CBCS SCHEME

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21CS53

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Database Management Systems

Time: 3 hrs. Max. Marks: 100

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Explain in detail the characteristics of database approach. **(08 Marks)**

b. Define the following terms and also give example :
i) Database ii) DBMS **(04 Marks)**

c. List and explain the advantages of using DBMS Approach. **(08 Marks)**

OR

2 a. Explain cardinality ratio and participation constraints along with an example. **(06 Marks)**

b. With a neat diagram explain the three schema architecture. **(06 Marks)**

c. Draw an ER diagram for library database by considering at least 5 entities. **(08 Marks)**

Module-2

3 a. Explain in detail characteristics of Relations. **(06 Marks)**

b. Discuss different types of update operations on relational database. Also give an example. **(06 Marks)**

c. Write a note on Natural join and division operation. **(08 Marks)**

OR

4 a. Consider the 2 tables. Show the result of the following :

R_1

a_1	a_2	a_3
20	L	15
15	m	18
25	L	16

R_2

b_1	b_2	b_3
20	L	6
25	n	8
28	1	4

(i) $R_1 \bowtie_{(R_1.a_1 = R_2.b_1)} R_2$

(ii) R_1 ⟕ $_{(R_1.a_1 = R_2.b_1)}$ R_2

(iii) R_1 ⟖ $_{(R_1.a_1 = R_2.b_1)}$ R_2

(iv) R_1 ⟗ $_{(R_1.a_1 = R_2.b_1)}$ R_2

(08 Marks)

b. With an example explain steps of ER to Relational Mapping algorithm. **(12 Marks)**

Module-3

5 a. For the following Database schema.
Employee (Fname, Minit, Lname, SSN, Bdate, Address, Salary, SuperSSN, DNo)
Department(DName, Dno, Mgr_SSN, Mgr_Startdate)
Dept_Locations(Dno, Dlocation)
Project(PName, Prj_no, Plocation, Dnum)
Works_on(ESSN, Prj_no, Hours)
Dependent(ESSN, DependentName, Sex, Bdate, Relationship)
Write SQL Queries for the following :
(i) Find sum_of_salaries of all employees who work in Dept No 10, average salaries of all employees who work in Dept No 10.
(ii) List all employees who do not have any dependent.
(iii) For each project, retrieve the project number and the number of employees who work on that project.
(iv) Make list of all project numbers for projects that involve an employee whose last name is 'Kumar'. **(08 Marks)**

b. Write command that is used for table creation. Explain how primary key, foreign key are specified in SQL during table creation with suitable example. **(06 Marks)**

c. Explain view in SQL, with suitable example. **(06 Marks)**

OR

6 a. Explain stored procedures in SQL with example. **(06 Marks)**

b. How triggers are defined in SQL? Explain with an example. **(06 Marks)**

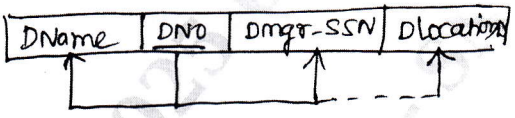
c. Write a note on : (i) Cursor (ii) Assertions **(08 Marks)**

Module-4

7 a. List and explain the informal Design guidelines for relation schemas. **(08 Marks)**

b. Define the following :
(i) Functional dependency (ii) Key (iii) Superkey (iv) Prime attribute **(06 Marks)**

c. For the given schema, discuss the 3 main techniques to achieve first normal form.



(06 Marks)

OR

8 a. Explain in detail 2nd Normal form and 3rd Normal form along with example. **(08 Marks)**

b. Write an algorithm for determining X^+, the closure of X under F. Give an example. **(06 Marks)**

c. Write a note on 4th Normal form. **(06 Marks)**

Module-5

9 a. Define Transaction. Discuss ACID properties. **(06 Marks)**

b. With neat diagram explain transition diagram of a transaction. **(06 Marks)**

c. Explain the Lost Update problem and Temporary update problem with respect to concurrent transaction execution. **(08 Marks)**

OR

10 a. Briefly discuss 2-phase locking techniques for concurrency control. **(10 Marks)**

b. Write a note on :
i) Deadlock prevention protocols ii) Basic Timestamp ordering algorithm **(10 Marks)**

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