

[Home](#) > [DBMS](#) > [Transaction](#) > [Serializability of Schedules](#) > [Conflict Serializable](#)**Question**[Download Solution PDF](#)

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 ?

$S_1 : r_1(X); r_2(X); w_1(X); r_3(X); w_2(X)$

$S_2 : r_2(X); r_1(X); w_2(X); r_3(X); w_1(X)$

$S_3 : r_3(X); r_2(X); r_1(X); w_2(X); w_1(X)$

$S_4 : r_2(X); w_2(X); r_3(X); r_1(X); w_1(X)$

This question was previously asked in

UGC NET Computer Science (Paper 3) Nov 2017 Official Paper

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1.  $S_1$
2.  $S_2$
3.  $S_3$
4.  $S_4$

**Answer** (Detailed Solution Below)

Option 4 :  $S_4$

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### Detailed Solution

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#### CONCEPT

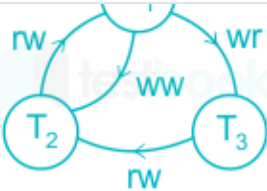
A schedule is called conflict serializable if it can be transformed into a serial schedule by swapping non-conflicting operations.

For a schedule to be conflict serializable, there should be no cycle present in its precedence graph.

#### EXPLANATION:

Option\_1 – Not conflict serializable

$T_1$	$T_2$	$T_3$
$r(X)$		
	$r(X)$	
$w(X)$		
		$r(X)$
	$w(X)$	



- Cycle between T1 and T2.
- Cycle between T1->T3->T2

Option\_2 – Not conflict serializable

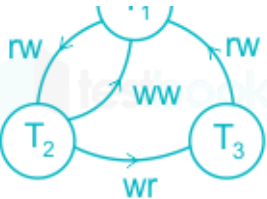
T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
	r(X)	
r(X)		
	w(X)	
		r(X)
w(X)		

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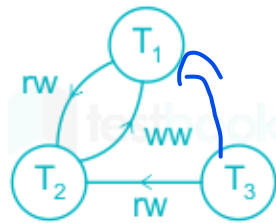


- Cycle between T1 and T2.
- Cycle between T1->T2->T3

Option-3 - Not conflict serializable

T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
		r(X)

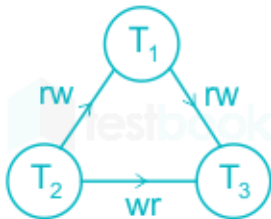
r(X)		
	w(X)	
w(X)		



- Cycle between T1 and T2.

Option-4 - Conflict serializable

T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>
	r(X)	
	w(X)	
		r(X)
r(X)		
w(X)		



- No cycle

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Q1.Consider the following statements: Statement I: Conservative 2 PL is a deadlock-free protocol. Statement II: Thomas's write rule enforces conflict serializability. Statement III: Timestamp ordering protocol ensures serializability based on the order of transaction timestamps. Which of the following is correct? [➤](#)

Q3.Consider the following transaction 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

Q4.A schedule in which each transaction is executed atomically is called a \_\_\_\_\_ .

Q5.Consider the following schedule for transactions T1, T2 and T3: T1 T2 T3 Read(X) Read (Y) Read (Y) Write (Y) Write (X) Write (X) Read (X) Write (X) Which one of the schedules below is the correct serialization of the above?

Q6.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

Q7.Suppose a database schedule S involves transactions T1, T2, .....Tn Consider 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 ?

Q8.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)

Q9.Let  $r_i(z)$  and  $w_i(z)$  denote read and write operations respectively on a data item z by a transaction  $T_i$ . Consider the following two schedules. S1 :  $r_1(x)$   $r_1(y)$   $r_2(x)$   $r_2(y)$   $w_2(y)$   $w_1(x)$  S2 :  $r_1(x)$   $r_2(x)$   $r_2(y)$   $w_2(y)$   $r_1(y)$   $w_1(x)$  Which one of the following options is correct?

Q10.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?

## More Transaction Questions

Q1.Which one of the following statements are CORRECT? (A) Granularity is the size of data item in a database. (B) Two operations in a schedule are said to be conflict if they belong to same transaction. (C) Two schedulers are said to be conflict equivalent if the order of any two conflicting operations is the same in both schedules. (D) Write operations which are performed without performing the write operation are known as Blind Writes. Choose the correct answer from the options given below:

Q2.Which one of the following is NOT a part of ACID properties of a database transaction?

Thomas's write rule enforces conflict serializability. Statement III: Timestamp ordering protocol ensures serializability based on the order of transaction timestamps. Which of the following is correct? >

Q5.Which of the following is not a proper state of transaction? >

Q6.Which of the DBMS component ensures that concurrent execution of multiple operations on the database results into a consistent database state? >

Q7.A transaction may be in one of the following states during its execution life cycle in concurrent execution environment. A. FAILED B. TERMINATED C. PARTIALLY COMMITTED D. COMMITTED E. ACTIVE Given a transaction in active state during its execution, find its next transitioned state from the options given below : >

Q8.Let  $R_i(z)$  and  $W_i(z)$  denote read and write operations on a data element  $z$  by a transaction  $T_i$ , respectively. Consider the schedule  $S$  with four transactions.  $S: R_4(x)R_2(x)R_3(x)R_1(y)W_1(y)W_2(x)W_3(y)R_4(y)$  Which one of the following serial schedules is conflict equivalent to  $S$ ? >

Q9.In DBMS, isolation property is also called as \_\_\_\_\_. >

Q10.To ensure integrity of the data, a database system should follow the ACID properties. What are these ACID properties? >



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### More DBMS Questions

Q1.Which of the following is/are NOT CORRECT statement? (A) The first record in each block of the data file is known as actor record. (B) Dense index has index entries for every search key value in the data file. (C) Searching is harder in the B+ tree than B- tree as the all external nodes linked to each other. (D) In extendible hashing the size of directory is just an array of  $2d-1$ , where  $d$  is global depth. Choose the correct answer from the options given below: >

Q2.Which one of the following statements are CORRECT? (A) Granularity is the size of data item in a database. (B) Two operations in a schedule are said to be conflict if they belong to same transaction. (C) Two schedulers are said to be conflict equivalent if the order of any two conflicting operations is the same in both schedules. (D) Write operations which are performed without performing the write operation are known as Blind Writes. Choose the correct answer from the options given below: >

Q3."CREATE TABLE T" in SQL is an example of : >

Q4.Match List-I with List-II List I List II A. BCNF iff I. every JD is implied by the candidate keys B. 5 NF iff II. all underlying domains contain scalar values only C. 1 NF iff III. every MVD is implied by the candidate keys D. 4 NF iff IV. every FD is implied by the candidate keys Choose the correct answer from the options given below : >

Q5.Which part of database holds only one type of information? >

Q6.Choose the correct meaning of SQL statement: Select \* from r4r\_emp; >

Q7.In a DBMS, you can >

Q8.Which one of the following is NOT a part of ACID properties of a database transaction? >

Q9.Given the basic E R diagram and relational model, which of the the following is incorrect? >

Q10.A B-tree used as an index for a large database table has four levels including the root node. If a new key is inserted in this index, then maximum number of nodes that could be newly created in the process is >



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