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53 (CS 401) DBMS

2016

DBMS

Paper : CS 401

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer **any five** questions.

1. (a) Draw an Entity-Relationship (ER) diagram for a company database. Assume desired entities, attributes, mapping cardinality and participation constraints for the company database by yourself. 10
- (b) What are the *five* main functions of Database administrator ? 5
- (c) Discuss about two-tier and three-tier architecture of database system. 5

Contd.

2. (a) Define superkey, candidate key, primary key and alternate key. Give suitable example. 10

(b) For the given Relational Database, give a relational algebra expression for each of the following queries.

student (std-id, name, DOB, address)
Books (ISBN-NO, title, Author, publisher)
Borrowed (std-id, ISBN-NO, Date)

(i) Find the name of all students who have borrowed a book published by BPB publication.

(ii) Find the title and author of the book borrowed by "Amit".

(iii) Find the name of student who have borrowed more than five different books published by BPB publisher.

(iv) For each publisher, find the name of students who have borrowed more than five books of that publisher. $2+2+3+3=10$

3. (a) Briefly explain about UPDATE, DELETE and TRUNCATE command of SQL.

5

- (b) Consider the following relations where primary keys are underlined.

Project (proj-no, proj-name, chief-architect) Employee (emp-no, emp-name, address) Assigned (proj-no, emp-no).

Use SQL statement to express the following queries :

- (i) Get details of employees working on project-DRCP1.
- (ii) Get details of project on which employee with name 'John' is working.
- (iii) Count number of projects where chief architect 'Jackie' is involved.

3+3+3=9

- (c) Define two phase, strict two phase and rigorous two phase locking protocol.

6

4. (a) What you mean by functional Dependency ? Discuss with suitable example.

5

- (b) Explain various properties of transaction.

8

- (c) Explain Multiple Granularity with suitable example.

7

5. (a) What is Normalization ? Explain about First and 2nd Normal form with the help of example. 10
- (b) Define Serializability, conflict Serializability and view Serializability Schedule with suitable example. 10
6. (a) Describe deadlock with suitable example and also explain about recovery from deadlock. 8
- (b) Let the given set of functional dependencies be $F: \{B \rightarrow A, D \rightarrow A, AB \rightarrow D\}$. Find the Minimal cover of F . 5
- (c) Discuss about query processing steps. 7
7. (a) Explain about query optimization with suitable example. 7
- (b) Describe the following attributes of E-R model.
- (i) Simple versus composite
- (ii) Single valued versus multivalued. 4
- (c) Define Data Manipulation Language (DML). Explain the different types of DMLS. 5
- (d) Differentiate between Inner join and Outer join. 4