

1995 Paper 11 Question 12

Digital Electronics

A sequential circuit has been designed which behaves slightly erratically. When switched on it produces on its three output wires one of the following patterns:

| | | | | |
|-------|----|-------|----|-------|
| 000 | | 011 | | 110 |
| 001 ← | or | 111 ← | or | 101 ← |
| 100 | | 010 | | 110 |
| 111 | | 000 | | |
| 010 | | 001 | | |
| 000 | | 100 | | |

The last pattern was not intended to arise, although the other two are acceptable. Deduce a possible circuit which exhibits this behaviour. [12 marks]

Propose a modification to your circuit which eliminates the third pattern. [8 marks]