

RDBMS QUIZ-4

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* Required

1. Student Reg number *

2. Student name *

3. Semester *

4. Section *

5. 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 Point)

- ☐ A serializable schedule
- ☒ A schedule that is not conflict serializable
- ☐ A conflict serializable schedule
- ☐ A schedule for which a precedence graph cannot be drawn

6. 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 $r_i(Z)$ denotes a read operation by transaction T_i on a variable Z , $w_i(Z)$ denotes a write operation by T_i on a variable Z and a_i denotes an abort by transaction T_i . Which one of the following statements about the above schedule is TRUE?

*

(1 Point)

- ☐ S is non-recoverable
- ☐ S is recoverable, but has a cascading abort
- ☒ S does not have a cascading abort
- ☐ S is strict

7. Consider the following transaction involving two bank accounts x and y. *

(1 Point)

- ☐ Atomicity
- ☐ Isolation
- ☐ Durability
- ☒ consistency

8. Consider the table R with attributes A, B and C. The functional dependencies that hold on R are : $A \rightarrow B$, $C \rightarrow AB$. Which of the following statements is/are True ?

- I. The decomposition of R into R1(C, A) and R2(A, B) is lossless.
- II. The decomposition of R into R1(A, B) and R2(B, C) is lossy.

*

(1 Point)

- ☒ I and II
- ☐ I only
- ☐ II only
- ☐ None of the above

9. Consider a simple checkpointing protocol and the following set of operations in the log.

(start, T4); (write, T4, y, 2, 3); (start, T1); (commit, T4); (write, T1, z, 5, 7); (checkpoint); (start, T2); (write, T2, x, 1, 9); (commit, T2); (start, T3); (write, T3, z, 7, 2);

If a crash happens now and the system tries to recover using both undo and redo operations, what are the contents of the undo list and the redo list

*

(1 Point)

- ☒ Undo: T3, T1; Redo: T2
- ☐ Undo: T3, T1; Redo: T2, T4
- ☐ Undo: none; Redo: T2, T4, T3; T1
- ☐ Undo: T3, T1, T4; Redo: T2

10. _____ rollback requires the system to maintain additional information about the state of all the running transactions.

*

(1 Point)

- ☐ total
- ☒ partial
- ☐ time
- ☐ commit

11. Let S be the following schedule of operations of three transactions T1, T2 and T3 in a relational database system: R2(Y), R1(X), R3(Z), R1(Y)W1(X), R2(Z), W2(Y), R3(X), W3(Z) Consider the statements P and Q below:

- **P:** S is conflict-serializable.
- **Q:** If T3 commits before T1 finishes, then S is recoverable.

Which one of the following choices is correct?

*

(1 Point)

- ☐ Both P and Q are true
- ☒ P is true and Q is false
- ☐ P is false and Q is true
- ☐ Both P and Q are false

12. If a transaction has obtained a _____ lock, it can both read and write on the item *

(1 Point)

- ☐ Shared mode
- ☒ Exclusive mode
- ☐ Read only mode
- ☐ Write only mode

13. Consider the following two phase locking protocol. Suppose a transaction T accesses (for read or write operations), a certain set of objects {O1,...,Ok}. This is done in the following manner: **Step 1.** T acquires exclusive locks to O1, . . . , Ok in increasing order of their addresses. **Step 2.** The required operations are performed. **Step 3.** All locks are released. This protocol will

* 

(1 Point)

- ☒ guarantee serializability and deadlock-freedom
- ☐ guarantee neither serializability nor deadlock-freedom
- ☐ guarantee serializability but not deadlock-freedom
- ☐ guarantee deadlock-freedom but not serializability

14.

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

*

(1 Point)

- ☐ wait-die
- ☐ wait wound
- ☒ wound waitwait
- ☐ Option 4

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