b1

Transaction 1 has begun and an entry has been created in the transaction table with state as Active and timestamp as 1.

r1(Y)

The transaction state for transaction 1 is Active so transaction 1 has acquired Read Lock on it and entry for data item Y has been created in the lock table

r1(Z)

The transaction state for transaction 1 is Active so transaction 1 has acquired Read Lock on it and entry for data item Z has been created in the lock table

b2

Transaction 2 has begun and an entry has been created in the transaction table with state as Active and timestamp as 2.

r2(Y)

Transaction 2 has also acquired Read Lock on Y and it is added to the read transaction id list for item Y in lock table.

b3 - Transaction 3 has begun and an entry has been created in the transaction table with state as Active and timestamp as 3.

r3(Y)

Transaction 3 has also acquired Read Lock on Y and it is added to the read transaction id list for item Y in lock table.

w1(Z)

The read lock on data item Z by Transaction ID 1 has been upgraded to Write Lock.

w3(Y) - Transaction 3 is in blocked state and write operation on dataitem Y has been added to the waiting operation queue of transaction table and the Transaction3 has been added to the waiting list queue of lock table.

w3(Y) - Transaction 3 has been blocked because timestamp of T3 > T1

w2(Y) - Transaction 2 is in blocked state and write operation on dataitem Y has been added to the waiting operation queue of transaction table and the Transaction2 has been added to the waiting list queue of lock table.

Releasing locks acquired by Transaction 3.

Transaction 3 has released read lock on Y

Aborting Transaction 3

r2(X)

Transaction 2 is in blocked state and Read operation on dataitem X has been added to the waiting operation queue of transaction table and the Transaction2 has been added to the waiting list queue of lock table.

e1

Transaction 2 state has been changed from Block to Active

Running its waiting operations

r2(X) - The transaction state for transaction 2 is Active so transaction 2 has acquired Read Lock on it and entry for data item X has been created in the lock table

Transaction 1 has released write lock on Z

Transaction 1 has been committed and locks have been released

e3

Transaction 3 cannot be committed because it has already been aborted.

w2(X) - The read lock on data item X by Transaction ID 2 has been upgraded to Write Lock.

e2

Transaction 2 has released read lock on Y

Transaction 3 state has been changed from Block to Active

Running its waiting operations

Transaction 2 has released write lock on X

Transaction 2 has been committed and locks have been released