

## Recovery Algorithm

Q1. System crash at (before) [write item T<sub>2</sub>, D, 25, 26]

	UNDO LIST	REDO LIST
[start T <sub>3</sub> ]		
[read T <sub>3</sub> , C]	T <sub>3</sub> , T <sub>2</sub> , T <sub>1</sub>	-
[write T <sub>3</sub> , B, 15, 12]		
[start T <sub>2</sub> ]		
[read T <sub>2</sub> , B]		
[write T <sub>2</sub> , B, 12, 18]		
[start T <sub>1</sub> ]		
[read T <sub>1</sub> , A]		
[read T <sub>1</sub> , D]		
[write T <sub>1</sub> , D, 20, 25]		
[read T <sub>2</sub> , D]		
— CRASH —		
[write T <sub>2</sub> , D, 25, 26]		
[read T <sub>3</sub> , A]		

∴ Additional log records for undoing T<sub>3</sub>, T<sub>2</sub> and T<sub>1</sub> are

<T<sub>1</sub>, D, 20>

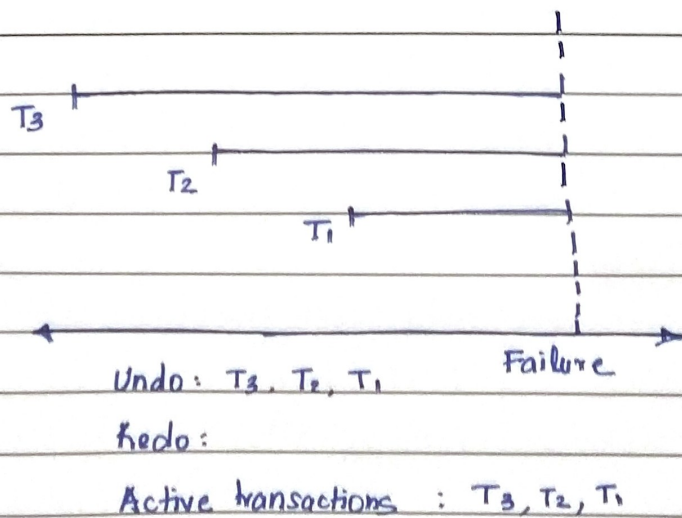
<T<sub>1</sub> abort>

<T<sub>2</sub>, B, 12>

<T<sub>2</sub> abort>

<T<sub>3</sub> abort>

### Diagram



## Final Log Record

< start  $T_3$  >

< read  $T_3, C$  >

< write  $T_3, B, 15, 12$  >

< start  $T_2$  >

< read  $T_2, B$  >

< write  $T_2, B, 12, 18$  >

< start  $T_1$  >

< read  $T_1, A$  >

< read  $T_1, D$  >

< write  $T_1, D, 20, 25$  >

< read  $T_2, D$  >

— CRASH —

<  $T_1, D, 20$  >

<  $T_1$ , abort >

<  $T_2, B, 12$  >

<  $T_2$  abort >

<  $T_3$  abort >





Q2

<start T<sub>1</sub>>

UNDO LIST

REDO LIST

<read T<sub>1</sub>, A><read T<sub>1</sub>, D>T<sub>2</sub>T<sub>4</sub><write T<sub>1</sub>, D, 20, 25>T<sub>4</sub><commit T<sub>1</sub>>T<sub>3</sub>

[checkpoint]

UNDO : T<sub>2</sub>, T<sub>3</sub><start T<sub>2</sub>>REDO : T<sub>4</sub><read T<sub>2</sub>, B>

∴ Additional log records  
will be added to undo  
T<sub>2</sub> & T<sub>3</sub> -

<write T<sub>2</sub>, B, 12, 18><start T<sub>4</sub>><read T<sub>4</sub>, D>

(Since T<sub>1</sub> is committed before checkpoint  
it will not be required to redone)

<write T<sub>4</sub>, D, 25, 15><start T<sub>3</sub>><write T<sub>3</sub>, C, 30, 40><T<sub>2</sub>, D, 15><read T<sub>4</sub>, A><T<sub>3</sub>, C, 30><write T<sub>4</sub>, A, 30, 20><T<sub>3</sub> abort><commit T<sub>4</sub>><T<sub>2</sub>, B, 12><read T<sub>2</sub>, D><T<sub>2</sub> abort><write T<sub>2</sub>, D, 15, 25>

- CRASH -

Diagram

Answer:

<T<sub>2</sub>, D, 15><T<sub>3</sub>, C, 30><T<sub>3</sub> abort><T<sub>2</sub>, B, 12><T<sub>2</sub> abort>