DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF MANAGEMENT AND INFORMATION SCIENCES
FIRST SESSIONAL
SUBJECT: (MCA-102) DATABASE MANAGEMENT SYSTEMS

Examination	: M.C.A. Semester I	Seat No.	:
Date	: 4/10/2022	Day	: Tuesday
Time	: 11:45 to 1:00 PM	Max. Marks	: 36

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 **Do as directed.** **[12]**

CO2 N (a) Illustrate purpose of generalization in E-R Diagram. [1]

CO2 N (b) Differentiate : Super key, Primary key and Candidate Key [2]

(c) Determine relational algebra operation for following relational schema. [3]
Student(stud-id,name,age) Couse(course_id,course_nm,joindate)
CO2 E Stud_course(stud-id,course_id).
(i) find the names of students who join MCA course
(ii) find the names of students whose age is greater than 22

(d) Database integrity means _____ [1]
(a) Whole transaction must be complete or it should be not happened at all at the end.
CO1 U (b) Multiple user can update the data at the same time.
(c) It maintains the data according to constraint.
(d) None of above

(e) **Sales** [2]

CUS_ID	Name	Ord_NO	Ord_Date	Prod_ID	Description	Qty_Ord
C001	Gold	O81	15-Apr	P005	Chisel	6
C001	Gold	O81	15-Apr	P004	Plane	14
C075	Red	O99	16-Apr	P015	Saw	3
C009	Blue	O56	16-Apr	P033	Punch	24
C009	Blue	O56	16-Apr	P004	Plane	9
C001	Gold	O88	17-Apr	P015	Saw	10

CO3 N Identify the dependencies from given table data.

(f)

Unitcode	Unit name	Coursecode	Coursename
UG453	Introduction to database	COMP2009	Computing
UG452	Networking	COMP2009	Computing
UG458	Basic of OS	COMP2009	Computing
UG869	Project	BUSS3015	Management

CO2 N Consider Unicode is a primary key in the given table. Analyze the data and find out is there any transitive dependency present in given table or not. If present then identify it.

CO2 N (g) For given table person(name,age,city) . Construct a sql query which givens the details about person who are living in baroda,delhi or mumbai. [1]

Q.2 Attempt ***Any Three*** from the following questions. **[12]**

CO1 U (a) Discuss any four advantages of database system over the file system in detail. [4]

CO1 U (b) Describe the different levels of abstractions of DBMS. [4]

CO1 U (c) What is transaction? Explain atomicity and durability is maintained in transaction management system. [4]

CO1 U (d) Discuss various users of the DBMS in detail. [4]

Q.3 **Attempt from the following** **[12]**

CO2 **N** (a) Analyze the entity, attributes and cardinalities for the following requirements and Draw Entity Relationship Diagram. **[6]**

Each department has a unique name, a unique number, and a particular employee who manages the department. We keep track of the start date when that employee began managing the department. A department may have several locations. A department controls a number of projects, each of which has a unique name, a unique number, and a single location. We store each employee's name (first, last, MI), Social Security number (SSN), street address, salary, sex (gender), and birth date. An employee is assigned to one department, but may work on several projects, which are not necessarily controlled by the same department. We keep track of the current number of hours per week that an employee works on each project. We also keep track of the direct supervisor of each employee (who is another employee).

CO2 **E** (b) (i) Explain purpose of Rename operation with example. **[3]**

(ii) Illustrate and compare Natural Join with Cartesian product in detail. **[3]**

OR

CO2 **N** (a) Draw and demonstrate usage of derived, composite, primary key attribute, specialization/generalization, total participation for following Banking requirements in E-R Diagram. **[6]**

The bank is organized into branches. Each branch is located in a particular city and is identified by a unique name. The bank monitors the assets of each branch.

Bank customers are identified by their customer-id values. The bank stores each customer's name, and the street and city where the customer lives. Customers may have accounts and can take out loans. A customer may be associated with a particular banker, who may act as a loan officer or personal banker for that customer. Bank employees are identified by their employee-id values. The bank administration stores the name and telephone number of each employee, the names of the employee's dependents, and the employee-id number of the employee's manager. The bank also keeps track of the employee's start date and, thus, length of employment. The bank offers two types of accounts – savings and checking accounts. Accounts can be held by more than one customer, and a customer can have more than one account.

CO2 **E** (b) (i) Identify and write relational algebra operation for following Queries for relation schema. customer (customer- name ,customer-street, customer-city),account (account-number, branch-name, balance),loan (loan-number, branch-name, amount),depositor (customer-name, account-number),borrower (customer-name, loan-number) **[3]**

- Find all customer names whose account balance greater than 500 $\Pi_{customer\text{-}name}(\sigma_{balance>500}(Current\ account \bowtie depositor))$
- Find all customer names whose loan at down town branch
- List all customer names who have loan and account both

(ii) Explain in detail Union, Set Difference and Selection Operation. **[3]**

2) $\Pi_{customername}(\sigma_{branch\text{-}name="downtown"}(loan \bowtie borrower))$ — who borrow loan.

or 3) $\Pi_{customername}(borrower) \cap \Pi_{customername}(depositor)$

or $\Pi_{customername}(borrower \bowtie depositor)$