

Roll No. _____ Name _____ Section _____

National University of Computer and Emerging Sciences, Lahore Campus



Course: Database Systems
Program: BS(CS, DS, SE)
Duration: 60 Minutes
Paper Date: 28-Feb-23
Section: ALL
Exam: Midterm-I

Course Code: CS2005
Semester: Spring 2023
Total Marks: 25
Weight: 15%
Page(s): 2

Instruction/Notes: Solve the questions in the given order.

You will not get any credit if you do not show proper working, reasoning, and steps as asked in the question statements.

Consider the following database for an Online fruit and vegetable shop FreshFruVeg . A customer can order fruits and vegetables, and the shop delivers the required items on the same day.

The attribute CID is a foreign key in the ORDER table, and attributes OID and IID are foreign keys in the ORDERdetail table. The attribute AmountKg indicates the amount in kilograms ordered by the Customer. The price of the items (fruit/vegetable) are not fixed and may differ daily depending on the economic changes.

ORDERdetail

OID	IID	AmountKg	PricePerKg
1	1	1	100
1	3	2	95
3	5	2.5	50
2	1	6	95
1	5	1	80
1	4	2	200
2	4	1.5	55
4	8	2	75

ORDER

OID	CID	date
1	4	12-jan-2023
2	4	28-dec-2022
3	5	10-jan-2023
4	2	12-jan-2023

CUSTOMER

CID	Name	Age	Gender
1	Tahreem	25	F
2	Izaan	50	M
3	Isbah	42	F
4	Ismail	25	M
5	Alia	18	F
6	Khadija	25	F

ITEMS

IID	IName	Type
1	Apple	Fruit
8	Orange	Fruit
3	Bringle	Vegetable
5	Ocra	Vegetable
6	Potato	Vegetable
4	Strawberry	Fruit

Q1. (5 points) Write the result of the following queries for the database state given above and **explain in one sentence what these queries are doing.**

a. Select OID from Order join Customer on Order. CID = Customer.CID where Gender = 'M'

Except (Select O.OID from Orderdetails as O join Item as I on O.IID = I.IID where I.Type = 'fruit' **Intersect** Select O.OID from Orderdetails as O join Item as I on O.IID = I.IID where I.Type = 'vegetable')

<table><tr><td><u>OID</u></td></tr><tr><td>1</td></tr><tr><td>2</td></tr><tr><td>4</td></tr></table> <p>Male Customers Orders</p>	<u>OID</u>	1	2	4	Except	<table><tr><td><u>OID</u></td></tr><tr><td>1</td></tr><tr><td>2</td></tr><tr><td>1</td></tr><tr><td>2</td></tr><tr><td>4</td></tr></table> <p>Orders that include purchased fruits</p>	<u>OID</u>	1	2	1	2	4	Intersect	<table><tr><td><u>OID</u></td></tr><tr><td>1</td></tr><tr><td>3</td></tr><tr><td>1</td></tr></table> <p>Orders that don't include fruits</p>	<u>OID</u>	1	3	1
<u>OID</u>																		
1																		
2																		
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<u>OID</u>											
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<u>OID</u>											
1											
<u>OID</u>											
2											
4											

- b. Select O.OID, O.CID
 From Order O join Orderdetail OD on O.OID=OD.OID
 Groupby O.OID, O.CID
 Having sum(OD.AmountKg * OD.PricePerKg) > 300

Join and group on OID

<u>OID</u>	<u>IID</u>	AmountKg	PricePerKg	CID	Sum
1	1	1	100	4	>300
1	3	2	95	4	
1	5	1	80	4	
1	4	2	200	4	
2	4	1.5	55	4	> 300
2	1	6	95	4	
3	5	2.5	50	5	<300
4	8	2	75	4	<300

Answer

<u>OID</u>	<u>CID</u>
1	4
2	4

Print the number of the Order along with customerID such that the total order amount is greater than 300

Q2. (15 points) Specify the following queries in **SQL**

- a. Print the CID of the teenage customers who have placed an order before 1-Jan-2023.

```
SELECT cid
FROM customer c JOIN order o ON c.cid=o.cid
WHERE c.age<=19 AND o.date<1-Jan-2023;
```

- b. Retrieve the name of Items that are **not** ordered by any customer.

```
SELECT iname
FROM items i LEFT JOIN orderdetail od ON i.iid=od.iid
WHERE od.iid IS NULL;
```

- c. Print the CID of the Customers who have placed more than three orders **in a day**.

```
SELECT DISTINCT cid
FROM order
GROUP BY date, cid
HAVING COUNT(*)>3;
```

PTO for Question 3

Q3. (5 points) Apply the following operations on the above database. **State clearly if the operation would be carried out successfully or not.**

Explain your answer briefly. In case of a successful operation, indicate the changes that will be made to the above database (i.e., clearly point out which rows are updated/deleted). In case of failure, explain why it failed.

Please note that all operations are independent.

Assume the referential integrity constraint on foreign keys (ORDERdetail.OID, ORDERdetail.IID, ORDER.CID) is ON DELETE/UPDATE CASCADE.

- a) INSERT INTO Order VALUES (6, 8, 12-Jan-2023) **(Failed, foreign key issue)**
- b) DELETE FROM Order WHERE OID= 2 **(Successful, 3 rows deleted(1 from Order,2 from Orderdetail))**
- c) DELETE FROM Customer WHERE Age=25 **(Successful, 11 rows deleted(3 from Customer,2 from Order, 6 from Orderdetail))**
- d) UPDATE OrderDetail SET PricePerKg = 100 Where IID >4 **(Successful, 3 rows updated)**
- e) UPDATE OrderDetail SET IID = 4 Where IID = 5 **(Successful, 2 rows updated)**