

**M.Sc. (INFORMATICS) / III Semester 2018
PAPER IT-32-Database Management Systems**

TIME:03 hours**Max Marks: 75***(Write your Roll No. on the top immediately on receipt of this question paper)**(Answer all parts of a Question together)**(Answer any 5 Questions)***Q1**

- a) Distinguish between the responsibilities of the DBA and the Database Designers? 3
- b) What are Materialized Views? Explain with Suitable example. 4
- c) Explain Project Join Natural Form(PJNF) with an example 4
- d) What are commonly accepted goals of Database Security? Which security mechanisms which can be adopted to achieve these goals? 4

Q2 a) Construct an E-R diagram for a BANK database with following details

- i. It will maintain information about all Branches like Branch Name, City, Branch Manager, Contact nos, Branch Address
- ii. It will maintain information of all Departments in each branch like Department Name, Contact Number, Head of Department
- iii. It will maintain information about Employees like Name, Address, Designation, Contact no, salary, department and branch she works for
- iv. It will maintain information about all Customers like Name, Address, Contact No
- v. It will maintain information about Loans taken by customer from bank like Loan type, Date, Amount, Duration, Installment_amt
- vi. It will maintain information about all Accounts opened by the customers like Account_type, Balance Available, Opening date
- vii. It will maintain information about all Transactions that are being taken place for each account like Transaction Type, Amount, Date

Specify entities, relationship, constraints, assumptions clearly . You can add more attributes if required 11

- b) Map the ER components above to corresponding Relational Components explaining the steps. 4

Q3 a) Distinguish between **Key**, **Candidate Key** and **SuperKey** with examples 3

- b) Consider the following relational database schema

SUPPLIERS(SupplierNo, SupplierName, Status, City)**PARTS**(PartNo, PartName, Color, Weight, City)**PROJECTS**(ProjNo, ProjName, City)**SHIPMENTS**(SupplierNo, PartNo, ProjectNo, Qty)

Write Relational Algebra expressions for the following?

[2*6]

- i. Get details of parts supplied by a supplier in "Chennai"
- ii. Get project numbers for projects using at least one part available from supplier S2.
- iii. Get the part numbers for parts supplied to any project by a supplier in the same city as the project.
- iv. Get total qty of part P1 supplied by Supplier S1 to each project
- v. Get all cities in which at least one supplier, part and project is located
- vi. Get project numbers for projects supplied with at least all parts available from supplier S3.

Q4)

- a) Consider the following relational database schema

Employee(Ssn, Name, Bdate, Address, Sex, Salary, Super_Ssn, Dno)
Department(Dnumber, Dname, Manager_Ssn)
Project(Pnumber, Pname, Control_Dnum)
Works_On(ESsn, Pnumber, Hours_Per_Week)

Write an Embedded-SQL program using C/C++ to List the Employees who are not working on any project. Define appropriate cursors and operations

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- b) What is a Recursive Closure in relational algebra? Explain with an example.
c) Discuss the naming conventions used for various constructs in ER diagram

Q5) Consider the following relational database schema

Branch(branch_id, branch_name, contact_no, manager_id)
Employee(emp_id, branch_id, emp_name, contact_no, address, salary)
Customer(cust_id, cust_name, contact_no, address)
Clothes(cloth_id, branch_id, des_id, cust_id, cloth_type, color, size, price, mfg_date, sold_date, emp_id)
Designer(des_id, des_name, contact_no, address)
Complain(comp_id, cloth_id, branch_id, cust_id, description, comp_date, res_date, res_desc status, emp_id)

[2*5]

- a) Write SQL queries for the following
- List the clothes in "Kirti Nagar" branch that have not been sold
 - Find the designers whose designed clothes are maximum in the store.
 - Find the list of all customers who have bought clothes from "Greater Kailash" branch more than one year after they have been manufactured
 - Find names of all the Customers who have not bought any cloth in last 6 months
 - List the customer name contact no of all customers whose complaints are still open
- b) Write SQL to give update permission on res_des and status to employee "Ashok" 2
c) Branch_id (5) is getting merged with Branch_id(7). Write SQL statements to make changes in above relational schema 3

Q6

- a) Normalize the following DB step by step and show dependencies and results after 1NF, 2NF, 3NF, BCNF

Grade_report(Student_No, Student_Name, (Major, Adviser, (Course_No, Course_title, Credits, Instructor_Name, Instructor_Location, Grade)))

- b) Explain Triggers in SQL with an example?
c) Explain difference between Total Participation and Partial Participation with an example

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