Sample Solution for Summer 2013

Question 1

(a)

The minimum possible number of input variables is 6, as any smaller number of input variables wouldn't have enough rows in the truth table (5 would have 2^5 = 32) to give terms to the CPOS, where each term corresponds to a row from the truth table.

(b)

Question 4

(a)

(see accompanying image in Drive – I need to figure out how to put pictures in these files)

(b)

z \ x	0	1
0	0	1
1	2	3
2	0	1
3	2	3

(c)

No, there is no such input sequence. If you start at state 3 (the only state which outputs 1), none of the states you can go to can return you to state 3 on the following step.

(d)

Yes. This sequence of input values will:

```
011101110111…
```

Note for the first state the output is undefined, so the output value sequence here will actually be this:

```
-10011001100…
```

If we want to have an extra 1 at the start, we just need to add an extra 0 or 1 to the start of our input sequence.