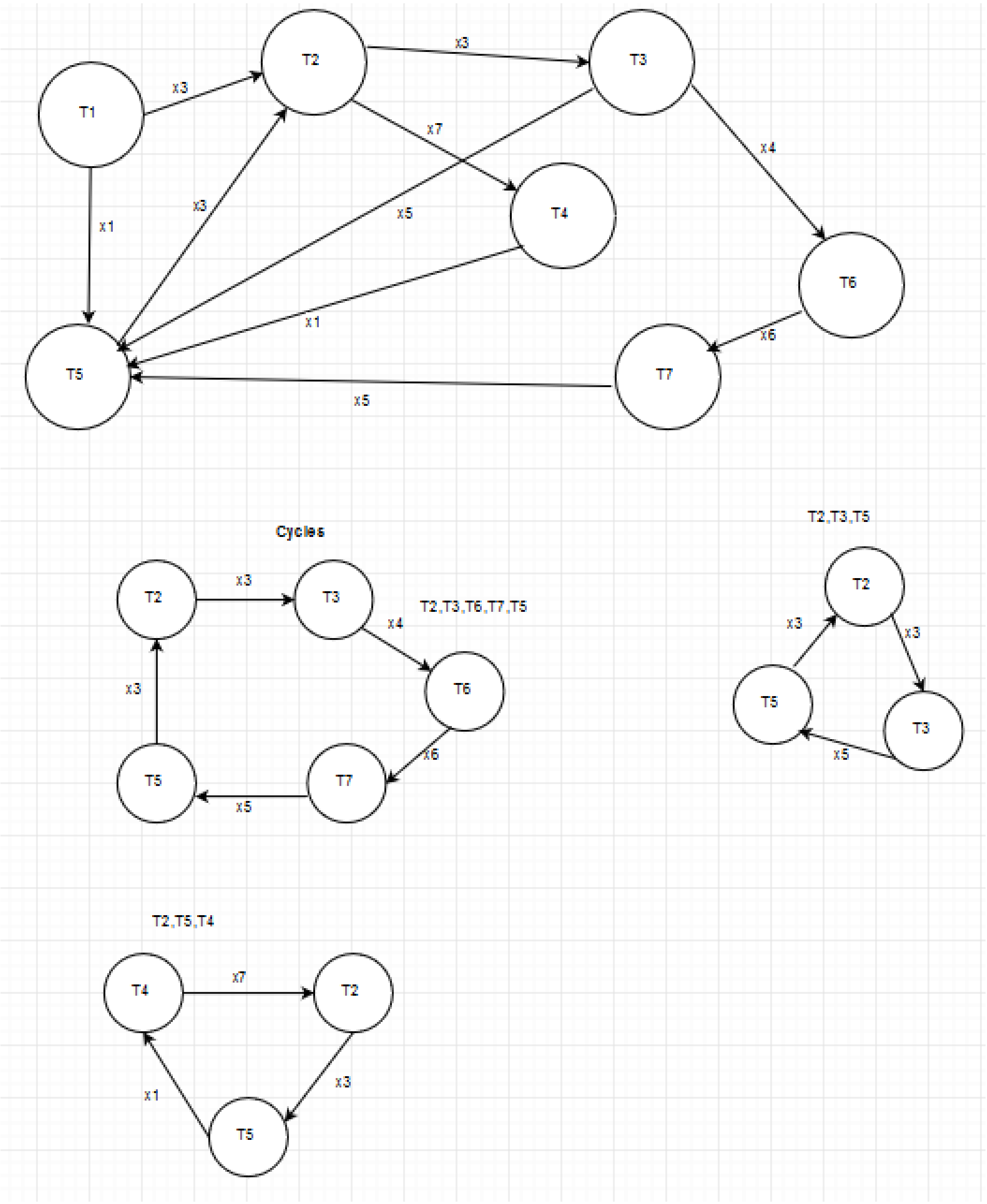
Lab 9

1. **[5] Produce a wait-for-graph for the following transaction scenario and determine whether deadlock exists.**

Transaction	**Data Items locked by Transaction**	**Data items transaction is waiting for**
T1	x2	x1, x3
T2	x3, x10	x7, x8
T3	x8	x4, x5
T4	x7	x1
T5	x1, x5	x3
T6	x4, x9	x6
T7	x6	x5

Ans:-



2. [5] Consider the following sequence of actions, listed in the order the actions are presented to the DBMS.

T1: R(X), T2: W(X), T2: W(Y), T3: W(Y), T1: W(Y), T3:R(Z), T3:W(Z), T1: Commit, T2: Commit, T3: Commit

Assume that the concurrency control mechanism is 2PL with "Wound-Wait" deadlock prevention strategy.
Acquire locks as late as possible and release locks as early as possible. Waiting

transactions continued and brought up to date as early as possible.
Describe how the concurrency control mechanism handles the sequence of actions.

Ans:-

- 2PL.
- Wound-Wait.
- Acquire locks as late as possible.
- Release locks as early as possible.
- waiting transactions continue and brought up to date as early as possible.

t1	T1 gets shared lock on X →T1: R(X)
t2	T2 wants write lock on X, but since T2 is younger than T1, T2 **waits** for T1
t3	T3 gets exclusive lock on Y →T3:W(Y)
t4	T1 wants write lock on Y, T3 has the lock and is younger than T1, T3 **abort**
t5	T1 commits & releases lock X and Y
t6	T2 acquires and gets the exclusive lock on X →T2:W(X)
t7	T2 gets the exclusive lock on Y →T2:W(Y)
t8	T2 commits & releases lock X and Y
t9	T3 restarts and gets exclusive lock on Y →T3:W(Y)
t10	T3 gets shared read lock on Z →T3:R(Z)
t11	T3 gets exclusive write lock on Z →T3:W(Z)
t12	T3 commits & releases lock Z