National University of Computer and Emerging Sciences, Lahore Campus

	Course:	Database Systems	Course Code:	CS203
	Program:	BS(Computer Science)	Semester:	Spring 2018
	Duration:	60 Minutes	Total Marks:	35
	Paper Date:	26-Feb-18	Weight	15%
	Section:	ALL	Page(s):	5
	Exam:	Midterm-I		

Instruction/Notes: Scratch sheet can be used for rough work however, all the questions and steps are to be shown on question paper. ***No extra/rough sheets should be submitted with question paper***.
You will not get any credit if you do not show proper working, reasoning and steps as asked in question statements.

Consider the following State and Schema of a Retailer Store database. It keeps track of the orders placed by the customers.

CUSTOMER

cid	cname	city
100	Ismail	Karachi
200	Isbah	Lahore
300	Tahreem	Islamabad
600	Izaan	Lahore
700	Khadija	Karachi
800	Alia	Lahore

ORDER

oid	odate	cid
1	2018-01-20	200
3	2018-01-20	600
5	2018-02-15	300
7	2018-02-20	800

PRODUCT

pid	pname	price	company
10	Nutella	250	Ferrero
20	Kinder Joy	60	Ferrero
40	Milo	30	Nestle
50	Maggi Noodle	25	Nestle
70	Donuts	50	Dunkin Brands
80	Horlicks	400	GSK

ORDER_DETAIL

oid	pid	quantity	discountPercent
1	10	2	15
1	70	6	25
3	10	1	15
5	10	3	15
5	40	4	15
5	50	5	25
7	10	2	15

```
CREATE TABLE
customer (
     cid INT NOT NULL,
     cname VARCHAR(30),
     city VARCHAR(30),
     PRIMARY KEY (cid)

);
```

```
CREATE TABLE product (
     pid INT NOT NULL,
     pname VARCHAR(30)
UNIQUE,
     price DECIMAL(9,2),
     company VARCHAR(30),
     PRIMARY KEY (pid)

);
```

```
CREATE TABLE order (

     oid INT NOT NULL,

     odate DATE,
     cid INT,
```

```
CREATE TABLE order_detail (
     oid INT NOT NULL,
     pid INT NOT NULL,
     quantity INT,
     discountPercent INT,
```

| PRIMARY KEY (oid),
FOREIGN KEY (cid) REFERENCES customer(cid) ON DELETE SET NULL ON UPDATE CASCADE

); | PRIMARY KEY (oid, pid),
CHECK (quantity>0),
FOREIGN KEY (oid) REFERENCES order(oid) ON DEL CASCADE ON UPDATE CASCADE,
FOREIGN KEY (pid) REFERENCES product(pid) ON D CASCADE ON UPDATE CASCADE

); |

Q1. *(10 points)* Apply following operations on the above database. State if the operation would be carried out successfully or not. **Explain your answer briefly.** In case of successful operation indicate the changes that will be made to the above database and in case of Reject state the error that occurred. Please note that all operations are independent.

a) INSERT INTO ORDER_DETAIL (oid, pid, quantity, discountPercent) VALUES (1, 70, 10,15);

Accept O

Reject O

b) UPDATE ORDER_DETAIL SET discountPercent = '20';

Accept O
Reject O

c) UPDATE ORDER SET oid = 4 WHERE oid=5;

Accept O
Reject O

d) DELETE FROM customer WHERE cname = 'Izaan';

Accept O
Reject O

e) DELETE FROM order;

Accept O
Reject O

Roll No. _____Name _____ Section ___

Q2. *(10 points)* Write the result of the following queries for the Database State given above and explain in one sentence what these queries are doing.

ONLY FOR SECTION (A, B, C, D)

a. City $\mathcal{F}_{COUNT(*)}$ ((CUSTOMER $\bowtie_{CUSTOMER.cid=ORDER.cid}$ ORDER) $\bowtie_{ORDER.oid= ORDER\_DETAIL.oid}$ ORDER_DETAIL)

b. $\Pi_{Oid,Pid,Cid,Price}$ ($\sigma_{Price>100}$ (ORDER $\bowtie_{ORDER.oid= ORDER\_DETAIL.oid}$ (ORDER_DETAIL $\bowtie_{ORDER\_DETAIL.pid=PRODUCT.pid}$ PRODUCT)))

ONLY FOR SECTION (E, F)

a. SELECT c.cname, c.city
FROM customer c
WHERE c.cid = (
       SELECT o.cid
       FROM order AS o
       WHERE o.oid = (
               SELECT od.oid
               FROM order_detail od
               WHERE quantity = '1'
)
       );
	b. SELECT o.oid, c.cname, o.odate
	FROM order o
	INNER JOIN customer c ON o.cid=c.cid
	ORDER BY o.oid DESC;

Q3. *(15 points)* Specify the following queries in **SQL**

a. List the orders placed by the customer with cid =300 in the month of February 2018.

b. Find the id of the customers who have bought the products of *Nestle* and *Dunkin Brands*.

c. For each product, find the number of orders placed for it and also find the total quantity of each product sold till now. The output of this query (i.e. part C) for the above relational database state would be

ProductID	No. of Orders	Total Quantity Sold
10	4	8
70	1	6
40	1	4
50	1	5