

Name:- Ishu Agrawal

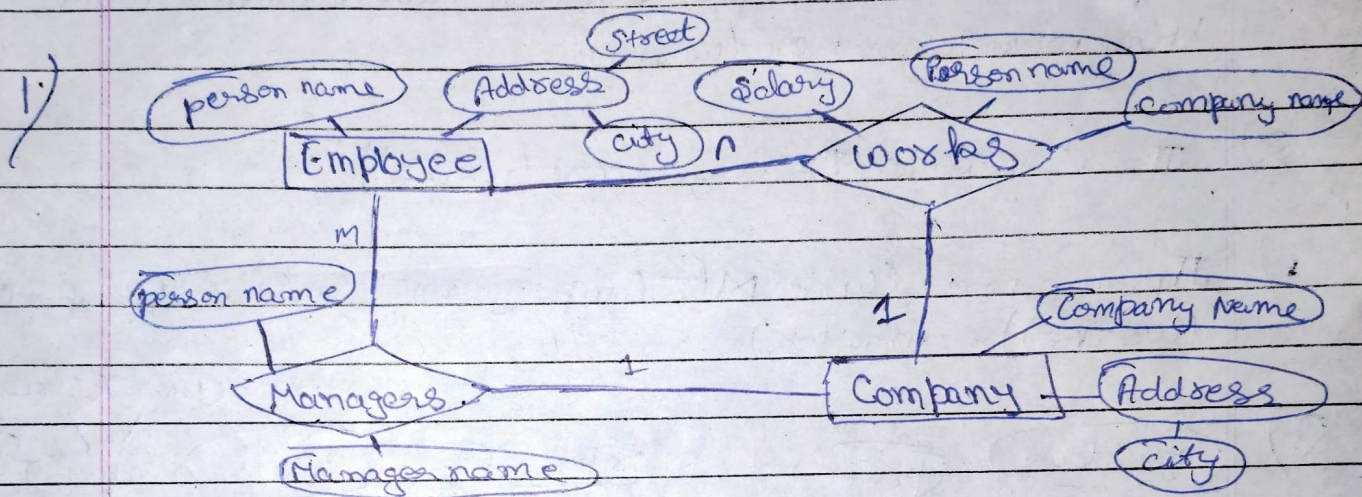
Roll No:- 24

Course:- B.Tech CS (AIM 1 & IoT)

University Roll No:- 2315510088

Subject:- Database Management (BCSC 0165)

Faculty:- Mr. Surendra Kumar



Employee: Primary key:- person name

Candidate key:- person name

Super key:- person name

Works: Primary key:- (person name, company name)

Candidate key:- (person name, company name)

Super key:- (person name, company name)

Foreign key:- person name, company name

Company: Primary key:- Company name

Candidate key:- Company name

Super key:- company name

Managers: Primary key:- (person name, manager name)

Candidate key:- (person name, manager name)

Super key:- (person name, manager name)

Foreign key:- person name, manager name

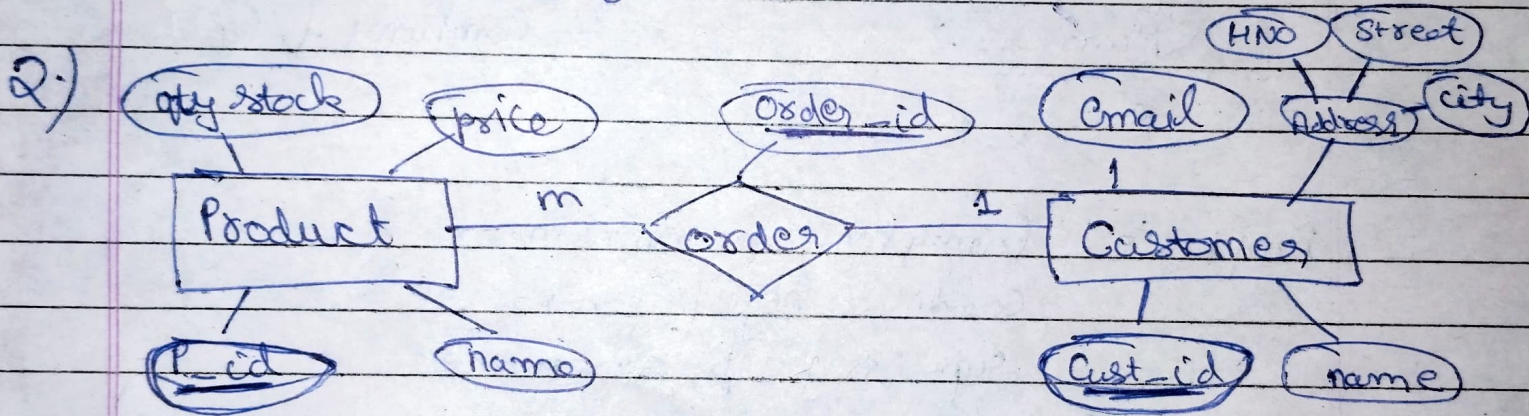
b) $\pi(\text{person-name}, \text{city}) (\sigma(\text{company-name} = \text{'First Bank Corporation'}) (\text{works}))$

c) $\pi(\text{person-name}, \text{city}) (\sigma(\text{company-name} = \text{'First Bank Corporation'}) (\text{works} \bowtie \text{Employee}))$

d) $\pi(\text{person-name} (\text{Employee}) - \pi(\text{person-name} (\sigma(\text{company-name} = \text{'First Bank Corporation'}) (\text{works})))$

e) $\pi(\text{person-name} (\sigma(\text{salary} > 10000 (\text{works})))$

f) $\pi(\text{person-name} (\text{works} \bowtie (\sigma(\text{company-name} = \text{'Small Bank Corporation'}) (\text{works}))) - \text{works})$



P_id : Product_id, Cust_id : Customer_id

3.) Use this attribute as part of the candidate key because the entity integrity constraint states that primary key value can't be null but the candidate key's attributes can contain a null value, hence it should be a part of Candidate key.

9.) $R = \{E, F, G, H, I, J, K, L, M, N\}$
 $E, F \rightarrow G$
 $F \rightarrow I, J$
 $E, H \rightarrow K, L$
 $K \rightarrow M$
 $L \rightarrow N$

Answer will be a. $\{E, F, H\}$

\therefore Closure of $\{E, F, H\}^+ \rightarrow G, E, F, H, I, J, K, L, M, N$

5.) Student Table

<u>Student-id</u>	Name	DoB	City	H-No	Street	Ph-No

Enrollment Table

<u>Student-id</u>	<u>Course-id</u>	<u>Enroll-id</u>	enrollment-date

Course Table

<u>Course-id</u>	Course Name	Student-id	Branch

Student table:- Student-id is the primary key.

Enrollment table:- It is the relationship between Student and Course table by many to one cardinality.

Course table:- Course id is the primary key and Student id is the foreign key referencing student id of Student table.

6) For possible no. of Super key = $2^n - 1$
where n = no. of attributes in a relation

7) Customer:- (i) cust # primary key for customer
order:- (ii) order # primary key for Order
cust # foreign key referencing customer
Order-item:-

(iii) Order # foreign key referencing order
item # foreign key referencing item.

Item:- (iv) item # primary key for item.

Shipment:- (v) order # foreign key referencing order.

(vi) warehouse # foreign key referencing warehouse.

Warehouse:- (vii) warehouse # primary key for warehouse.

Assumptions:-

Customer places order.

Order has order-item from item table

Shipment of order is done from warehouse.

2) a) π fid, fdate, time, src, dest (σ dest = 'New Delhi' (flight))

b) π fid, fdate, time, src, dest (σ src = 'Chennai' and dest = 'New Delhi' (flight))

c) π fid (σ pid = 123 and dest = 'Chennai' and fdate < '06/11/2023' (booking \bowtie { booking.fid = flight.fid } flight))

d) π pname (passenger - (π pname (passenger \bowtie { passenger.id = booking.pid } booking))