

6. Checkpoints are a part of

- A. Recovery measures
- B. Security measures
- C. Concurrency measures
- D. Authorization measures

ANSWER: A

7. A relational database consists of a collection of.

- A. Tables.
- B. Fields.
- C. Records.
- D. Keys.

ANSWER: A

8. A _____ in a table represents a relationship among a set of values.

- A. Column.
- B. Key.
- C. Row.
- D. Entry.

ANSWER: C

9. A transaction completes its execution is said to be.

- A. Saved.
- B. Loaded.
- C. Rolled.
- D. Committed.

ANSWER: D

10. Consider money is transferred from (1)account-A to account-B and (2) account-B to account-A. Which of the following form a transaction ?

- A. Only 1.
- B. Only 2.
- C. Both 1 and 2 individually.
- D. Either 1 or 2.

ANSWER: C

11. helps solve concurrency problem.

- A. locking.
- B. transaction monitor.
- C. transaction serializability.
- D. two phase commit.

ANSWER: A

12. If a transaction acquires a shared lock, then it can perform operation.

- A. read.
- B. write.
- C. read and write.
- D. update.

ANSWER: A

13. What are the ways of dealing with deadlock?

- A. Deadlock prevention. B. Deadlock recovery.
C. Deadlock detection. D. All of the mentioned.

ANSWER: D

14. The deadlock state can be changed back to stable state by using _____ statement.

- A. Commit. B. Rollback.
C. Savepoint. D. Deadlock.

ANSWER: B

15. In a two-phase locking protocol, a transaction release locks in phase.

- A. Shrinking phase. B. Growing phase.
C. Running phase. D. Initial phase.

ANSWER: A

Q2. Answer in one sentence.

1. What is a check point?
2. What is meant by starvation?
3. What is 2 phase Locking Protocol ?
4. Give any two advantages of 3 tier Architecture.
5. What is a shared lock?
6. State the purpose of revoke command.
7. State commits point.
8. What is cursor?
9. List the components of client-server system.
10. List the methods used for recovery from the deadlock
11. What are two levels for assigning privileges for discretionary Access Control Method?
12. Define transitive functional dependency.
13. List any two types of failures.
14. State difference between varchar & text data type of postgresQL?
15. What is view?
16. Define cascading rollback
17. State purpose of commit statement.
18. Define the term decomposition.
19. What are different types of locks?
20. State any two client components in client-server architecture.

21. Define serial schedule.
 22. Define cascading rollback
 23. Define cipher text.
 24. Define super key
 25. What is referential integrity?
 26. Give any two types of failure.
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Q.3. Short Notes.

1. Client-Server Architecture.
 2. Cursor
 3. View
 4. Trigger
 5. Deadlock
 6. Functional Dependency
 7. Decomposition
 8. Bad database design anomalies
 9. Client-Server Architectures
 10. Thomas Write Rule.
 11. Encryption
 12. Multivalued Dependency
 13. Second normal form
 14. BCNF
 15. Functional dependency
 16. Partial dependency
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Q.4 Short Answer questions.

1. Explain Thomas Write rule with suitable example.
2. What is a trigger? Explain how to create a trigger with proper example.
3. Discuss different types of transaction failure.
4. What is deadlock state? Explain Deadlock prevention schemes
5. What is a transaction?
6. Explain ACID property in detail.
7. What is a stored procedure? Explain how to create a stored procedure with suitable example.
8. Explain Discretionary access control and Mandatory access control for database security.
9. Explain granting and revoking of privileges along with the Access Matrix Model.
10. The following is the list of events in an interleaved execution of set of transaction T1, T2, T3 & T4 with two phase locking protocol. Construct a wait-for graph according to below request. Is there deadlock at any instance? Justify.

Time	Transaction	Code
t_1	T_1	Lock (A, X)
t_2	T_2	Lock (B, S)
t_3	T_3	Lock (A, S)
t_4	T_4	Lock (B, S)
t_5	T_1	Lock (B, X)
t_6	T_2	Lock (C, X)
t_7	T_3	Lock (D, S)
t_8	T_4	Lock (D, X)

11. Consider relations : $R(A, B, C, D, G, H, I)$ and Set of FDs defined on F as $\{A \rightarrow B, A \rightarrow C, CG \rightarrow H, CG \rightarrow I, B \rightarrow H\}$ Compute closure of f i.e. F^+ .
 12. Consider the following set of FDs. $\{DM \rightarrow NP, D \rightarrow M, L \rightarrow D, PQR \rightarrow ST, PR \rightarrow S\}$
Find canonical cover F_c .
 13. Consider the relation $R(B, C, D, E, F, G)$ and the set of FD's $F = \{B \rightarrow C, DE \rightarrow G, B \rightarrow D, DE \rightarrow F, C \rightarrow F\}$. Compute $(BE)^+$.
 14. Consider relation : $R = (A, B, C, D, G, H, I)$ and set of functional dependencies defined on R , f as, $f = \{A \rightarrow B, A \rightarrow C, CG \rightarrow H, CG \rightarrow I, B \rightarrow H\}$.
Find all Super Keys and Primary Keys for relation R .
 15. Consider the set of FD's F , defined for relation $R(A, B, C, D, E, F)$ as $F = \{AB \rightarrow C, C \rightarrow A, BC \rightarrow D, ACD \rightarrow B, BE \rightarrow C, CE \rightarrow FA, CF \rightarrow BD, D \rightarrow EF\}$
Find canonical cover F_c .
 16. Consider the following Relational Database :
Department (D_no, D_name, Location)
Employee (Eno, Ename, Edesg, Esalary, D_no)
Write a cursor to display the department details of employee "Mr. Joshi".
 17. Consider the following Relational Database :
Item (Itemno, Itemname, Qty)
Supplier (Suppliernr, Suppliername, Address, City, Phno)
I_S(Itemno, Suppliernr, Rate, Discount)
Define a trigger before updation on discount field, if the difference in the old discount and new discount be is entered is $> 15\%$ raise an exception and display corresponding message.
 18. Consider the following Relational Database :
Game (Game_no, Game_name, Team_size, Name_of_coach)
Player (Player_no, Player_name, Player_city) Game_Player (Game_no, Player_no)
Write a function which will take game name as a parameter and return total number of players playing that game. (d) Consider the following Relational Database: Publisher (P_no, P_name, P_addr); Book (B_no, B_name, Price, P_no);
Write a script, which will update the book details of book number entered by user. Raise exception if the given book number is not present or if the price of the book is greater than 500.
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Q.5 Long Answer questions.

1. A housing society needs to manage the administrative information related to the society. The society is made up of different types of flats like 2BHK, 1BHK, 3BHK. Each type has a well defined square-foot area. The outright sale rate & the rental value of the flat depend on the type of the flat. Each flat has a single owner. Each owner can have one or more flats in his name. The name, address, phone etc of the owner need to be maintained. For each flat, its type, the floor no, any internal specifications need to be maintained. The society also contains a club-house, which is rented out to flat owners, at a nominal rate for conducting various functions / programmes. Society would like to print reports like number of functions held in the club-house during a month / period etc. Every month maintenance amount is collected from the owners of the flats. Society needs to maintain this finance information, like how much amount collected for a month, whether any defaulters for a month, sending reminders to the defaulters etc. The expenditure information includes money spent on maintenance of the society like paying the sweepers, cleaners of the common area of the society, any emergency expense, salaries of the security etc.

Every month the society would like to print a report of expenditure versus collection.

1. Write a function to find out month with the least expenditure.
2. Write a procedure to list the names of owners, who have never conducted any functions in the clubhouse.
3. Write a procedure using cursor to display details of 3bhk flats that are currently vacant.

2. A music company wants to go in for automation of their requirements. They want to develop a database for maintaining the information of their music albums, singers, musicians, instruments. The following facts are relevant:

- a. Each album is produced by many musicians, a musician can produce many albums
- b. A singer can sing for many albums, but an album consists of songs of only one singer.
- c. A musician can play many instruments; an instrument can be played by many musicians.

The following constraints are to be placed on the relations

- a. each musician is paid a minimum of 50000 Rs. for each album
- b. all singers are from either Pune, Mumbai or Chennai
- c. each instrument cost is maximum 10000

Design the relational database for the above, so that the following queries can be answered:

1. Write a function to find out names of musicians who palsy at least one instrument same as the one "Joshi" plays.
2. Write a trigger after insert or update the record the if the albums released in 1998.
3. Create a view which contains details of the names of albums that have more than two instruments being played in it.