

S.No. : 24

BBM 2602

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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 27333

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BBA Examination 2021-22

(Even Semester)

DATABASE MANAGEMENT SYSTEM

Time : Three Hours]

[Maximum Marks : 60

Note :- Attempt all questions.

SECTION-A

1. Attempt all parts of the following : $8 \times 1 = 8$

- What do you understand by logical data independence?
- What is a join in DBMS?
- What is weak entity set and how it is represented in E-R diagram?
- Explain integrity constraints with the help of suitable example.

[P. T. O.]

- (e) Define functional dependency.
- (f) Explain the execution sequence of basic SQL query.
- (g) Define the UNION clause with the help of example.
- (h) Differentiate between static and dynamic SQL.

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$

- (a) Describe each of the following components of a DBMS :
 - (i) Data dictionary
 - (ii) Data security and integrity
 - (iii) Concurrent data access for multiple users
 - (iv) Data query manipulation and reporting
- (b) Construct an ER diagram for the following :

A university registrar's office maintains data about the following entities :

 - (i) Courses, including number title, credits, syllabus and prerequisites.

- (ii) Course offering including course number, year, semester, section number, instructor(s), timings and classroom.
- (iii) Students, including student-id, name and program.
- (iv) Instructors, including identification number, name, department and title.

Further, their enrolment of student in courses and grades awarded to students in each course they are enrolled for, must be appropriately modelled. Construct an ER diagram for registrar's office.

- (c) Decompose the relation $R = (A, B, C, D, E)$ with the set of functional dependencies $A \rightarrow BC, CD \rightarrow E, B \rightarrow D$ into 3NF relation.
- (d) Write SQL queries for the given database :

Employee (eid, ename, street, city)

Works (id, cid, salary)

Company (cid, cname, city)

- (i) Modify the database so that Jack now lives in 'Mumbai'.

[P. T. O.]

- (ii) Find all employees of 'ANZ corporation'.
- (iii) Find all employee id who live in same cities as the company for which they work.
- (iv) Find the highest paid employee.

SECTION – C

Note :- Attempt all questions from this section.

10×4=40

3. Attempt any two parts of the following :
- (a) What are the major issues in implementing a DBMS?
 - (b) Explain three tier architecture of DBMS.
 - (c) Discuss the various disadvantages in the file system and explain how it can be overcome by the database system.
4. Attempt any two parts of the following :
- (a) Differentiate between following :
 - (i) Weak entity and strong entity
 - (ii) ER diagram and flowchart

- (b) Draw ER diagram for the following "A teacher can teach many courses. A student can enrol in many courses. A course may be a part of one or many programmes. A teacher can be mentor of many students; however, a student can have only one mentor."
- (c) Define the concept of aggregation. Give two examples of where this concept is useful.

5. Attempt any two parts of the following :

- (a) What is normalization? Normalize following relation up to 3NF :

Bank (acno, cust_name, ac_type, bal, int_rate, cust_city, branchId, branch_nm, br_city).

- (b) What is decomposition? Why is it required? Explain the difference between lossy decomposition and non-loss decomposition with example.
- (c) Consider the relation scheme $R = \{E, F, G, H, I, J, K, L, M, M\}$ and the set of functional dependencies $\{\{E, F\} \rightarrow \{G\}, \{F\} \rightarrow \{I, J\}, \{E, H\} \rightarrow \{K, L\}, K \rightarrow \{M\}, L \rightarrow \{N\}\}$ on R. What is the key for R?

[P. T. O.]

6. Attempt any two parts of the following :

- (a) Write a SQL query for inserting even numbers in EVEN table and odd number in ODD table from number 1 to 50.
- (b) Consider the following relations for a database that keeps track of business trips of salespersons in a sales office :

SALES PERSON (SSN, Name, Start-Year, Dept-No.)

TRIP (SSN, From-City, To-City, DepartureDate, Return-Date, Trip-ID)

EXPENSE (Trip-ID, Account #, Amount)

Specify the following queries in SQL :

- (i) Find the details (all attributes of TRIP relation) for trips whose expenses exceeds \$2000.
 - (ii) Find the SSN of salesman who took trips to 'Honolulu'.
- (c) Explain the GROUPBY clause. What is the difference between the WHERE and HAVING clause in SQL?