

SE Sem III (NEP 2020) IT Dec 2025

QP code - 98813

Date 8/12/2025

Duration: 2 hours

[Max Marks:60]

- N.B. : (1) Question No 1 is Compulsory.  
(2) Attempt any three questions out of the remaining five.  
(3) All questions carry equal marks.  
(4) Assume suitable data, if required and state it clearly.



- 1 Attempt any THREE [15]  
a Explain data abstraction with its levels. [5]  
b Explain types of keys with example. [5]  
c What is functional dependency? What are its types? [5]  
d Draw and explain transaction state diagram [5]
- 2 a What is entity and attribute? Explain type of entity and attribute with example. [8]  
b Explain overall structure of DBMS with suitable diagram [7]
- 3 a Consider the following relations. [8]  
Sailors: (Sid, Sname, Rating, Age)  
Boats: (Bid, Bname, Color)  
Reserves: (Sid, Bid, Day)
- Write relational algebra queries for the following:  
1. Names of sailors who reserved a red boat  
2. Find colors of boats with names starting with 'C'  
3. Find names of sailors who have reserved boat no. 100  
4. Display sailor details who have rating at least 5
- b Explain function and procedure in SQL with example [7]
- 4 a Explain different types of joins in SQL with example [8]  
b Consider the following relation: [7]  
College(student\_id, course\_id, student\_name, course\_name, result, grade)  
Functional dependencies are:  
student\_id → student\_name  
course\_id → course\_name  
student\_id, course\_id → result  
result → grade  
Convert into 2NF and 3NF
- 5 a Explain Timestamp based protocol with example [8]  
b Explain integrity constraints in SQL with example [7]
- 6 a Explain conflict serializability with example [8]  
b Explain specialization, generalization and aggregation with example [7]