DBMS
FULL LENGTH TEST-1

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Question-1

Which of the following is not a feature of DBMS?

a) Minimum Duplication and Redundancy of Data

b) High Level of Security

c) Single-user Access only

d) Support ACID Property

Question-2

Which of the following is known as a set of entities of the same type that share same properties, or attributes?

a) Relation set

b) Tuples

c) Entity set

d) Entity Relation model

Question-3

The values appearing in given attributes of any tuple in the referencing relation must likewise occur in specified attributes of at least one tuple in the referenced relation, according to _____ integrity constraint.

a) Referential
b) Primary
c) Referencing
d) Specific

Question-4

Department (dept name, building, budget) and Employee (employee_id, name, dept name, salary)
Here the dept_name attribute appears in both the relations. Here using common attributes in relation schema is one way of relating _____ relations.

a) Attributes of common
b) Tuple of common
c) Tuple of distinct
d) Attributes of distinct

Question-5

The subset of a super key is a candidate key under what condition?
a) No proper subset is a super key
b) All subsets are super keys
c) Subset is a super key
d) Each subset is a super key

Question-6

A _____ integrity constraint requires that the values appearing in specified attributes of any tuple in the referencing relation also appear in specified attributes of at least one tuple in the referenced relation.

a) Referential
b) Referencing
c) Specific
d) Primary

Question-7

Consider a schema R(A, B, C, D) and functional dependencies: A B and C $\longrightarrow$ D. Then the decomposition of Rinto R, (AB) and R_2 (CD) is

(a) dependency preserving and lossless join (b) lossless join but not dependency preserving

(c) dependency preserving but not lossless join

(d) not dependency preserving and not lossless

join

Question-8

Consider the relation schema S = {A, B, C, D) and the following functional dependencies on S.

A⟶ BCD

B⟶C

CD⟶ A

Which of the following is true?

(a) Sis in 3 NF and also in BCNF

(b) (b) S is in 3 NF but not in BCNF

(c) S is in 2 NF but not in 3 NF

(d) S is in BCNF but not in 3 NF

Question-9

Consider a relation R(A B C D E) with sets of FD's F{A→B, BC→ E, ED→ A}Given R is in which highest normal forms?

(a) 1 NF

(b) 2 NF

(c) 3 NF

(d) BCNF

Question-10

Consider R=ABCDEFGH and the following FD's:

H-GD

E→ D

HD->CE

BD A

Identify the minimal cover of the given FD's?

(a) (H→ G, ED, H→C, HD→E, BD→ A}

(b) (HG, HD, ED, H→ C, BD→ A}

(c) (HG, ED, H→ C, HD→ C, BD→ A)

(d) {H→G, ED, H→ C, H→E, BD→A)

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Question-11

Which-one ofthe following statements about normal forms is FALSE?

a) BCNF is stricter than 3 NF

b) Lossless, dependency -preserving decomposition into 3 NF is always possible

c) Loss less, dependency – preserving decomposition into BCNF is always possible

d) Any relation with two attributes is BCNF

Question-12

Empdt1(empcode, name, street, city, state, pincode).

For any pincode, there is only one city and state. Also, for given street, city and state, there is just one pincode. In normalization terms, empdt1 is a relation in

a) 1 NF only

b) 2 NF and hence also in 1 NF

c) 3NF and hence also in 2NF and 1NF

d) BCNF and hence also in 3NF, 2NF and 1NF

Question-13

The algorithm that takes a set of dependencies and adds one schema at a time, instead of decomposing the initial schema repeatedly is

a) BCNF algorithm

b) 2NF algorithm

c) 3NF synthesis algorithm

d) 1NF algorithm

Question-14

Relation R with an associated set of functional dependencies, F, is decomposed into BCNF. The redundancy (arising out of functional dependencies) in the resulting set of relations is

a) Zero

b) More than zero but less than that of an equivalent 3NF decomposition

c) Proportional to the size of F+

d) Indeterminate

Question-15

Let R(A,B,C,D,E,P,G) be a relational schema in which the following FDs are known to hold:

AB->CD

DE->P

C->E

P->C

B->G

The relation schema R is

a) in BCNF

b) in 3NF, but not in BCNF

c) in 2NF, but not in 3NF

d) not in 2NF

Question-16

If a multivalued dependency holds and is not implied by the corresponding functional dependency, it usually arises from one of the following sources.

a) A many-to-many relationship set

b) A multivalued attribute of an entity set

c) A one-to-many relationship set

d) Both A many-to-many relationship set and A multivalued attribute of an entity set

Question-17

Suppose the user finds the usage of *room number* and *phone number* in a relational schema there is confusion.This is reduced by

a) Unique-role assumption

b) Unique-key assignment

c) Role intergral assignment

d) None of the mentioned

Question-18

Let R(a, b, c) and S (d, e, f) be two relations in which dis the foreign key of S that refers to the primary key of R. Consider the following four operations R and S

1. Insert into R
2. Insert into S
3. Delete from R
4. Delete from S

Which of the following is true about the referential integrity constraint above?

(a) None of 1, 2, 3 or 4 can cause its violation
(b) All of 1, 2, 3 and 4 can cause its violation
(c) Both 1 and 4 can cause its violation
(d) Both 2 and 3 can cause its violation

Question-19

A set of FDs is given for a relation R(A, B, C, D, E, F, G)

(A⟶B, BC⟶ DE, AEF⟶ G} What is the closure of {A, C)$^{+}$ under this set?

(a) A, B, C

(b) A, B, C, D

(c) A, B, C, D, E, F

(d) A, B, C, D, E

Question-20

Which the relation R with four attributes A, B, C and D the functional dependencies C⟶D)

{(A, B) (C, D) and

Which of the following statements is/are correct?

(a) C is key for relation R (b) R is in 3 NF

(c) Functional dependency C⟶ Dviolates 3 NF

(d) Ris in BCNF

Question-21

Given relations R(w, x) and S(y, z) the result of SELECT DISTINCT w,x FROM R, S; is guranteed to be same as R, if

(a) R has no duplicates and Sis non empty

(b) R and Shave no duplicates

(c) S has no duplicates and Ris non empty

(d) R and S have the same number of tuples

Question-22

Consider the following queries:

Q1: SELECT max (sal) FROM emp GROUP BY dept no HAVING dept no <>10;

Q2: SELECT max (sal) FROM emp WHERE dept no<>10 GROUP BY deptno;

Which of the following is false about queries?

(a) Both queries can be used for the required result

(b) Q1 is faster than Q2

(c) Q2 is faster than Q1

(d) None of these

Question-23

Consider the following relation schema pertaining to suppliers parts database S(S#, SNAME), P (P, COLOR) and SP denotes

the product of S and P. What does the following

SQL query produces? SELECT DISTINCTS. NAME

FROM S

WHERE S. S# IN (SELECT SP. S# FROM SP WHERE SP. P# IN (SELECT PP# FROM PWHERE P. COLOR="RED')).

(a) Get supplier names for suppliers who supply only RED parts

(b) Get supplier names for suppliers who supply atleast one red part

(c) Get supplier name for suppliers who do not supply red parts

(d) None of the above

Question-24

Consider the following relations:
Student (snum, sname, major, level, age) Class (name, meets at, room, fid)
Enrolled (snum.cname)
Faculty (fid, fname, deptid) What does the following query find?

```
SELECT C.name
FROM Class C
WHERE C.room = 'R128"
or C.name in (SELECTE.Cname) FROM Enrolled
EGROUP BY ECname HAVING count(*) >= 5)
```

(a) Finds the names of all classes that either meet in room R128 and have five or more students enrolled
(b) Finds the names of all classes that either meet in room R128 or have five or more students enrolled
(c) Finds the name of atmost one class that either meet in room R128 or have five or more students enrolled
(d) Finds the names of all classes that meet in room R128 that has five or more students it

Question-25

Which of the following queries will give the names of employee who is earning maximum salary?

(a) Select name from emp where sal = (select max (sal) from emp);

(b) Select name from emp where sal > all (select sal from emp):

(c) Both (a) and (b) are correct queries but processing is too high in B than in A

(d) Both (a) and (b) are correct queries but processing is too high in A than in B

Question-26

There are two relations X and Y. Relation X has arity 1 and 2 cardinality,relation Y has arity 3 and cardinality 4. Indicate the result of the SQL statement SELECT COUNT(*) FROM X, Y.

(a) 4

(b) 6

(c) 8

(d) Can not be calculated from given information

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Question-27

The standard SQL "ORDER BY clause

(a) can be used to order the columns used in select.

(b) may only be used when "GROUP BY" is used.

(c) can be used any place of query to order the Tuples

(d) can only be used as the last clause of a query to order the tuples.

Question-28

Consider the statements

S1: "Delete" is used to delete the table from database.

S2: "Truncate table" is used to delete all the data but not table.

S3: "Drop table" is used to delete the data as well as table

Which of the above statement(s) is/are true?

(a) S1 and S2

(b) S2 and S3

(c) S1 and S3

(d) S1, S2 and S3

Question-29

In SQL the statement Select * from R, S is equivalent to

(a) Select * From R natural join S

(b) Select * From R cross join S

(c) Select * From Runion join S

(d) Select * From Rinner join S

Question-30

A database table 71 has 4000 records and occupies 50 disk blocks. Another table 72 has 300 records and occupies 20 disk blocks. These two tables have to be joined as per a specified join condition that needs to be evaluated for every pair of records from these two tables. The memory buffer space available can hold exactly one block of records for T1 and one block of records for 72 simultaneously at any point in time. No index is available on either table. If Nested- loop join algorithm is employed to perform the Join, with the most appropriate choice of table to be used in outer loop, the number of block accesses required for reading the data are _____

Question-31

If transaction Ti gets an explicit lock on the file Fc in exclusive mode, then it has an _____ on all the records belonging to that file.

a) Explicit lock in exclusive mode
b) Implicit lock in shared mode
c) Explicit lock in shared mode
d) Implicit lock in exclusive mode

Question-32

Which refers to a property of computer to run several operation simultaneously and possible as computers await response of each other

a) Concurrency
b) Deadlock
c) Backup
d) Recovery

Question-33

All lock information is managed by a _____ which is responsible for assigning and policing the locks used by the transactions.

a) Scheduler

b) DBMS

c) Lock manager

d) Locking agent

Question-34

Which of the following is a procedure for acquiring the necessary locks for a transaction where all necessary locks are acquired before any are released?

a) Record controller
b) Exclusive lock
c) Authorization rule
d) Two phase lock

Question-35

. A system is in a _____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.

a) Idle
b) Waiting
c) Deadlock
d) Ready

Question-36

When transaction Ti requests a data item currently held by Tj, Ti is allowed to wait only if it has a timestamp larger than that of Tj (that is, Ti is younger than Tj). Otherwise, Tj is rolled back (Tj is wounded by Ti). This is

a) Wait-die
b) Wait-wound
c) Wound-wait
d) Wait

Question-37

Selecting the victim to be rollbacked to the previous state is determined by the minimum cost. The factors determining cost of rollback is

a) How long the transaction has computed, and how much longer the transaction will compute before it completes its designated task

b) How many data items the transaction has used

c) How many more data items the transaction needs for it to complete

d) All of the mentioned

Question-38

If a node is locked in _____ the subtree rooted by that node is locked explicitly in shared mode, and that explicit locking is being done at a lower level with exclusive-mode locks.

a) Intention lock modes
b) shared and intention-exclusive (SIX) mode
c) Intention-exclusive (IX) mode
d) Intention-shared (IS) mode

Question-39

In an E-R diagram, Y is the dominant entity and X is a subordinate entity. Then which of the following is incorrect:

(a) Operationally, if Y is deleted, so X is alsodeleted

(b) X existence is dependent on Y

(c) Operationally, if X is deleted, so Y is also deleted

(d) Operationally, if X is deleted, Y remains thesame

Question-40

Map the following statements with True (T)/ False (F)

S1: Participation of the weak entity set in identifying relationship must be total.

S2: Multivalued attributes in E-R diagram require separate tables when converted into relational model with satisfy 2NF.

(a) FT

(b) TF

(c) FF

(d) TT

Question-41

Consider the following database schema:

Course(course.no, dep_name)

Enroll(stud id.course_no, status) SELECT stud id

FROM Course C, Enroll E

WHERE C.course_no = E.course_no and dep_name = 'CS

EXCEPT

SELECT stud jd FROM Course C, Enroll E

WHERE E.course_no = C.course_no AND

dep.name = 'ME' Above SQL query

(a) Finds the students who are enrolled in all courses by CS department are not enrolled in all courses offered by ME department

(b) Finds the students who are enrolled in any course by CS department and not enrolled in all courses offered by ME department

(c) Finds the students who are enrolled in atleast one course by CS department and not enrolled in any courses offered by ME department

(d) Finds the students who are enrolled in all course by CS department and not enrolled in courses offered by ME department

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Question-42

Consider the relation
Project (pno, pname, budget, city)
Q1: SELECT pname FROM proj
WHERE NOT (budget <= ANY (SELECT budget
FROM proj
WHERE city = 'KANPUR'))
Q1 computes:
(a) Name of the projects whose budgets is less than atleast one project in KANPUR
(b) Name of the projects whose budgets is greater than some project in KANPUR
(c) Name of the projects whose budgets is less than all project in KANPUR
(d) Name of the projects whose budgets is greater than all project in KANPUR

Question-43

Consider the relations:
Proj (pid, pname, budget, city) Q: SELECT pname
FROM proj P_1
WHERE NOT EXISTS
(SELECT budget
FROM proj P_2
WHERE city = 'DELHI'
AND P..budget <= P_2.budget)
Q finds project name whose budget is
(a) greater than some project in DELHI
(b) greater than all project in DELHI
(c) less than all project in DELHI
(d) less than any project in DELHI

Question-44

SELECT	1
FROM	2
WHERE	3
GROUP BY	4
HAVING	5
ORDER BY	6

What is correct order for evaluating an SQL statement? (Where order is 6 digit number)

Question-45

Which of the following queries will give the names of the employees who are earning maximum salary?

(a) Select name from emp

where sal = (select max(sal) from emp)

(b) Select name from emp where sal >= (select sal from emp)

(c) Both (a) and (b) are correct queries but the processing time is too high in (b) than in (a)

(d) Both (a) and (b) are correct but processing is too high in (a) than in (b

Question-46

Consider the following relation schema: Author (A_name, A_city) Book (B_title, A_name, P_name, Price)

Publisher (P_name, P_city)

From the queries given below, which query is syntactically and logically incorrect for above schemas:

(a) SELECT B_title, Price from BOOK Where P_name IN (Select P_name, P_city

from Publisher where P_City = "Delhi");

(b) SELECT P_name, A_name,

B_title from BOOK Where price BETWEEN 1000 AND (Select avg (price) from BOOK

where P_name = "TMH")

(c) SELECT A_name, A_city, Count (P_name FROM Author, BOOK Where Author.A_name = BOOK.A_name GROUP by A_name) having COUNT (P_name) > 5

(d) All of these

Question-47

Suppose a phone book contain 500 pages and each page can contain upto 500 records.Suppose we want to search for a particular name in a phone book. Give a worst case bound on number of pages that must be looked to perform a search using an index for the name of the first entry of each page.

(a) 1

(b) 2

(c) 9

(d) 500

Question-48

Given a data file with 100 records per page and 1000 pages and on index page capacity of 512 index entries, how deep should be the B tree to index this file.

(a) 1

(b) 2

(c) 3

(d) 4

Question-49

In a database file, the search key field is 9 bytes long the block size is 512 bytes, a record pointer is 6 bytes and block pointer is 7 bytes. The largest possible order of a non leaf node in B+ tree implementing this file structure (order defines maximum number of keys present}

(a) 23

(b) 31

(c) 32

(d) 42

Question-50

Consider the following schedule.

$W_1(y), R_1(x), R_1(w), W_1(w), W_2(x), C_2, W_3(w) C_3, W_4(w), C_4, W_1(z) C_1$

Which of the following transaction order is not possible in the given serializable schedule?

(a) T1 -> T2 -> T3 -> T4

(b) T⟶T3⟶ T2⟶ T4

(c) T_{1} -> T3-> T4 -> T2

(d) T1 -> T2-> T4 -> T3

Question-51

Consider the following schedule.

$R_1(x)$; $R_2(x)$ $W_1(x)$; $R_2(y)$; $W_1(x)$; C_2, A_1;

The above schedule is

(a) Recoverable and conflict serializable

(b) Recoverable and not conflict serializable

(c) Not recoverable and conflict serializable

(d) Not recoverable and not conflict serializable

Question-52

Consider the given schedule

The given schedule is

(a) Recoverable and cascadeless

(b) Recoverable but not cascadeless

(c) Not recoverable

(d) Recoverable, cascadeless and strict

T1	T2
R(x)	
	R(x) R(y) X=x+y
R(x)	
	commit
commit	

Question-53

Match List-I with List-II and select the correct answer using the codes given below the lists:
List-I (Schedule name)
A. Recoverable
B. Csecade less
C. Strict
D. Non-recoverable
List-II (Schedule with example)
1. R1}(A), W2(B), R1(B), C1, C2
2. W1(A), W2(A), C2, W1(A), C1
3. R1(A), W2(B), C2, R1(B), W1(B) C1
4. R1(A) , W2(B) , R1(B) C2, C_1;
Codes:

	A	B	C	D
a)	1	2	3	4
b)	4	3	2	1
c)	4	2	3	1
d)	1	2	4	3

Question-54

Consider the following schedule

S_1. S: R(C) R2(C) W_1(A) W_2(A) W,(C) R,(B) R_2(B)

W_1(B) W,(D) W_2(B) W_2(D) R_1(F) W_2(E) R3(F)

Let 'X' be the number of 'blind-write' operations in the given schedule and 'Z' be the number of conflict equivalent serial schedules to S_1. The value of X ✶ Z is_____

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Question-55

Consider the transactions T_1, T_2, and T, and the schedules S, and S_2 given below.

T: (X); (Z); wi(X); wi(Z)

T_2: 12(Y); r2(Z); w2Z)

T_3: 13(Y); r3(X); w3(Y)

S_1: (X); r3 (Y); r3(X); r2(Y); r2(Z); w3(Y);

w2(Z); (Z); w1(X); w(Z)

S_2: (X); r3(Y); 2(Y); r3(X); w2(Z); r(Z); r2(Z);

w3(Y); w1(X); w1(Z)

Which one of the following statements about the schedules is true?

(a) Only S_1, is conflict-serializable.

(b) Only S_2 is conflict-serializable.

(c) Both S_1, and S_2 are conflict-serializable.

(d) Neither S_1, nor S_2 is conflict-serializable

Question-56

Consider the following schedule:

l1(A) R1(A) , u1(A) , l2(A) W2(A) , u2(A) l1(A) . W1(A), u1(A)

Identify the schedule?

(a) Schedule satisfies 2PL and conflict serializable

(b) Satisfies 2PL and non-conflict serializable

(c) Not satisfies 2PL and conflict serializable

(d) Not satisfies 2PL and not conflict serializable

Question-57

Match List-I (Simultaneously held locks on some object) with List-II (Group-mode for locks, if they are compatible) and select the correct answer using the codes given below the lists:

List-1

A. S, S, IS 1. S

B. IX, IS, IS 2.IX

C. IX, X 3.SIX

D. SIX, IS 4.Not possible

Codes:

	A	B	C	D
a)	1	2	3	4
b)	1	2	4	3
c)	1	3	2	4
d)	1	3	4	2

Question-58

2PL guarantees serializability, but it does not prevent deadlocks. 2PL has two phases: growing and shrinking. Which of the following rules are used to govern the 2PL protocol?

(a) Two transactions can not have conflicting locks.

(b) No unlock operation can precede a lock operation in the same transaction.

(c) No data are affected until all locks are obtained i.e, until the transaction is in its locked point.

(d) All of these

Question-59

In wait-die scheme, transactions T1, and T2 have timestamps 7 and 9 respectively. If T1 requests a data item held by T2 then

(a) T1 will wait

(b) T1 will be rolled back

(c) T2 will wait

(d) T2 will be rolled back

Question-60

In wound-wait scheme, transactions T1 and T2

have timestamps 7 and 9 respectively. If requests a data item held by T2 then T1

(a) T1will wait

(b) T1 will be rolled back

(c) T2 will wait

(d) T2 will be rolled back

Question-61

Which of the following statements is true?

(a) Wait-die is a preemptive technique

(b) Wound-wait is a non-premptive technique

(c) Wait-die and would-wait are the schemes for deadlock recovery

(d) Wound-wait and wait-die schemes avoid stravation

Question-62

Consider the schedule given below. T_1 and T_2 are two transactions and x and y are two resources.

The schedule indicates

(a) serializable schedule

(b) non-serializable schedule

(c) A deadlock schedule

(d) None of the above

T1	T2
Read lock(y);	
Read item(y);	
	Read lock(x);
	Read item(x);
Write lock(x);	
	Write lock(y);

Question-63

Which of the following is true about 2-phase locking protocol?

S1 : Lock upgradation and degradation are allowed only in shrinking phase.

S2:2-phase locking allows lock degradation in shrinking phase.

(a) Only S1,

(b) Only S2

(c) Both S1 and S2

(d) Neither S1 nor S2

Question-64

Consider the following functional dependencies in a database:

Date of Birth → Age

Age → Eligibility

Name→ Roll_number Roll number→ Name

Course_number→→→ course_name

Course_number→ Instructor (Roll_number, Course_number) → Grade The relation (Roll_number, Name, date of birth,

Age) is

(a) In 2NF but not in 3NF

(b) in 3NF but not in BCNF

(c) in BCNF

(d) None of the above

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Question-65

Consider the following instance:

X	Y	Z
1	4	2
1	5	3
1	6	3
3	2	2

Which one of the following correctly describe the functional dependency hold by above instance.

(a) XY->Z and Z -> Y

(b) YZ -> X, Y->Z and Y -> X

(c) YZ->X and X -> Z

(d) XY->Y and X⟶ Z

SOLUTION

Solution-1

Answer: c

Explanation: Single-user Access only” is not a feature of DBMS. DBMS allows multiple users to access and manipulate the database concurrently. It provides mechanisms to handle concurrent access and ensure data consistency and integrity among multiple users.

The important features of a database management system are:

Minimum Duplication and Redundancy of Data

High Level of Security

Mulitple-user Access

Support ACID Property

Solution-2

Answer: c
Explanation: In the actual world, an entity is a distinct “thing” or “object” from all other objects. For example: Each employee of an organization is an entity.

Solution-3

Answer: a
Explanation: Consider 2 relations r1 and r2. r1 may include among its attributes the primary key of relation r2. This attribute is called a foreign key from r1, referencing r2. The relation r1 is also called the referencing relation of the foreign key dependency, and r2 is called the referenced relation of the foreign key.

Solution-4

Answer: c
Explanation: Here the relations are connected by the common attributes

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Solution-5

Answer: a
Explanation: The subset of a set cannot be the same set. Candidate key is a set from a super key which cannot be the whole of the super set.

Solution-6

Answer: a
Explanation: A relation, say r1, may include among its attributes the primary key of another relation, say r2. This attribute is called a foreign key from r1, referencing r2. The relation r1 is also called the referencing relation of the foreign key dependency, and r2 is called the referenced relation of the foreign key

Solution-7

R1(AB) R2(CD) for R(A, B, C, D)

For losssless join, 3 conditions must hold by relations R_{1} and R_{3}

(1) R1 U R2 = R

AB U CD =ABCD = R

True

(2) R 1 intersection R2 != phi

AB U CD = phi

So, not lossless join.

For dependency preserving.

False

In R1(AB) A -> B

A+ = AB A candidate key for R1

In R2(CD) C -> D

C+= CD Ccandidate key for R2 So, the decomposition is dependency preserved but not lossless.

Solution-8

Answer(b)

F= (A⟶BCD, B⟶ C, CD⟶ A

A ABCD CD = ABCD

So candidate keys are (A, CD)

Prime attributes are (A, C, D)

Check for BCNF:

A->BCD (A is candidate key) B->CX(Bis not candidate key)

CD->A (CD is candidate key)

Check for 3NF: A->BCD (A is candidate key)

B->C(Cis prime attribute)

CD->A (CD is candidate key)

Solution-9

Answer(c)

F = {A -> B, BC -> E, ED -> A}

A^{+} =A,B,

$(BC)^{+}$ =B,C,E

$(ED)^{+}$ =E,D,A,B

So candidate keys may be (EDC, BCD, ACD) and prime attributes are {A, B, C, D, E)

BCNF: | fx \rightarrow then x should be candidate key then the relation will be in BCNF. In the given FDs set {A -> B BC -> E, ED -> A }x may be A or BC or ED which are not candidate key so given relation is not in BCNF.

3NF: If x->y then (i) x should be candidate key, or (ii) y should be prime attribute in our given relation y may be B, E, A, which are prime attributes. So given relation is in 3 NF.

Solution-10

Answer(d)
Postal Study Package
Given FDs:
H -> GD E -> D
HD -> CE
BD -> A
(1) Right reduced FDs:
H -> G H -> D
E -> D
HD -> C
HD -> E
BD -> A
(2) Left reduced FDs:
H -> G
H -> D
E -> D
H -> C
H -> E
BD -> A
(3) Minimal cover:
H -> G
E -> D
H -> C
H -> E
BD -> A

Solution-11

Answer: c

Explanation: We say that the decomposition is a lossless decomposition if there is no loss of information by replacing r (R) with two relation schemas r1(R1) andr2(R2).

Solution-12

Answer: b

Explanation: The relation in second normal form is also in first normal form and no partial dependencies on any column in primary key.

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Solution-13

Answer: c
Explanation: The result is not uniquely defined, since a set of functional dependencies can have more than one canonical cover, and, further, in some cases, the result of the algorithm depends on the order in which it considers the dependencies in Fc.

Solution-14

Answer: b
Explanation: Redundancy in BCNF is low when compared to 3NF. For more details on BCNF.

Solution-15

Answer: d
Explanation: From the closure set of attributes we can see that the key for the relation is AB. The FD B->G is a partial dependency, hence it is not in 2NF.

Solution-16

Answer: d

Explanation: For a many-to-many relationship set each related entity set has its own schema and there is an additional schema for the relationship set. For a multivalued attribute, a separate schema is created consisting of that attribute and the primary key of the entity set.

Solution-17

Answer: a
Explanation: A desirable feature of a database design is the unique-role assumption, which means that each attribute name has a unique meaning in the database.

Solution-18

Answer .d

Referential integrity constraint

In relational model, two relation are related to each other over the basis of attributes. Every value of referencing attribute must be null or be available in the referenced attribute.

R(a, b, c) and S(d, e, f)

here d is the foreign key of S that refers to the primary key of R.

1. Insert into R will not cause any voilation.

2. Insert into S may cause violation because for each entry in 'S' it must be in 'R. 3. Delete from Rmay cause violation because

for the deleted entry in R there may be referenced entry in the relation S.

4. Delete from Swill not cause any violation.

Hence (d) is the correct option.

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Solution-19

Answer(d)

R(A, B, C, D, E, F, G)

As A -> B

BC -> DE

$(AC)^+ = \{A, B, C, D, E\}$

Hence (d) is the correct option

Solution-20

Answer(c)

{(A, B) (C, D) and C -> D }

for (A, B) -> (C, D)

The candidate key is A B also if C -> D i.e. non key going for non-key hence C is neither a key and D is not a prime attribute hence C -> D violating 3NF condition.

Hence (c) is correct option

Solution-21

If R contains duplicate values then the query will not select those duplicate values, i.e. Rx S c R and RxS!=R.S may or may not have duplicates.

Solution-22

Answer. B

Q1 is slower than Q2 because Q1 groups the department no. without filtering. Whereas Q2 filters the data first that is it removes all those tuples where department No .=10 and then groups them.

Solution-23

Answer.b

The inner most query returns P# of those parts whose color is red.
The outer query returns all those suppliers who supply atleast one red part "Atleast" is used because of IN operator.

Solution-24

Answer . B

The query gives the names of those classes whose room number is 'R128" or have 5 or more students enrolled

Solution-25

16 Answer c

Both (a) and (b) will give the name of employee who is earning maximum salary.

(a) Select name from emp

where sal (select max(sal) from emp): in this nested query the inner query will go through all n tuples of emp database table, and will output 1 record. For this 1 record the outer query will output the name. So the processing time is O(n).

(b) Select name from emp where sal>= all (select sal from emp); in this nested query for every tuple of outer query, its salary attribute will be checked with all tuple from inner query. Hence processing time will be $O(n^2)$ and $O(n)<0(n)^2$ so processing time in (b) is higher than (a

Solution-26

Answer .c

For relation X cardinality=2

For relation Ycardinality 4

Hence the SQL statement Select COUNT(") from X, Y gives the number of rows for the relation obtained from cross product of X, Y.

Hence, 2 x 4=8 is the correct option

Solution-27

. Answer(d)

"Order by clause is used to order the tuples and it can only be used as the last clause of a query

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Solution-28

Answer .b

"Delete" is used to delete the data specified in the where clause. If where cause is absent then it will delete all the data from the table.
"Truncate table" is used to delete all the data but not able

“Drop table” is used to delete the data as well as the table

Solution-29

Answer .b

Even through the R and S may have common attributes it would give output as cross-product unless we give explicit condition for tuple matching.

To make it equivalent to natural join we have to use WHERE condition to match the common attributes.

Solution-30

Answer(15020)

Nested Loop algorithm will involve n,x b_{12}+ b, block transfers. n, records in relation r, b, blocks in

relation n, records in relation s, b, blocks In

relation s Either 71 can be R or 72. If Ris T1 then total number of block access is

4000 x 20+ 50-80050

If R is 72 then total number of block access. is 300 x 50+ 20 = 15020
Better one is the second case, total number of block accesses (15020).

Solution-31

Answer: d

Explanation: If transaction Ti gets an explicit lock on the file Fc in exclusive mode, then it has an implicit lock in exclusive mode on all the records belonging to that file.

Solution-32

Answer: a
Explanation: Concurrency is a property of systems in which several computations are executing simultaneously, and potentially interacting with each other.

Solution-33

Answer: c
Explanation: A distributed lock manager (DLM) provides distributed software applications with a means to synchronize their accesses to shared resources.

Solution-34

Answer: d
Explanation: Two-phase lock is a procedure for acquiring the necessary locks for a transaction where all necessary locks are acquired before any are released.

Solution-35

Answer: c

Explanation: When one data item is waiting for another data item in a transaction then system is in deadlock.

Solution-36

Answer: c

Explanation: The wound–wait scheme is a preemptive technique. It is a counterpart to the wait–die scheme.

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Solution-37

Answer: d
Explanation: We should roll back those transactions that will incur the minimum cost.

Solution-38

Answer: b
Explanation: There is an intention mode associated with shared mode, and there is one with an exclusive mode.

Solution-39

Answer(c)

X foreign key references to Y if "X" deleted then "Y" need not deleted.

Solution-40

Answer (d)

Both the given statements are true.

S_1: Participation of the weak entity set in identifying relationship should be total because primary key of weak entity set gets defined only by relating it to strong entity and its primary key value.

S2: Multivalued attributes in E-R diagram require separate tables along with key attribute when converted into relational model.

Solution-41

Answer(c)

Query Finds students who are enrolled in atleast one course offered by CS department and not enrolled in any course offered by ME departme

Solution-42

Answer(d)

Aabove query can be rewritten like this SELECT pname WHERE NOT NOT (budget > ALL (SELECT

FROM proj

budget

FROM project

WHERE city = 'KANPUR'))

Solution-43

. Answer(b)

Subquery finds budget of projects located in DELHI if that project has a larger budget than what is found in outer query not exist says subquery to return an empty result. In that case projects found in the outer relation have budgets greater than all projects located in DELHI

Solution-44

Answer(234516)

Take all tables listed in 2 compute their cross product Select rows of cross product that satisfy

the condition in 3

Group the selected rows by attribute in 4 Select the groups that satisfy the condition in 5

Project out the selected group attribute in 1 Last the result by attribute in 6

Solution-45

(a)

Query (b) is not correct. Correct form of query (b) is

```
Select name from emp
where sal > = ALL (select sal from emp)
```

Solution-46

Answer(d)

Query (A): When use 'IN' the inner query must retrieve only a single attribute.

Query (B): Between cannot be used with a sub-

query.

Query (C): In select clause only grouping attributes and aggregate functions are allowed, when using group by

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Solution-47

Answer(b)

If the book were organized as a heap file in a linear search so worst case bound is 500. By using binary search the worst case bound is $[\log_2 500]=9$ using the fact that the book is ordered by names with an index for the name of the first entry on each page we get worst case bound is 2 because the index has 500 pages, so entire index files in one page 1 access to the index and 1 to the data.

Solution-48

Answer(b)

One level B+ tree node will have 512 index entries which could only refer to 512 pages. A 2 level B ^ - tree have 512 * 512 index entries at the leaf level. There are 262, 144 entire. This is enough to address the 1000 pages of file. More over sufficient to address each record individually. Since there are only 100000 records.

Solution-49

Answer(b)

Internal node in B+ contains tree pointer and search key. $(P + 1) * 7 + P * 9 <= 512$

$7P + 7 + 9P <= 512$ $P \leq 31.5$

$16P <= 50$ ^ F

order (P) = 31

Solution-50

Answer(d)

The possible orders:

T1 -> T2 -> T3 -> T4

$T_1 \longrightarrow$ T3 $\longrightarrow$ T4 $\longrightarrow$ T2

T1-> T3 -> T2 -> T4

T1 -> T2 -> T4 -> T3 is not possible, T4-> T3 is not serializable.

So option (d) is correct.

Solution-51

Answer (a)

Schedule is recoverable, because there is no dirty read. If there exist a dirty read (W-R), then commit after parent of dirty read. i.e., if T2 reads after T1 writes over same data item x then T2 should commit after T1 commits. Schedule is conflict serializable [not forms a cycle]

Solution-52

Answer(b)

Recoverable but not cascadesless. For cascadeless T1 should read the value of x only after commit operation of T2 . Recoverable because T2commits first.

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Solution-53

Answer(c)

(a) Recoverable:

R1(A) W2(B) R1(B) C_2, C_1; [4]

(b) Casecadeless:

W1(A) . W2(A) ,C2 ,W1(A) , C1; [2]

(c) Strict:

R1(A) W2(B) , C2, R1(B) , W1(B) , C1; [3]

(d) Non recoverable:

R1(A) W2(B) R1(B) , C1 ,C2; [1]

Note: Strict schedule is recoverable and casecadeless schedule.
Casecadeless schedule is always recoverable

Solution-54

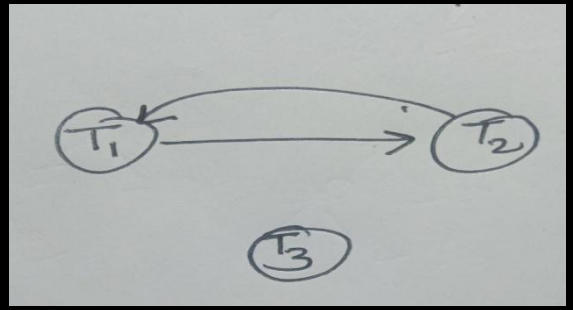
Answer(0)

Blind-write: Write operation on a data item without having a read operation on the same data item before.

The following are 5 blind-writes: $W_1(A)$ W2(A), W1(D) , W2(D) W3(E)

X = 5 The precedency graph for above schedule S1 is

shown below

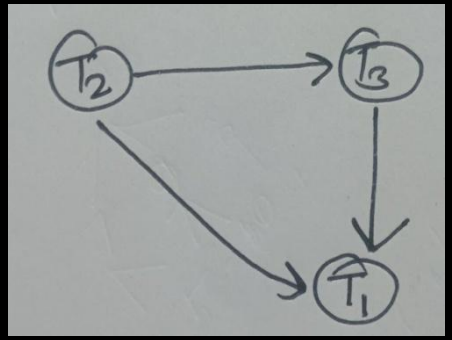


Since cycle exist in the graph, the number of conflict serializable schedules are zero i.e. Y = 0 .

X* Y = 0 .

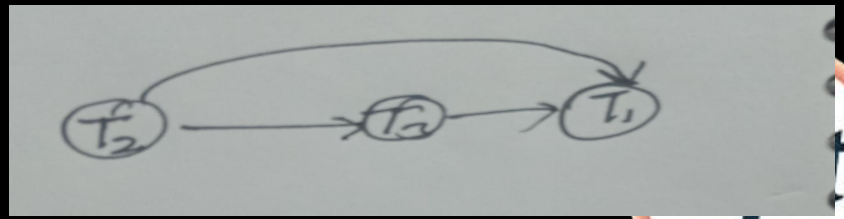
Solution-55

S_1: r1(X) ;r3(Y); r3(X); r2(Y); r2(Z); w3(Y) w2(Z) r1(Z) w1(X); w1(Z)



No cycle S1 is conflict serializable.

S_2:r1(X); r3(Y); r2(Y); r3(X); w2(Z) r1(Z); r 2(Z) w3(Y) w1(X); w1(Z)



No cycle S_2 is conflict serializable.

Solution-56

Answer d

After unlock over A, it locks again on A. Hence it is not in 2PL.

not conflict serializable.

Solution-57

Answer (b)

S, S, IS can held with shared [1]

- IX, IS, IS can held with IX[2]
- IX and Xare incompatible, so not possible [4]
- SIX, IS can held with SIX [3]

Solution-58

Answer(b)

No unlock operation can precede a lock operation in the same transaction.

Solution-59

Answer a

In wait-die scheme, when transaction Ti requests a data item currently held by Tj T1, is allowed to wait only if it has a timestamp smaller than that of Tj, Thus when T1 requests a data item held by Tj then T1 will wait.

Solution-60

Answer (d)

In wound-wait scheme, when transaction Ti requests a data item currently held by Tj then T1 is rolled back if timestamp of Tj, is larger than Ti Thus for the given question, data item will be preempted from T2 and T2 will be rolled back.

Solution-61

Answer c

Wait-die is a non-preemptive technique. Wound- wait is a preemptive technique. Wait-die and Wound-wait are the schemes for deadlock prevention. Both the schemes avoid starvation.

Solution-62

Answer (c)

Transaction T1 is waiting for data itemx, which is held by T2 And Transaction T2 is waiting for data item y, which is held by T1. Both transactions need Exclusive locks so the situation is in deadlock state.

Solution-63

Answer(b)

According to 2PL, if lock conversion is allowed, then upgrading of locks must be done during expansion phase, and degrading of locks must be done in the shrinking phase. .. S2 is true.

Lock upgradation is not allowed in shrinking phase therefore S_{1} is False

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.

Solution-64

Answer(d)

For this relation, only following FDs are of consideration

1. Date of Birth → Age 2. Name→ Roll_number

3. Roll_number → Name Keys of relation are (name, Date of Birth) and (Roll_number, Date of Birth). The relation is not in 2NF because of partial dependency i.e. Date of Birth→ Age. The other two FDs are not partial because their right hand side attributes are prime attributes

Solution-65

Answer(b)

YZ⟶ X is true because YZ is not repeating anywhere. If YZ repeats then X has to be repeated. Z⟶ Y is false because in first tuple when value of Z is 2, then value of Y is 4, but in last tuple value of Y has to be 4 but it is 2. Similarly is the care with 2nd and 3rd tuple.

Download ExamPrepTool (EPT App)

https://play.google.com/store/apps/details?id=com.ept.requestteacher

For PYQ's with video solutions, Topper Notes, short notes, Toppers Test Series

Note: If any doubt in any question post with subject & question number in EPT App.