DBMD Sample Question Paper - I

Sample Question Paper 1

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) Differentiate between a DBMS and a File Processing System.
b) What is a foreign key? Explain its significance with an example.
c) Briefly list and describe the main DML (Data Manipulation Language) commands in SQL.
d) What are the basic components of an ER diagram? Explain each.
e) Convert a simple M:N (Many-to-Many) relationship between two entities A(A1, A2) and B(B1, B2) into relational tables.

UNIT-I

(Attempt one question from this unit)

Q2.
a) Explain the ANSI/SPARC three-schema architecture for database systems. Discuss the concept of data independence in this context. **(8 Marks)**
b) Describe the various phases of the Database Design Life Cycle (DDLC) in detail. **(7 Marks)**

OR

Q3.
a) Discuss various types of data models used in database systems (e.g., Hierarchical, Network, Relational, Object-Oriented). Highlight the advantages and disadvantages of the Relational model. **(8 Marks)**
b) What are common design issues encountered while creating ER/EER models? Explain with examples (e.g., entity vs. attribute, binary vs. higher-degree relationships). **(7 Marks)**

UNIT-II

(Attempt one question from this unit)

Q4.
a) Explain the step-by-step process of mapping ER model constructs (Entities, Relationships of different cardinalities, Attributes) to a relational schema. **(8 Marks)**
b) Design an ER diagram for an "Online Bookstore" system. Consider entities like Book, Author, Customer, Order. Map this ER diagram to a logical relational schema. **(7 Marks)**

OR

Q5.
a) What is normalization? Explain the first three normal forms (1NF, 2NF, 3NF) with suitable examples, highlighting the anomalies they aim to remove. **(8 Marks)**
b) How are multi-valued attributes and M:N recursive relationships mapped to a relational schema? Illustrate with examples. **(7 Marks)**

UNIT-III

(Attempt one question from this unit)

Q6.
a) Explain the `CREATE TABLE` statement in SQL with its various clauses, including defining data types, primary keys, foreign keys, and CHECK constraints. Provide a suitable example. **(8 Marks)**
b) What is a cursor in database programming? Explain its need and the different types of cursors available (e.g., read-only, updatable, scrollable). **(7 Marks)**

OR

Q7.
a) What are database triggers? Explain the ECA model and discuss the difference between row-level and statement-level triggers with examples. **(8 Marks)**
b) Briefly describe different approaches to database programming, such as Embedded SQL and API-based access (like JDBC/ODBC). **(7 Marks)**

UNIT-IV

(Attempt one question from this unit)

Q8.
a) What is indexing in databases? Discuss different types of indexes (e.g., Primary, Clustered, Secondary, B+-Tree, Hash) and their benefits. **(8 Marks)**
b) Explain Discretionary Access Control (DAC) and Mandatory Access Control (MAC) mechanisms for database security. **(7 Marks)**

OR

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

a) Clustering in Databases

b) Denormalization: Purpose and Techniques

c) Boyce-Codd Normal Form (BCNF)

d) Role-Based Access Control (RBAC)

e) Database Tuning goals and areas
