VIT
Vellore Institute of Technology

Slot : B2+TB2

School of Computer Science Engineering and Information Systems

Fall Semester 2023-2024

Continuous Assessment Test – I

Programme Name & Branch: MCA

Course Name & code: Database Systems- PMCA503L

Class Number (s): VL2023240106719, VL2023240106183, VL2023240106187

Faculty Name (s) MUTHAMIL SELVAN T, KARTHIKEYAN J, TAPAN KUMAR DAS

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s):

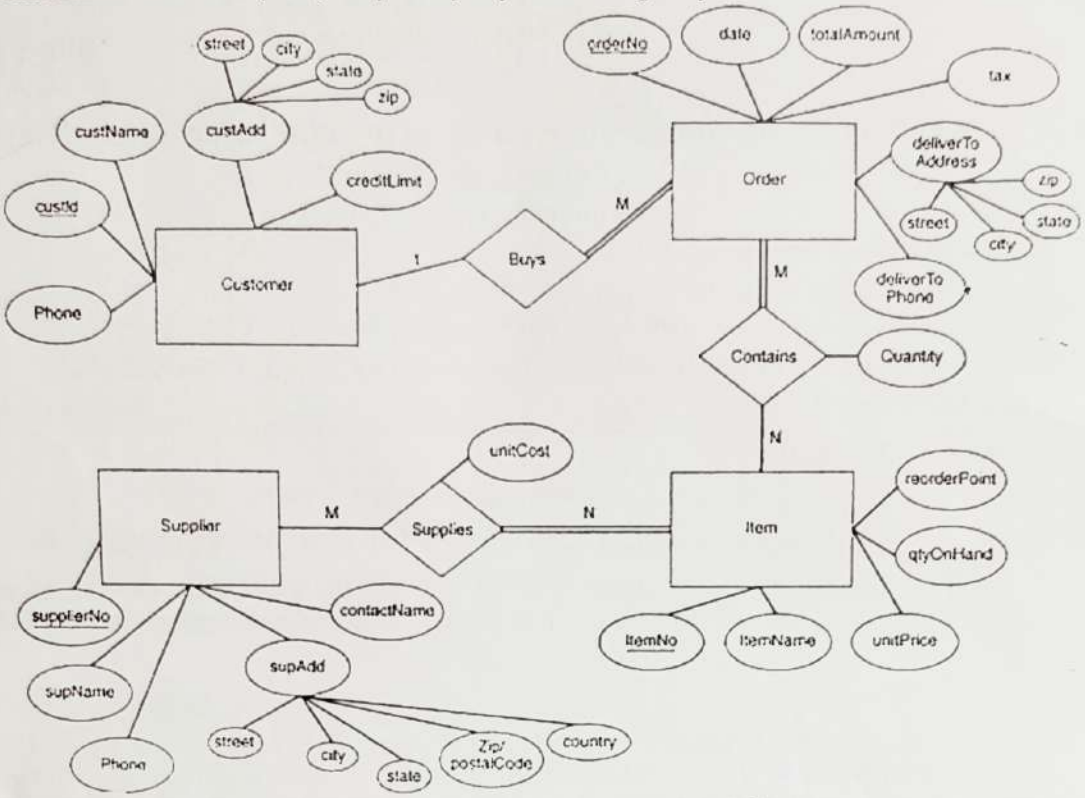
Q.No.	Answer all Questions	5X10= 50 Marks

1. Explain the difference between external, internal, and conceptual schemas. How are these different schema layers related to the concepts of logical and physical data independence?

2. Design an E/R diagram for the following database. The database is for storing flight details about an airline's fleet, flights, and seat bookings. Consider the following requirements list:

- ✓ The airline has one or more airplanes.
- ✓ An airplane has a model number, a unique registration number, and the capacity to take one or more passengers.
- ✓ An airplane flight has a unique flight number, a departure airport, a destination airport, a departure date and time, and an arrival date and time.
- ✓ Each airplane has home airport, home airport name, charge, airport code, last maintenance date.
- ✓ Each airport has airport id, name, city, country.
- ✓ Each flight is carried out by a single airplane.
- ✓ A passenger has given names, a surname, and a unique email address.
- ✓ A passenger can book their food preferences like vegetarian or non-vegetarian.
- ✓ A passenger can book a seat on a flight.
- ✓ Include airplane type as cargo airplane and passenger airplane. We may store maximum weight it can carry for cargo airplane and maximum number of passenger can travel for passenger airplane.

3. Figure below shows an ER schema for a customer order database. Map this schema into a relational schema and specify all primary keys and foreign keys.



4. List and explain all possible constraints violations for insert, delete and modify operations in relational database.

5. EMPLOYEE

ENAME	STREET	CITY
Ram	Civil line	Mumbai
Shyam	Park street	Kolkata
Ravi	M.G. Street	Delhi
Hari	Nehru nagar	Hyderabad

FACT_WORKERS

ENAME	BRANCH	SALARY
Ram	Infosys	10000
Shyam	Wipro	20000
Kuber	HCL	30000
Hari	TCS	50000

Write the output of following relational algebraic operations using the above tables. Write relational algebra query also with the output for the given joins.

a. EMPLOYEE – FACT_WORKERS
b. Π_{Ename}(Employee) U Π_{Ename} (FACT_WORKERS)
c. Equi join
d. Left outer join
e. Right outer join