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Course Code: MCA-108   Course Name: Database Management Systems
Class Test 2
Time: 1 Hour   Max Marks: 20

All questions carry half (0.5) mark each:

Q1.   A ……………… allows to make copies of the database periodically to help in the cases of crashes & disasters.

1. Recovery utility
2. Backup Utility
3. Monitoring utility
4. Data loading utility

Q2.   Which normal form is considered adequate for relational database design?

1. 2 NF
2. 3 NF
3. 4 NF
4. BCNF

Q3.   W hich of the following is true about SQL joins?

1. The join condition is not separated from other search conditions in a query.
2. The ON clause makes code difficult to understand.
3. The join condition for natural join is basically an equijoin of all columns with same name.
4. None of the above.

Q4.   Consider the following schema −

STUDENTS(student_code, first_name, last_name, email,
       phone_no, date_of_birth, honours_subject, percentage_of_marks);

Which of the following query would display the distinct honours subjects in the STUDENTS table?

1. select honours_subject from students;
2. select distinct honours_subject from students;
3. select all honours_subject from students;
4. select * from students;

Q5. Form of dependency in which set of attributes that are neither a subset of any of keys nor candidate key is classified as

1. transitive dependency
2. full functional dependency
3. partial dependency
4. prime functional dependency

Q6. If every functional dependency in set E is also in closure of F then this is classified as

1. FD is covered by E
2. E is covered by F
3. F is covered by E
4. F plus is covered by E

Q7. Consider the following schema –

STUDENTS(student_code, first_name, last_name, email, phone_no, date_of_birth, honours_subject, percentage_of_marks);

Which of the following query would display the full name of a student, with a column heading "Name"

1. select first_name, last_name as "Name" from students;
2. select Name from students;
3. select first_name || last_name as "Name" from students;
4. select first_name, last_name from students;

Q8. If there is more than one key for relation schema in DBMS then each key in relation schema is classified as

1. prime key
2. super key
3. candidate key
4. primary key

Q9. Property of normalization of relations which guarantees that functional dependencies are represented in separate relations after decomposition is classified as

1. nonadditive join property
2. independency reservation property
3. dependency preservation property
4. additive join property

Q10. Rule which states that addition of same attributes to right side and left side will results in other valid dependency is classified as

1. referential rule
2. inferential rule
3. augmentation rule
4. reflexive rule

Q11. Considering relational database, functional dependency between two attributes A and B is denoted by

1. $A \rightarrow B$
2. $B \leftarrow A$
3. $AB \rightarrow R$
4. $R \leftarrow AB$

Q12. If attribute of relation schema R is member of some candidate key then this type of attributes are classified as

1. atomic attribute
2. candidate attribute
3. nonprime attribute
4. prime attribute

Q13. In reflexive rule (IR1), true dependencies generated are classified as

1. trivial
2. nontrivial
3. inferential
4. functional

Q14. Considering functional dependency, one in which removal of some attributes does not affect dependency is called

1. full functional dependency
2. partial dependency
3. prime functional dependency
4. transitive dependency

Q15. Joining property which guarantees that spurious tuple generation problem is not

created after decomposition is called

1. lossless join property
2. nonadditive join property
3. additive join property
4. both a and b

Q16. Concept in normalization of relations which is based on full functional dependency is classified as

1. fourth normal form
2. third normal form
3. first normal form
4. second normal form

Q17. Rule which states that set of attributes determines any of its subset is classified as

1. closure rule
2. reflexive rule
3. referential rule
4. inferential rule

Q18. Tuples that are represented in one of two relations and are lost if JOIN operation is performed are called

1. functional tuples
2. dangling tuples
3. algorithm tuples
4. decomposition tuples

Q19. Other name of project-join normal form is

1. join normal form
2. trivial normal form
3. sixth normal form
4. fifth normal form

Q20. Decomposition of one relation say R into two relations is classified as

1. functional decomposition
2. ternary decomposition
3. binary decomposition
4. ordinary decomposition

Q21. Which of the following concurrency control protocols ensure both conflict

serialzability and freedom from deadlock? I. 2-phase locking II. Time-stamp ordering.

1. I only
2. II only
3. Both I and II
4. None

Q22. Consider the following four schedules due to three transactions (indicated by the subscript) using read and write on a data item x, denoted by r(x) and w(x) respectively. Which one of them is conflict serializable.

(A) $r_1(x)$; $r_2(x)$; $w_1(x)$; $r_3(x)$; $w_2(x)$

(B) $r_2(x)$; $r_1(x)$; $w_2(x)$; $r_3(x)$; $w_1(x)$

(C) $r_3(x)$; $r_2(x)$; $r_1(x)$; $w_2(x)$; $w_1(x)$

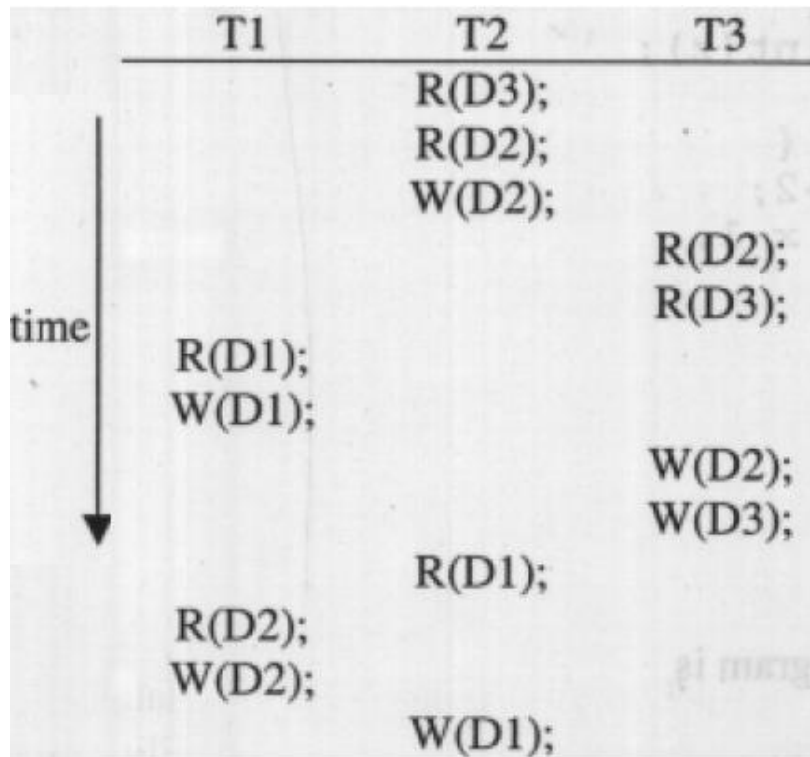(D) $r_2(x)$; $w_2(x)$; $r_3(x)$; $r_1(x)$; $w_1(x)$

1. A
2. B
3. C
4. D

Q23. Consider the following schedule S of transactions T1, T2, T3, T4:

T1	T2	T3	T4
	Reads(X)		
		Writes(X) Commit	
Writes(X) Commit			
	Writes(Y) Reads(Z) Commit		
			Reads(X) Reads(Y) Commit

Which one of the following statements is CORRECT?

1. S is not conflict-serializable but is recoverable
2. S is both conflict-serializable and recoverable
3. S is neither conflict-serializable nor is it recoverable
4. S is conflict-serializable but not recoverable

Q24. Consider three data items D1, D2 and D3 and the following execution schedule of transactions T1, T2 and T3. In the diagram, R(D) and W(D) denote the actions reading and writing the data item D respectively.

T1	T2	T3
	R(D3);	
	R(D2);	
	W(D2);	
		R(D2);
		R(D3);
R(D1);		
W(D1);		
		W(D2);
		W(D3);
	R(D1);	
R(D2);		
W(D2);		
	W(D1);	

time

Which of the following statements is correct?

1. The schedule is serializable as T2,T3,T1
2. The schedule is serializable as T2,T1,T3
3. The schedule is serializable as T3,T2,T1
4. The schedule is non-serializable.

Q25. **Consider the following transactions with data items P and Q initialized to zero:**
T1: read (P) ;
    read (Q) ;
    if P = 0 then Q : = Q + 1 ;
    write (Q) ;
T2: read (Q) ;
    read (P) ;

if Q = 0 then P : = P + 1 ;
write (P) ;

Any non-serial interleaving of T1 and T2 for concurrent execution leads to

1. A serializable schedule
2. A schedule that is not conflict serializable
3. A conflict serializable schedule
4. A schedule for which a precedence graph can not be drawn.

Q26. Which level of locking provides the highest degree of concurrency in a relational data base?

1. Page
2. Table
3. Row
4. Page, table and row level locking allow the same degree of concurrency

Q27. Which one of the following is NOT a part of the ACID properties of database transactions?

1. Atomicity
2. Consistency
3. Isolation
4. Deadlock-freedom

Q28. Suppose a database schedule S involves transactions T1, ...Tn. Construct the precedence graph of S with vertices representing the transactions and edges representing the conflicts. If S is serializable, which one of the following orderings of the vertices of the precedence graph is guaranteed to yield a serial schedule?

1. Topological order
2. Depth-first order
3. Breadth-first order
4. Ascending order of transactions

Q29. Consider the following database schedule with two transactions, T1 and T2.
S = r2(X); r1(X); r2(Y); w1(X); r1(Y); w2(X); a1; a2;

where ri(Z) denotes a read operation by transaction Ti on a variable Z, wi(Z) denotes a write operation by Ti on a variable Z and ai denotes an abort by transaction Ti . Which one of the following statements about the above schedule is TRUE?

1. S is non-recoverable
2. S is recoverable, but has a cascading abort

3. S is strict
4. S does not have a cascading abort

Q30. Which of the following statement is/are incorrect?

    a. A schedule following strict two phase locking protocol is conflict serializable as well as recoverable.
    b. Checkpoint in schedules are inserted to ensure recoverability.
1. Only a
2. Only b
3. Both a and b
4. none

Q31. Consider the following four schedules due to three transactions (indicated by the subscript) using read and write on a data item X, denoted by r(X) and w(X) respectively. Which one of them is conflict serializable ?
S1: r1(X); r2(X); w1(X); r3(X); w2(X)

S2: r2(X); r1(X); w2(X); r3(X); w1(X)

S3: r3(X); r2(X); r1(X); w2(X); w1(X)

S4: r2(X); w2(X); r3(X); r1(X); w1(X)

1. S1
2. S2
3. S3
4. S4

Q32. Consider the table R with attributes A, B and C. The functional dependencies that hold on R are : A → B, C → AB. Which of the following statements is/are True ? I. The decomposition of R into R_1(C, A) and R_2(A, B) is lossless. II. The decomposition of R into R_1(A, B) and R_2(B, C) is lossy.

1. Only I
2. Only II
3. Both I and II
4. none

Q33. A transaction can proceed only after the concurrency control manager _____ the lock to the transaction

1. Grants
2. Requests

3. Allocates
4. None of the mentioned

Q34. The situation where no transaction can proceed with normal execution is known as _____

    1. Road block
    2. Deadlock
    3. Execution halt
    4. Abortion

Q35. If a transaction has obtained a _____ lock, it can read but cannot write on the item

    1. Shared mode
    2. Exclusive mode
    3. Read only mode
    4. Write only mode

Q36. If a transaction Ti may never make progress, then the transaction is said to be _____

    1. Deadlocked
    2. Starved
    3. Committed
    4. Rolled back

Q37. The two phase locking protocol consists which of the following phases?

    1. Growing phase
    2. Shrinking phase
    3. More than one of the mentioned
    4. None of the mentioned

Q38. A protocol that ensures system will never enter a deadlock state is called

    1. Deadlock detection
    2. Deadlock elimination
    3. Deadlock prevention
    4. Deadlock recovery

Q39. An approach named Lock timeouts is used for

    1. Deadlock detection
    2. Deadlock elimination
    3. Deadlock recovery

4. Deadlock prevention

Q40. A scheme that creates a new version of a data item for each transaction is defined by

    1. Concurrency control scheme
    2. Multiversion concurrency control scheme
    3. Timestamp concurrency control scheme
    4. Wound concurrency control scheme