Sample solutions

Question 1.

There are 7 events, which we call
• A : Database element A is written to disk
• B : Database element B is written to disk
• C : Database element C is written to disk
• LA : The log record for A is written to disk
• LB : The log record for B is written to disk
• LC : The log record for C is written to disk
• CM : The commit record is written to disk

The undo rules imply the following constraints:
• CM must be last
• LA is before A
• LB is before B
• LC is before C
• LA is before LB
• LB is before LC

We assume that log records are written to disk in the order they appear. There are 15 possible schedules:
• LA LB LC A B C
• LA LB LC A C B
• LA LB LC B A C
• LA LB LC B C A
• LA LB LC C A B
• LA LB LC C B A
• LA LB A LC B C
• LA LB A LC C B
• LA LB A B LC C
• LA LB B LC A C
• LA LB B LC C A
• LA LB B A LC C
• LA A LB B LC C
• LA A LB LC B C
• LA A LB LC C B

Question 2.
For part (b): O – old value; N – new value

	Before recovery	After recovery
A	O/N	10
B	N	N
C	O/N	30
D	N	N
E	50	50

Question 3.
For part (b):

	Before recovery	After recovery
A	O	O
B	O/N	20
C	O	O
D	O/N	40
E	O	O

Question 4.

A.

	SAMPLE	**Answer I (Log I)**	**Answer II (Log II)**	**Answer III (Log III)**	**Answer IV (Log IV)**
IC1	**X, 0**	X, 10	Y, 0	Y, 0	
IC2	**T_1, 0**	T1, 0	T1, 20	T2, 20	
IC3	**0**	20	10	10	

B.

	X	**Y**
Log I	20/100	0,30,40
Log II	10/100	20/30/40
Log III	10/100	20/30/40
Log IV		