Sample solutions

Question 1.
(A) (a)

T1	T2
l-S$_1$(A)	
	l-S$_2$(A)
l-X$_1$(A)	
	l-X$_2$(A)
--- Deadlock ---	

(b)

	S	X	U
S	T	F	T
X	F	F	F
U	F (T can lead to starvation)	F	F

Observe that matrix is NOT symmetric.

(B)

	R(x)	W(x)	C(x, ?)	C(?, x)
R(x)	T	F	T	F
W(x)	F	F	F	F
C(x, ?)	T	F	T	F
C(?, x)	F	F	F	F

Question 2

	S	X	I
S	T	F	F
X	F	F	F
I	F	F	I

If a transaction holds an I lock, then no other transactions can hold an S or X lock. However, many transactions can hold an I lock concurrently.
S is serializable and is equivalent to the serial schedule T3, T1, T2

Question 4

IS1, IS2, IX3 | IS4, IX4 |
R

IS2, S1
| IS3, S3 | P1

| IX3 | | IS1 |
| P2 | | IS2 |

S2
t1

X3
t4

t2

t3

t5

| | | S2 | | S2 | | | | S3 |