QUESTIONS ON SERIALIZABILITY IN TRANSACTION

Testing Conflict and View Serializability

To test whether a schedule is conflict-serializable, you can use the precedence graph (or conflict graph). The process involves the following steps:

- Step 1.

  Identify Conflicting Operations: Conflicts occur when two transactions access the same data item, and at least one of them is a write operation. Common conflicts are:

  - Write-Read (WR): A transaction writes a data item, and another transaction reads it.
  - Read-Write (RW): A transaction reads a data item, and another transaction writes to it.
  - Write-Write (WW): Two transactions write to the same data item.

- Step 2.

  Construct the Precedence Graph:

  - Create a node for each transaction in the schedule.
  - Draw a directed edge from transaction Ti to transaction Tj if Ti performs a conflicting operation before Tj.

- Step 3.

  Check for Cycles:

  - If the precedence graph has no cycles, the schedule is conflict-serializable.
  - If there are cycles, the schedule is not conflict-serializable.

Q.1

You are given a schedule as below. Check whether schedule is conflict serializable or not schedule S:
S: r1(x) r1(y) w2(x) w1(x) r2(y)

Q.2 Consider another schedule S1:

S1: r1(x) r3(y) w1(x) w2(y) r3(x) w2(x)

Q.3 Check whether the given schedule S is conflict serializable or not-

S : $R_1(A)$, $R_2(A)$, $R_1(B)$, $R_2(B)$, $R_3(B)$, $W_1(A)$, $W_2(B)$

Q4. Check whether the given schedule S is conflict serializable and recoverable or not-

T1	T2	T3	T4
	R(X)		
		W(X)	
		Commit	
W(X)			
Commit			
	W(Y)		
	R(Z)		
	Commit		
			R(X)
			R(Y)
			Commit

Q5. Check whether the given schedule S is conflict serializable or not.

T1	T2	T3	T4
			R(A)
	R(A)		
		R(A)	
W(B)			
	W(A)		
		R(B)	
	W(B)		

Q 6. Given schedule S, check whether the given schedule S is conflict serializable or not.

T1	T2
R(A)	
	R(A)
	W(A)
	R(B)
W(A)	
R(B)	
W(B)	
	W(B)

Q.7 Check given schedule S1 & S2 is view Serializable or not
S1: R1(A),W1(A),R2(A),W2(A),R1(B),W1(B),R2(B),W2(B)
S2:R1(A),W1(A),R1(B),W1(B),R2(A),W2(A),R2(B),W2(B)

Q.8 Check whether schedule is view equivalent or not?

T1	T2	T3
Read(A) Write(A)	Write(A)	Write(A)

Schedule S

T1	T2	T3
Read(A) Write(A)	Write(A)	Write(A)

Schedule S1

Q.9 Check given schedule S1 & S3 is view Serializable or not
S1: R1(A), W1(A), R2(A), W2(A), R1(B), W1(B), R2(B), W2(B)
S3: R2(A), W2(A), R2(B), W2(B), R1(A), W1(A), R1(B), W1(B),

Q.10 Check given schedule S is Conflict Serializable or not
S2: r1(x), r2(x), r2(y), w2(y), r1(y), w1(x)

Q.11 Check given schedule S is Conflict Serializable or not
S1: r1(x), r1(y), r2(x), r2(y), w2(y), w1(x)