

Test 9

1. Consider the following state table:

q	q *		z
	x = 0	x = 1	
A	D	B	1
B	D	A	1
C	E	A	0
D	E	B	0
E	D	C	0

a) (20) For each of the following partitions, indicate whether or not it is SP and whether or not it is output consistent.

$$P_1 = (A B C) (D E)$$

$$P_2 = (A B) (C D E)$$

$$P_3 = (A C) (B D) (E)$$

$$P_4 = (A B) (C) (D) (E)$$

$$P_5 = (A D E) (B C)$$

$$P_6 = (A) (B) (C) (D) (E)$$

$$P_7 = (A E) (B) (C D)$$

$$P_8 = (A B C D E)$$

$$P_9 = (A) (B C) (D E)$$

$$P_{10} = (A B) (C D) (E)$$

b) (10) Using one of these partitions, reduce the system to the one with the smallest number of states, showing a new state table.

2. (30) For the following state table, find all of the non-trivial SP partitions.

q	q *		z
	x = 0	x = 1	
A	D	B	1
B	D	A	1
C	A	A	0
D	D	C	0

3. For the following state table (with two different output columns shown)

q	q *		z ₁	z ₂
	x = 0	x = 1		
A	B	E	0	1
B	A	E	1	0
C	A	D	0	1
D	C	E	1	1
E	C	D	1	0

The non-trivial SP partitions are:

$$P_1 = (A B) (C) (D) (E)$$

$$P_2 = (A B C) (D E)$$

$$P_3 = (A D E) (B C)$$

$$P_4 = (A) (B C) (D E)$$

$$P_5 = (A) (B) (C) (D E)$$

$$P_6 = (A B) (C) (D E)$$

a) (30) For output column z₁, reduce the system to one with a minimum number of states. Show the reduced state table and list all of the non-trivial SP partitions of the reduced system.

b) (10) For output column z₂, show a state assignment that will likely lead to a solution with a minimum amount of logic. Explain briefly how you chose it. (For example, I chose q₂ according to an SP partition)