B.TECH. (2020-24)

Artificial Intelligence

OPEN ENDED PROBLEM

on

DATABASE MANAGEMENT SYSTEMS

[CSE201]

Submitted To

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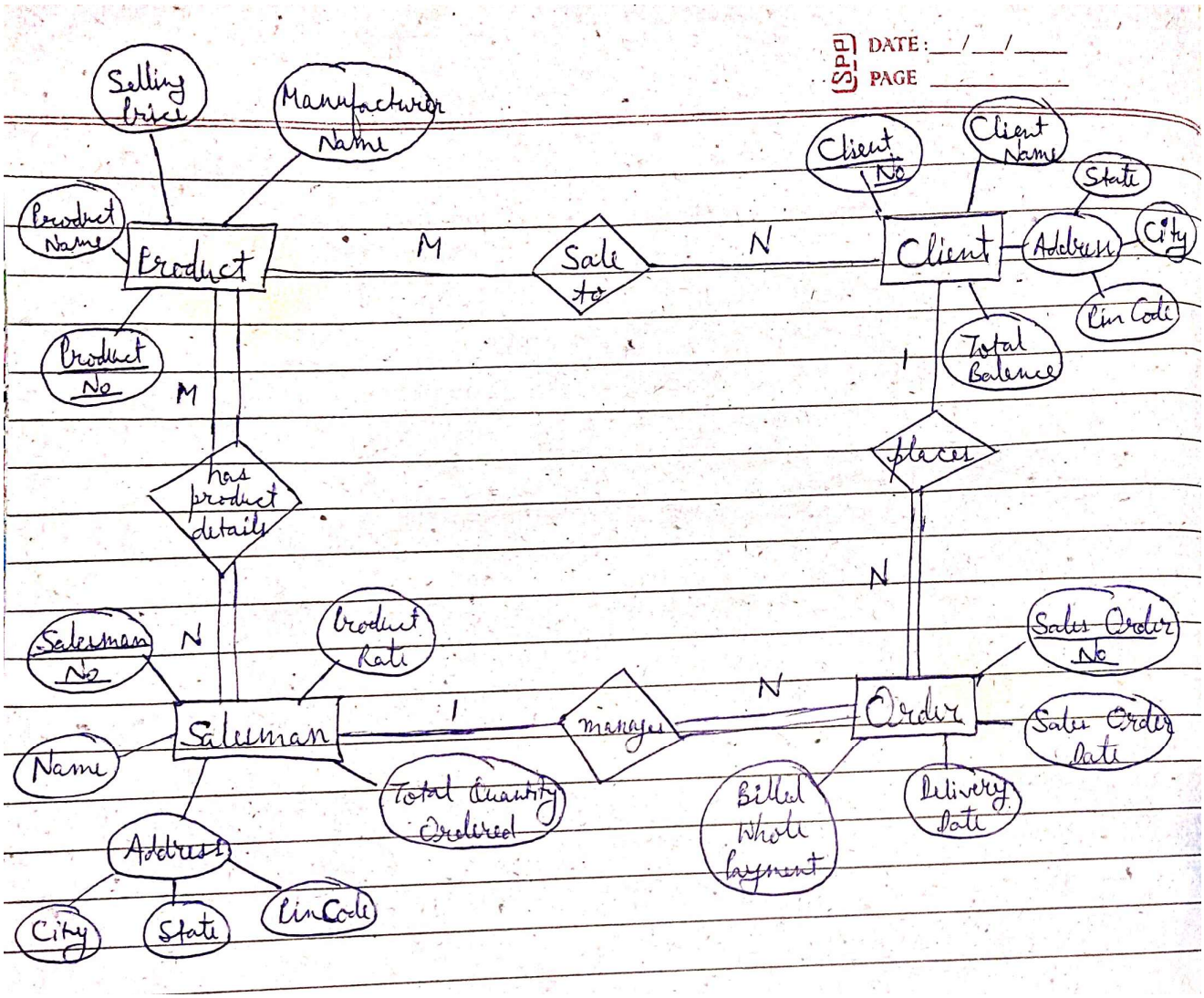
Open Ended Problem

CASE STUDY - 1

Q.1. A database is being constructed for storing sales information system. A product can be described with a unique product number, product name, selling price, manufacturer name. The product can sale to a particular client and each client have its own unique client number, client name, client addresses, city, pin code, state and total balance to be required to paid. Each client order to buy product from the salesman. In the order, it has unique sales order number, sales order date, client number, salesman number (unique), billed whole payment by the party or not and its delivery date. The salesman has the name, addresses, city, pin code, state, salary of the salesman, delivery date, total quantity ordered, product rate.

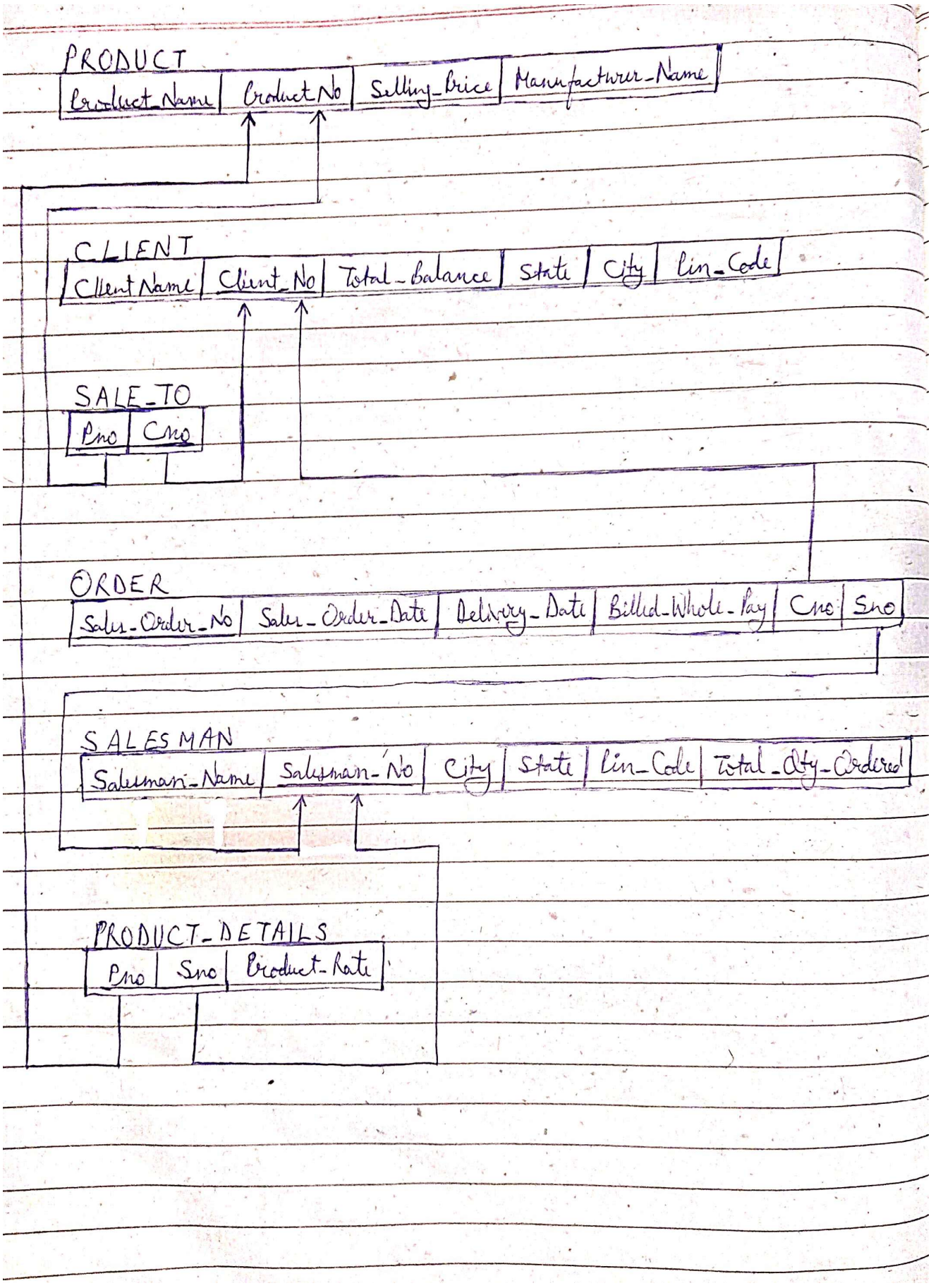
ER Diagram



❖ Assumptions taken for construction of ER Diagram

1. There can be some product which is not sold so there is partial participation from the side of entity 'Product' to entity 'Client'.
2. Some clients may not order any product but are still in client list as they may be regular (or potential) clients who may order later so partial participation.
3. An order can only exist if it has been placed by a client to a salesman, thus total participate from the entity 'Order'.
4. Some salesmen may not get any order to manage, so Partial Participation.
5. Each salesman would have product details for at least one product thus all salesmen would participate, and each product would have its details with some salesman because only then can they be sold, thus indicating total participation from both sides of the relation (has product details).
6. One product can be sale to many clients and one client can also buy many products thus the relation would have many-to-many cardinality.
7. A client may place more than one order while an order can only be placed by one client thus it would hold one-to-many cardinality from client to order.
8. A salesman may manage many orders, but one order can not be managed by more than one salesman which indicates one-to-many cardinality from salesman to order.
9. One salesman can have product details for one or more products and at the same time one single product can have its details with many salesmen. Thus, the relation between Product and Salesman would have many-to-many cardinality.

Relational Mapping



DDL Command Script to create Tables and Insert data to it

```
CREATE TABLE products
(
   pname varchar(20),
   pno number(10) PRIMARY KEY,
   sp real,
   mname varchar(20)
);

CREATE TABLE clients
(
   cno number(10) PRIMARY KEY,
   cname varchar(20),
   total_balance real,
   cstate varchar(20),
   city varchar(20),
   pincode number(10)
);

CREATE TABLE salesman
(
   sno number(10) PRIMARY KEY,
   sname varchar(20),
   city varchar(20),
   sstate varchar(20),
   pincode number(10),
   totalqty real
);

CREATE TABLE orders
(
   orderno number(10) PRIMARY KEY,
   sodate date,
   deldate date,
   billedpay real,
   cno number(10),
   sno number(10),

   CHECK (deldate > sodate),
   FOREIGN KEY (cno) REFERENCES clients(cno),
   FOREIGN KEY (sno) REFERENCES salesman(sno)
);

CREATE TABLE saleto
(
   pno number(10),
   cno number(10),
   FOREIGN KEY (pno) REFERENCES products (pno),
```

```
   FOREIGN KEY (cno) REFERENCES clients (cno),

   PRIMARY KEY (pno,cno)
);

CREATE TABLE productdetails
(
   pno number(10),
   sno number(10),
   productrate real,
   FOREIGN KEY (pno) REFERENCES products (pno),
   FOREIGN KEY (sno) REFERENCES salesman (sno),

   PRIMARY KEY (pno,sno)
);

CREATE TABLE orders2
(
   orderno number(10) PRIMARY KEY,
   sodate date,
   deldate date,
   billedpay real,
   cno number(10),
   sno number(10),

   CHECK (deldate > sodate),
   CHECK (sno = productdetails.sno),
   FOREIGN KEY (cno) REFERENCES clients(cno),
   FOREIGN KEY (sno) REFERENCES salesman(sno)
);

CREATE TABLE productdetails2
(
   pno number(10),
   sno number(10),
   productrate real,
   FOREIGN KEY (pno) REFERENCES products (pno),
   FOREIGN KEY (sno) REFERENCES salesman (sno),

   PRIMARY KEY (pno,sno)
);



INSERT INTO products VALUES('slipper',100,500,'paragon');
INSERT INTO products VALUES('Laptop',102,200000,'hp');
INSERT INTO products VALUES('Television',103,3000,'vermillion');

INSERT INTO clients VALUES(200,'jason',50,'kalos','lumious',110011);
INSERT INTO clients VALUES(201,'raph',500,'hoenn','mauville',120022);
INSERT INTO clients values(203,'nathon',60,'alola','hauoli',120011);
```

```
INSERT INTO salesman VALUES(300,'merchantA','coal','bituminous',130012,500);
INSERT INTO salesman VALUES(301,'merchantb','capricon','valley',140029,400);


INSERT INTO orders VALUES(401,'04/02/2022','04/20/2022',2000,203,300);
INSERT INTO orders VALUES(400,'04/01/2022','04/28/2022',2000,200,300);
INSERT INTO orders VALUES(402,'04/05/2022','05/02/2022',100,201,301);


INSERT INTO saleto VALUES(100,203);
INSERT INTO saleto VALUES(103,200);
INSERT INTO saleto VALUES(103,201);

INSERT INTO productdetails VALUES(100,300,3000);
INSERT INTO productdetails VALUES(102,300,3420);
INSERT INTO productdetails VALUES(103,301,3400);
INSERT INTO productdetails VALUES(103,300,400);
INSERT INTO productdetails VALUES(102,301,7777);
```

DML Commands

Viewing the Created Tables

```
select * from products
```

PNAME	PNO	SP	MNAME
slipper	100	500	paragon
Television	103	3000	vermillion
Laptop	102	200000	hp

```
select * from clients
```

CNO	CNAME	TOTAL_BALANCE	CSTATE	CITY	PINCODE
203	nathon	60	alola	hauoli	120011
200	jason	50	kalos	lumious	110011
201	raph	500	hoenn	mauville	120022

```
select * from saleto
```

PNO	CNO
100	203
103	200
103	201

```
select * from salesman
```

SNO	SNAME	CITY	SSTATE	PINCODE	TOTALQTY
300	merchantA	coal	bituminous	130012	500
301	merchantB	capricon	valley	140029	400

select * from orders

ORDERNO	SODATE	DELDATE	BILLEDPAY	CNO	SNO
402	04/05/2022	05/02/2022	100	201	300
400	04/01/2022	04/28/2022	2000	200	300
401	04/02/2022	04/20/2022	2000	203	301

select * from productdetails

PNO	SNO	PRODUCTRATE
100	300	3000
103	301	3400
103	300	400
102	300	3420

SQL Queries for Validation

1) Display the names of clients who have an 'p' as third letter in their name.

```
Select cname
from clients
where cname LIKE '__p%'
```

Output

CNAME
raph

2) Display the salesman names and delivery date for those salesmen who got orders with delivery date for month of May.

```
SELECT sname,deldate
from salesman,orders
where TO_CHAR(deldate, 'Mon') = 'May' AND salesman.sno = orders.sno
```

Output

SNAME	DELDATE
merchantA	05/02/2022

3) Display the name of all salesmen along with the product details of the products which they can sell to clients.

```
SELECT sname, pname
FROM salesman, products, productdetails
WHERE productdetails.sno = salesman.sno AND products.pno = productdetails.pno
```

Output

SNAME	PNAME
merchantA	slipper
merchantA	Laptop
merchantB	Laptop
merchantA	Television
merchantB	Television

4) Show the details for the Orders placed with client name, salesman, product name.

```
SELECT cname,sname,pname
FROM clients, salesman, products, saleto, orders
WHERE clients.cno = orders.cno AND salesman.sno = orders.sno AND saleto.cno = orders.cno AND saleto.pno = products.pno
```

Output

CNAME	SNAME	PNAME
raph	merchantB	Television
jason	merchantA	Television
nathon	merchantA	slipper

5) Display the names of clients who bought 'Television' in the format "jason buys Television from merchantA with down payment $ 2000"

```
select cname || ' buys ' || pname || ' from ' || sname || ' with down payment $ ' || billedpay  AS selling_details
from clients, products, saleto, salesman, orders
where pname = 'Television' AND saleto.pno = products.pno AND saleto.cno = clients.cno
    AND saleto.cno = orders.cno AND orders.sno = salesman.sno;
```

Output

SELLING_DETAILS
raph buys Television from merchantB with down payment $ 100
jason buys Television from merchantA with down payment $ 2000