

SE C MPN Sem IV NEP 2020 May-June 2026

Time: 2 Hrs

C MPN

Max. Marks: 60

- Note (1). Question No.1 is compulsory.
 (2). Out of the remaining attempt any three.
 (3). Assume and mention suitable data wherever required.

Q.1 Solve any Three out of Five. [5 marks each]

[15 Marks]

- [A] What is Weak and strong entity sets? Give Example.
 [B] Explain Projection (π) and Union(U) operators of Relational Algebra with example.
 [C] Explain Function Dependencies and FD closure.
 [D] Explain the concept of cloud databases.
 [E] Explain Transaction Rollback and Cascading Rollback.

Q.2 [A] An online food delivery platform manages information about restaurants, customers, orders, and delivery agents.

- Each **Restaurant** has a unique Restaurant_ID, Name, Location, and Contact Number.
 - A restaurant can offer multiple **Food Items**, each identified by Item_ID, Name, Price, and Category.
 - A **Customer** has Customer_ID, Name, Address, Phone Number, and Email.
 - Customers place **Orders**, where each order has Order_ID, Order_Date, Total_Amount, and Status.
 - An order can include multiple food items, and each food item can appear in multiple orders.
 - Each order is delivered by a **Delivery Agent**, who has Agent_ID, Name, Phone Number, and Vehicle_Type.
 - One delivery agent can deliver many orders, but each order is assigned to only one agent.
- (i) Identify all entities and their attributes.
 (ii) Determine the relationships among entities.
 (iii) Draw a neat Entity-Relationship (ER) diagram for the system.

[7 Marks]

[B] Explain any four join operations of SQL with example

[8 Marks]

Q.3 [A] Explain Generalization, Specialization and Aggregation for EER diagram. [7 Marks]

[B] Write Queries for

[8 Marks]

Patient (pid, pname, deptid, health_score, age, did) , **Department** (did, dname, location) ,
Doctor (did, dname, salary, deptid)

- (i) Find the names of patients admitted in the Cardiology department
 (ii) Update the salary by 10% for doctors working in departments located in Mumbai
 (iii) Count total number of patients in each department
 (iv) Get names of doctors earning more than the average salary

Q.4 [A] Explain two-phase locking protocol with Example.

[7 Marks]

[B] Explain 1NF, 2NF, 3NF with examples in detail.

[8 Marks]

Q.5 Solve any Three [5 marks each]

[15 Marks]

- A) Explain string operations in SQL with example.
 B) Explain ACID properties of transaction
 C) Write short note on NOSQL Database
 D) Draw State transition diagram illustrating the states for transaction execution and Explain each state.
 E) Explain how to map ternary relationship to table with example.
