

1994 Paper 12 Question 1

Digital Electronics and Computer Design

A sequential machine with two input wires and a single output has a behaviour specified in the following transition table:

Initial state	Input	Next state				Input	Output			
		00	01	10	11		00	01	10	11
a		c	b	a	a	0	0	0	1	
b		d	b	b	e	0	1	1	1	
c		e	d	e	a	0	0	0	1	
d		b	d	b	a	0	1	1	1	
e		a	d	c	c	0	0	0	1	

Demonstrate that this behaviour could be exhibited by a machine with fewer states. [12 marks]

Draw the state diagram for the reduced machine. [8 marks]