

1.
 - a. T
 - b. Q
 - c. Q,R,S
 - d. $y=0, z=12, x=10, w=0$
 - e. Transaction T needs to be redone
2.
 - a.
 - <Q starts>
 - <R starts>
 - <Q,w,20>
 - <R,x,5>
 - <Q aborts>
 - <R,y,0>
 - <R commits>
 - <S starts>
 - <checkpoint record>
 - <S,x,10>
 - <T starts>
 - <T,y,15>
 - <S commits>
 - system crash--
 - b. T
 - c. none
 - d. Q,R,S
 - e. $y=0, z=12, x=10, w=0$
 - f. Transaction T needs to be redone
3.
 - a. You would have to undo transaction S
 - b. none
4.
 - a. $a = 40, b = 100$
 - b. $a = 30, b = 100$
 - c. That the order of execution matters

5.

Transaction S	Transaction T
read(a)	
	read(a)
$a = a + 10$	
	$a = a * 2$
write(a)	
	write(a)
read(b)	
$b = b * 5$	
write(b)	

6.

Transaction S	Transaction T
<i>Growing Phase</i>	<i>Growing Phase</i>
request exclusive lock (a) - granted	
read(a)	
	request exclusive lock (a) - denied
	request exclusive lock (a) - denied
a = a + 10	
write(a)	
	request exclusive lock (a) - denied
request exclusive lock (b) - granted	
read(b)	
b = b * 5	
write(b)	
<i>Shrinking Phase</i>	
release lock (a)	
	request exclusive lock (a) - granted
	read(a)
	a = a * 2
release lock (b)	
	write(a)
	<i>Shrinking Phase</i>
	release lock (a)

The schedule can be executed and deadlock would not occur, it could occur if the schedule was slightly different but it would not in this specific instance.