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| **National University of Computer and Emerging Sciences, Lahore Campus** | | | | |
| C:\Users\saif\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\final design.jpg | **Course:** | **Database Systems** | **Course Code:** | **CS2005** |
| **Program:** | **BS(CS, DS, SE)** | **Semester:** | **Spring 2023** |
| **Duration:** | **60 Minutes** | **Total Marks:** | **25** |
| **Paper Date:** | **28-Feb-23** | **Weight** | **15%** |
| **Section:** | **ALL** | **Page(s):** | **2** |
| **Exam:** | **Midterm-I** |  |  |
| **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. | | | |

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| 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.**

1. 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’)

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| |  | | --- | | OID | | 1 | | 2 | | 4 |   Male Customers Orders | Except | |  | | --- | | *OID* | | 1 | | 2 | | 1 | | 2 | | 4 |   Orders that include purchased fruits | Intersect | |  | | --- | | *OID* | | 1 | | 3 | | 1 |   Orders that don’t include fruits |

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| |  | | --- | | OID | | 1 | | 2 | | 4 |   Male Customers Orders | **Except**   |  | | --- | | *OID* | | 1 | |  | | **Answer**   |  | | --- | | **OID** | |  | | **2** | | **4** | | **Answer**  The queries print the order ID of the male customers, where the order include either fruits or vegetable (not both). |

1. 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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *OID* | *IID* | 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**

|  |  |
| --- | --- |
| ***OID*** | ***CID*** |
| **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***

1. 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;

1. 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;

1. 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 **(Failed due to PK constraints)**