Question 1

Consider the three transactions T1, T2and T3, and the schedules S1, S2, S3 and S4 given below. Which ofthe schedules is conflictserializable? The subscript for each database operation in a schedule denotes thetransaction number for that operation. For each schedule, show all conflicts, draw the precedence graph,determine and write down if it is serializable or not, and the equivalent serial schedules if exist

Transactions

T1: R1(X), W1(X)

T2: R2(X)

T3: R3(X) W3(X)

Schedules

S1: R1(X) R3(X) W1(X) R2(X) W3(X)

S2: R1(X) R3(X) W3(X) W1(X) R2(X)

S3: R3(X) R2(X) W3(X) R1(X) W1(X)

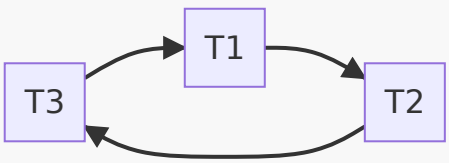
S4: R3(X) R2(X) R1(X) W3(X) W1(X)

Schedule 1

S1: R1(X) R3(X) W1(X) R2(X) W3(X)

T1	T2	T3
R1(X)		
		R3(X)
W1(X)		
	R2(X)	
		W3(X)

Schedule 1 Graph



S1 is not conflict serializable, cycle detected in graph

Schedule 2

S2: R1(X) R3(X) W3(X) W1(X) R2(X)

T1	T2	T3
R1(X)		
		R3(X)
		W3(X)
W1(X)		
	R2(X)	

Schedule 2 Graph

Schedule 2 is Conflict Serializable in the type T3->T1->T2

Schedule 2 Conflict Serialized: R3(X) W3(X) R1(X) W1(X) R2(X)

Schedule 3

S3: R3(X) R2(X) W3(X) R1(X) W1(X)

T1	T2	T3
		R3(X)
	R2(X)	
		W3(X)
R1(X)		
W1(X)		

Schedule 3 Graph

Schedule 3 is Conflict Serializable in the Type T2->T3->T1

Schedule 3 Conflict Serialized: R2(X) R3(X) W3(X) R1(X) W1(X)

Schedule 4

S4: R3(X) R2(X) R1(X) W3(X) W1(X)

T1	T2	T3
		R3(X)
	R2(X)	
R1(X)		
		W3(X)
W1(X)		

Schedule 4 Graph

Schedule 4 is NOT Conflict Serializable, Cycle detected on graph between T1 and T3