

## CBCS SCHEME

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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

- 1 a. Define the following terms :
  - i) Database
  - ii) DBMS catalog
  - iii) Entity
  - iv) Snapshot
  - v) Degree of a relationship. (05 Marks)
- b. Explain types of end-users with suitable examples. (05 Marks)
- c. List and explain advantages of using DBMS approach. (10 Marks)

OR

- 2 a. Define the following terms
  - i) 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

- 3 a. Explain the entity integrity and referential integrity constraints. Why is each considered 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, aname, acity)  
 Flight (fid, fdate, time, src, dest)  
 Booking (pid, aid, fid, fdate)

Give relation algebra expression for the following :

  - i) 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 06/11/2020
  - iii) Find the passenger names for those who do not have any bookings in any flights
  - iv) Get the details of flights that are scheduled on both dates 01/12/2020 and 02/12/2020 at 16:00 hours
  - v) Find the details of all male passengers who are associated with jet agency. (10 Marks)

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OR

- 4 a. Explain the ER to relational mapping algorithm with suitable example for each step. (10 Marks)
- b. 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
  - 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
  - Find the names of all employees in the database who earn more than every employee of 'Small Bank Corporation'. Assume that all people work for at most one company
  - Find the name of the company that has the smallest payroll
  - 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

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

OR

- 6 a. With an example, explain stored procedures in SQL. (05 Marks)
- b. Briefly explain types of JDBC drivers. (05 Marks)
- c. Illustrate aggregate functions in SQL. (10 Marks)

Module-4

- 7 a. Explain types of update anomalies with examples. (05 Marks)
- b. Explain Armstrong inference rules. (05 Marks)
- c. What is the need for normalization? Explain 1NF, 2NF and 3NF with examples. (10 Marks)

OR

- 8 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 which are :  $E : \{B \rightarrow A, D \rightarrow A, AB \rightarrow D\}$  (10 Marks)
- b. Consider the schema  $R = ABCD$ , subjected to FDs  $F = \{A \rightarrow B, B \rightarrow C\}$ , and the non-binary partition  $D1 = \{ACD, AB, BC\}$ . State whether D1 is a lossless decomposition? [give all steps in detail]. (10 Marks)

Module-5

- 9 a. Define transaction. Discuss ACID properties. (05 Marks)
- b. With a neat diagram explain transition diagram of a transaction. (05 Marks)
- c. 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

- 10 a. 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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