



JE – 325

V Semester B.Tech. (CSE/ISE) Degree Examination, February 2021
(CBCS Scheme)

18CIPC 503 : DATABASE MANAGEMENT SYSTEMS

Time : 3 Hours

Max. Marks : 100

Instructions : 1) Question - 1 is **compulsory**.

2) Question - 4, 5 are **compulsory**.

3) Answer Q.-2 or Q.-3, Q.-6 or Q.-7, Q.-8 or Q.-9.

1. 1) Define DBMS.

(15×1=15)

2) Define Canned transaction.

3) Define Weak entity type.

4) Define Schema and Scheme Evolution.

5) Define record-based data models.

6) What is purpose of SQL ?

7) What is intention locks ?

8) What is bitmap indexing ?

9) What is Union compatibility ?

10) What is the difference between DELETE and TRUNCATE commands ?

11) What are triggers ?

12) What is multiple granularity locking ?

13) What is the difference between ORDERBY and GROUPBY ?

14) What is a grid file ?

15) In tuple relational calculus $P1 \rightarrow P2$ is equivalent to :

a) $\neg P1 \vee P2$

b) $P1 \wedge P2$

c) $P1 \vee P2$

d) $P1 \wedge \neg P2$

P.T.O.



2. a) Compare DBMS v/s File system. 05
 b) Explain different types of attribute with examples. 05
 c) Discuss ER-Relational Mapping procedure. 07

OR

3. a) Discuss a high-level data model in the database design process. 06
 b) What are relationship types and recursive relationship types? Explain the differences among a relationship instance, a relationship type, and a relationship set. 06
 c) Discuss cardinality and participation concept in relationship type. 05
 4. a) What are the various restrictions on data that can be specified on a relational database schema in the form of constraints? Explain. 07

b) R :

A	B
1	2
1	3
4	8
8	5
8	1

S :

B	C	D
5	6	1
8	8	5
2	8	6

Compute :

1. $\pi_{C,D}(S)$.
 2. $R \times S$.
 3. $R \bowtie S$.
 4. $R \cup S$
 5. $\pi_{B,C}(R \bowtie S)$.
 6. $R \bowtie_{R.A < S.C} S$.
 7. $\pi_B(R) \cap \pi_B(S)$.
 8. $\pi_B(R) - \pi_B(S)$.
 9. $R * S$
 10. $R + S$

5. a) Discuss DDL operations of SQL, with suitable example for each. 7
 b) Consider the following schema of a company database : 10

Employees(eid : int, ename : string, DOB : int, address : string, super_eid : int)

Departments(did:integer, dname: string)

Projects(pid:integer, pname : string, did: integer)

Works_on(eid:integer, pid: integer, hours: integer)



For the above company database, write SQL statements for :

- i) Get the details of the eldest employee working on project = "IoT;"
- ii) Get the details of employee who resides in "KR Circle"
- iii) Get the details of employee who are born in "1982"
- iv) Get supervisor's details of each department.

6. a) Consider the following relation : CAR_SALE(Car#, Date_sold, Salesperson#, Commission%, Discount_amt), 10

Assume that a car may be sold by multiple salespeople, and hence {Car#, Salesperson#} is the primary key.

Additional dependencies are:

Date_sold → Discount_amt and Salesperson# → Commission%

- i) Define 1NF, 2NF, 3NF.
 - ii) Based on the given primary key, is this relation in 1NF, 2NF or 3NF. Why or why not ?
 - iii) How would you successively normalize it completely ?
- b) Define Boyce-Codd normal form. How does it differ from 3NF ? Why is it considered a stronger form of 3NF ? 7

OR

7. a) State the informal guidelines for relation schema design. Illustrate how violation of these guidelines may be harmful. 5
- b) Explain join dependency and fifth normal form. 6
- c) What is multivalued dependency ? Explain 4NF. 6
8. a) Explain different concurrency control techniques and its variants. 7
- b) Differentiate between Internal hashing and external hashing techniques. 10

OR

9. a) Explain multilevel indexes and index on multiple keys. 7
- b) Discuss RAID technology. 10
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