF and 3NF. **(8 Marks)**
b) Explain Fifth Normal Form (5NF or PJ/NF) and the concept of Join Dependency. **(7 Marks)**

UNIT-III

(Attempt one question from this unit)

Q6.
a) Describe how data integrity constraints (NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK) are specified during table creation in SQL. Provide examples. **(8 Marks)**
b) Explain the difference between static SQL and dynamic SQL in database programming. **(7 Marks)**

OR

Q7.
a) Discuss the advantages and potential disadvantages of using database triggers. When should they be used cautiously? **(8 Marks)**
b) Explain the `INSERT`, `UPDATE`, and `DELETE` DML commands in SQL, including their syntax and how they are used with `WHERE` clauses. **(7 Marks)**

UNIT-IV

(Attempt one question from this unit)

Q8.
a) Explain the concept of a clustered index versus a non-clustered (secondary) index. What are the implications of choosing one over the other? **(8 Marks)**
b) Discuss the objectives of database security (Confidentiality, Integrity, Availability). How can these be compromised? **(7 Marks)**

OR

Q9. Write short notes on any three of the following: (5x3=15 Marks)
a) Covering Indexes

b) SQL `GRANT` and `REVOKE` for privileges

c) Denormalization pitfalls

d) B+-Tree Index Structure (Basic Idea)

e) Query Processing Steps (Overview)****