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18CS53

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021 **Database Management System**

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- a. Define the following terms:
 - i) Database
 - ii) DBMS catalog
 - iii) Entity
 - iv) Snapshot
 - v) Degree of a relationship.

(05 Marks)

 Explain types of end-users with suitable examples. List and explain advantages of using DBMS approach.

(05 Marks) (10 Marks

- a. Define the following terms
 - Cardinality
 - ii) Weak entity
 - iii) Program data independence
 - iv) Total participation
 - v) Value sets.

(05 Marks)

- b. Describe three schema architecture. Why do we need mappings between schema levels?
 - (05 Marks)
- c. Explain different types of attributes in ER model with suitable examples for each. (10 Marks

Module-2

- Explain the entity integrity and referential integrity constraints. Why is each considered 3 important. Give examples. (05 Marks)
 - b. Discuss equijoin and natural join with suitable examples using relational algebra notation.

(05 Marks)

- c. Given the schema:
 - Passenger (pid, pname, pgender, pcity)
 - Agency (aid, anme, acity)
 - Flight (fid, fdate, time, src, dest)
 - Booking (pid, aid, fid, fdate)
 - Give relation algebra expression for the following:
 - Get the complete details of all flights to new Delhi
 - ii) Find only the flight numbers for passenger with paid 123 for flights to Chennai before
 - iii) Find the passenger names for those who do not have any bookings in any flights
 - Get the details of flights that are scheduled on both dates 01/12/2020 and 02/12/2020 at
 - Find the details of all male passengers who are associated with jet agency. (10 Marks)

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OR

Explain the ER to relational mapping algorithm with suitable example for each step.

(10 Marks)

Write SQL query for the following database scheme:

Employee(employee_name, street, city)

Works (employee_name, company_name, salary)

Company(company_name, city)

Manages(employee_name, manager_name)

- Find the names, street address, and cities of residence for all employees who work for 'First Bank Corporation' and earn more than \$10,000
- ii) Find the names of all employees in the database who do not work for First Bank Corporation'. Assume that all people work for exactly one company
- iii) Find the names of all employees in the database who earn more that every employee of 'Small Bank Corporation'. Assume that all people work for at most one company
- iv) Find the name of the company that has the smallest payroll
- v) Find the names of all employees in the database who live in the same cities and on the same streets as do their managers. (10 Marks)

Module-3

- Explain cursors and its properties in embedded SQL with suitable example. (05 Marks) How are triggers defined in SQL? Explain with example. (05 Marks) (10 Marks)
 - c. Illustrate insert, delete, update, alter and drop statements in SQL.

- With an example, explain stored procedures In SOL (05 Marks) Briefly explain types of JDBC drives. (05 Marks)
 - Illustrate aggregate functions in SQL

Module-4

- Explain types of update ananalies with examples. (05 Marks)
 - Explain Armstrong inference rules.

(05 Marks)

(10 Marks)

c. What is the need for normalization? Explain 1NF, 2NF and 3NF with examples. (10 Marks

OR

- a. What is functional dependency? Write an algorithm to find minimal cover for set of functional dependencies. Construct minimal cover m for set of functional dependencies $E: \{B \rightarrow A, D \rightarrow A, AB \rightarrow D\}$ which are : (10 Marks)
 - b. Consider the schema R = ABCD, subjected to FDs $F = \{A \rightarrow B, B \rightarrow C\}$, and the nonbinary partition D1 = {ACD, AB, BC}. State whether D1 is a lossless decomposition? [give all steps in detail]. (10 Marks)

Module-5

a. Define transaction. Discuss ACID properties.

(05 Marks)

b. With a neat diagram explain transition diagram of a transaction.

(05 Marks)

Why concurrency control and recovery are needed in DBMS? Explain types of problems that may occur when two simple transactions run concurrently. (10 Marks)

OR

- When deadlock and starvation problem occur? Explain how these problems can be resolved. (10 Marks)
 - b. Briefly discuss the two-phase locking techniques for concurrency control.

(10 Marks)

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