Semester: January 2024 – April 2024		
Maximum Marks: 30	**Examination: In-Semester Examination**	**Duration :**
Programme code: **Programme:**	**Class:** SY	**Semester:** IV **(SVU 2020/SVU 2023)**
Name of the Constituent College: **K. J. Somaiya College of Engineering**		**Name of the department:** COMP
Course Code: 116U01C403	**Name of the Course: RDBMS**	

Q.1 Draw the ER diagram for the following:
A company wants to develop a database system to manage its inventory and sales. The company sells multiple products, each with a unique product ID, name, price, and quantity in stock. Customers can place orders for one or more products, and each order has a unique order ID, date, and time. The company also wants to track customer information, including name, address, and phone number. Each order can have multiple products, and each product can be part of a single order. The system should also track the sales made by each employee, including their name and employee ID. Employees may be supervised by supervisors who are also employees.
Marking scheme:

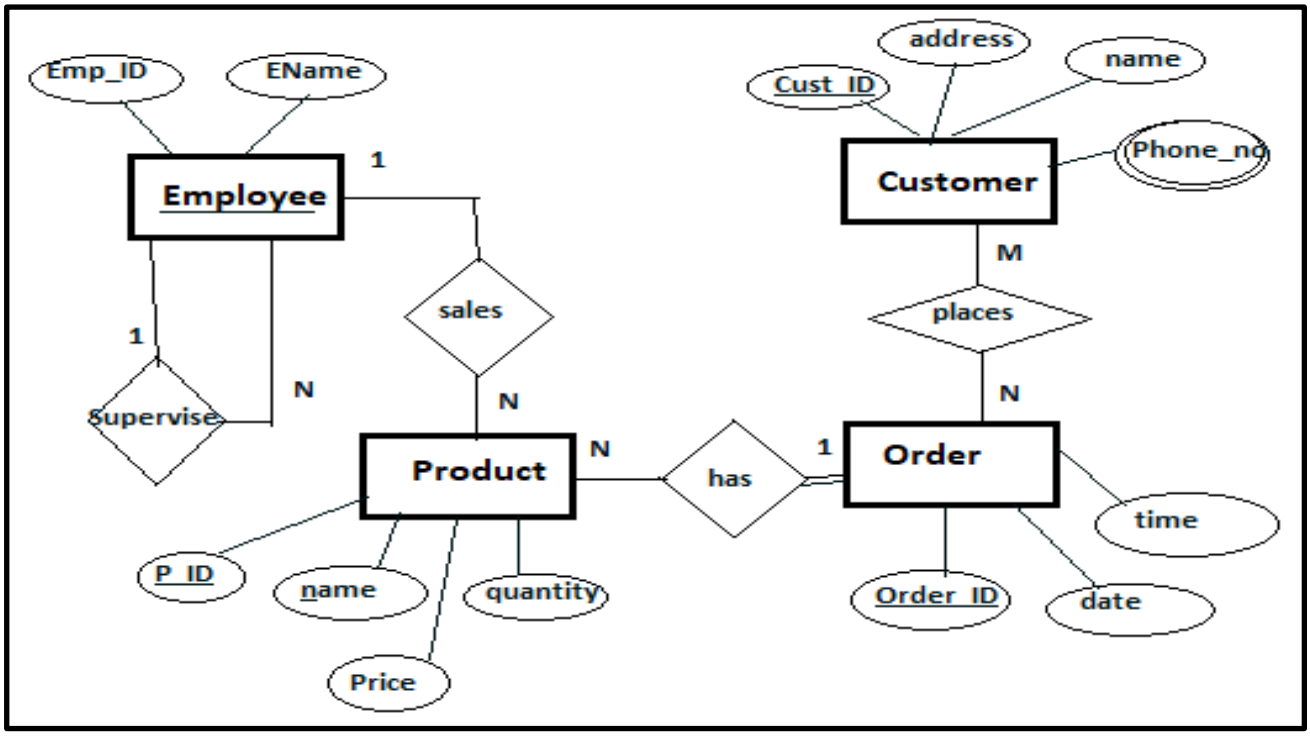
Entities with attributes- 4M

Relations- 4M

participation constraints- 1M

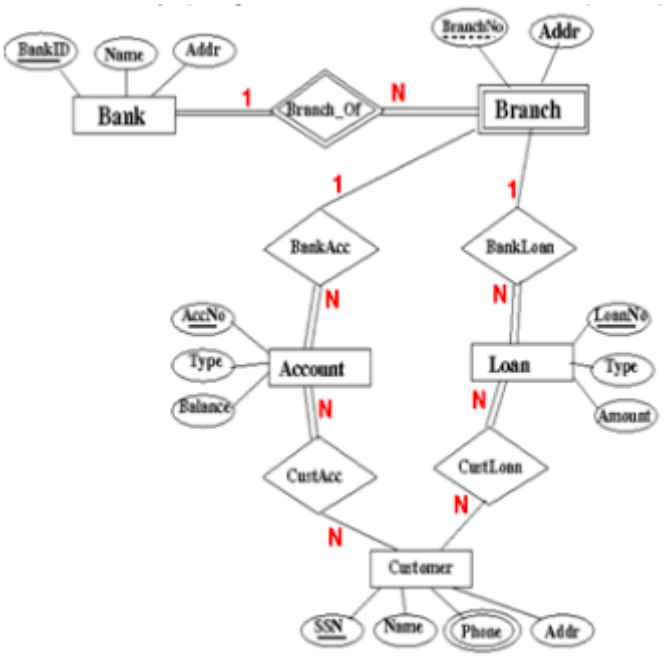
Mapping cardinality- 1M

ANS:



OR

Q1. a-Convert the above ER diagram to Relational Model



ANS:

Marking scheme:

(diagram with explanation)

mapping strong entities 1M

mapping weak entity 1M

mapping 1:N relationship 1M

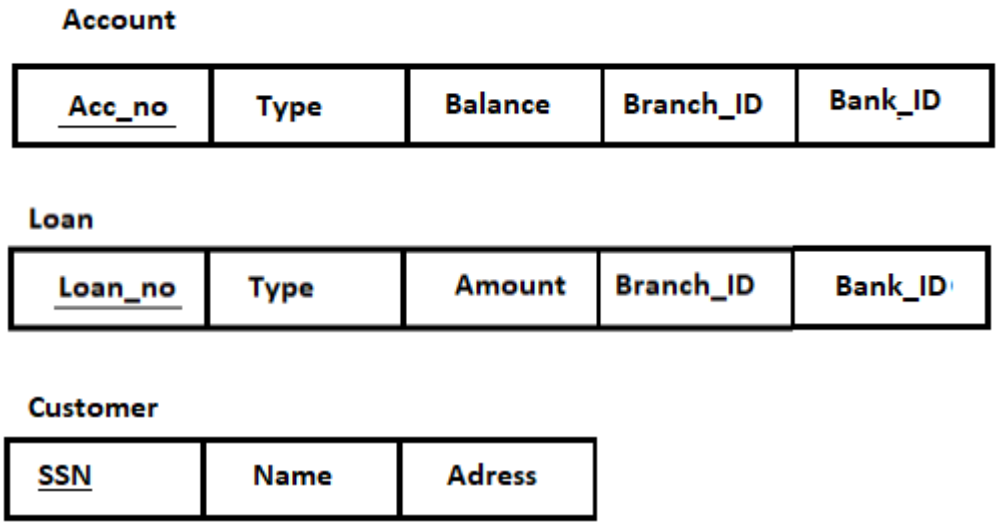
mapping M:N relationship 1M

mapping multivalued attribute 1M

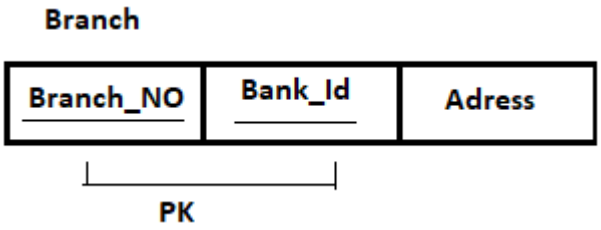
Strong Entity

Bank

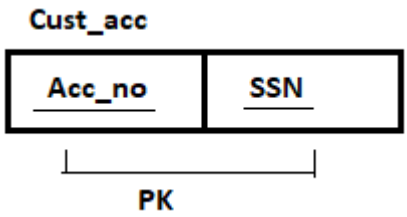
Bank_Id	Name	Adress



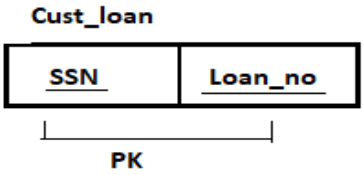
Weak entity



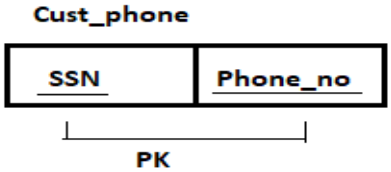
M:N Relationship



M:N Relationship



Multivalued attribute



Q.1.b -How Generalization is mapped to Relational model give example

Ans: Option 8B: Multiple relations-Subclass relations only

Create a relation Li for each subclass Si, 1 < i < m, with the attributes Attr(Li) = {attributes of Si} U {k,a1…,an} and PK(Li) = k. **(2M)**

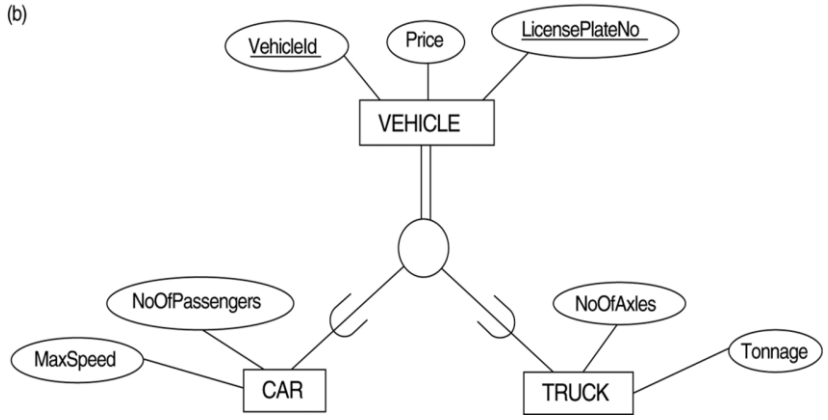


fig. Generalizing CAR and TRUCK into the superclass VEHICLE (1M)

(b) CAR

VehicleId	LicensePlateNo	Price	MaxSpeed	NoOfPassengers

TRUCK

VehicleId	LicensePlateNo	Price	NoOfAxles	

(2M)

Q.2 Consider the following relational Schema

employee (*employee-name*, *street*, *city*)
works (*employee-name*, *company-name*, *salary*)
company (*company-name*, *city*)
manages (*employee-name*, *manager-name*)

Ans:

marking scheme:

2 M for each query

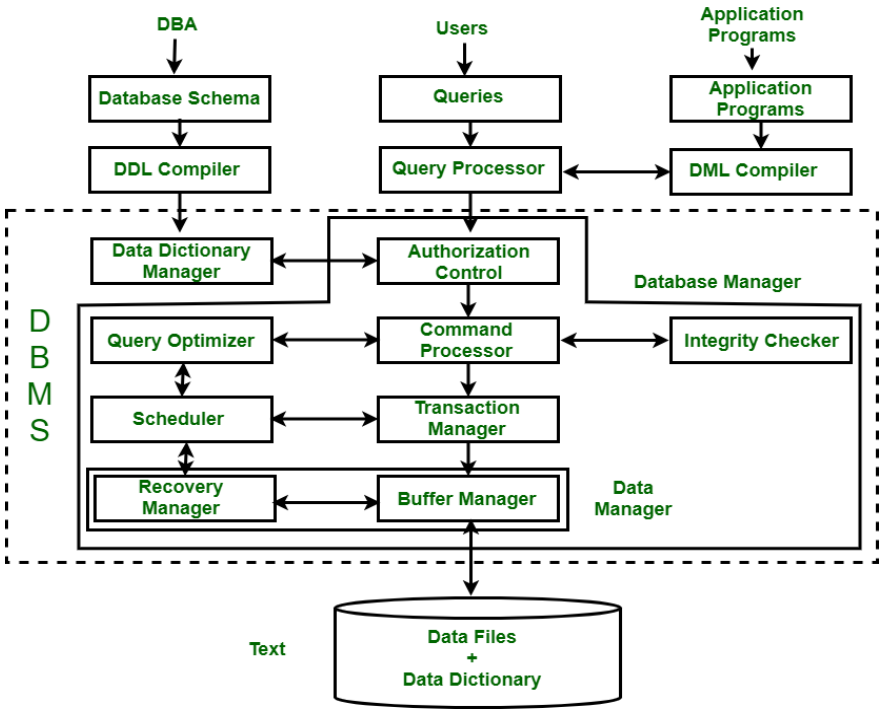
1. Find the names of the Employee who work for 'TATA' and earn more than 5 Lakh:
   Select emp_name from works where company_name='TATA' and salary > 500000;
2. Give a 10% raise in salary for all employee working for 'SBI':
   Update works set salary= salary+salary*0.1 where company_name="SBI";
   OR
   Update works set salary= salary*1.1 where company_name="SBI";

3. Delete all the employees who stay in ' Jammu' or 'GOA':
   Delete from employees where city in('Jammu','GOA');

OR
Delete from employees where city =‘Jammu’ or city=’GOA’;

4. Find the maximum salary given by each company:
   Select max(salary) from works group by company_name;
5. Add contact number of the manager:
   Alter table manages add column contact int(10);

Q.3 a) Draw the DBMS System Architecture and its components (5M)



b) **Consider the following relational Schema of Library:**
LIBRARY(Codeno, Name, No_of_books)
PERSON(Id, Name, Age)
Member(Codeno, Id,, Date_of_Books)
Book(Access_no, Title, Author, Price)
Borrowed_by(Access_no, Id, Date_of_issue)

Answer the queries using relational algebra
Ans:
i). List all the book titles having cost above Rs. 2000 (2M)
$\pi_{Title}(\sigma$ price>2000(Books))

ii). Give the details of the persons who have not borrowed any book (3M)
1)
R1←– $\pi_{Id,Name,Age}$ (person)
R2 ← σ_{Id} (Borrowed_by)
R1- π_{Id}(Person ⋈ borrowed_by)