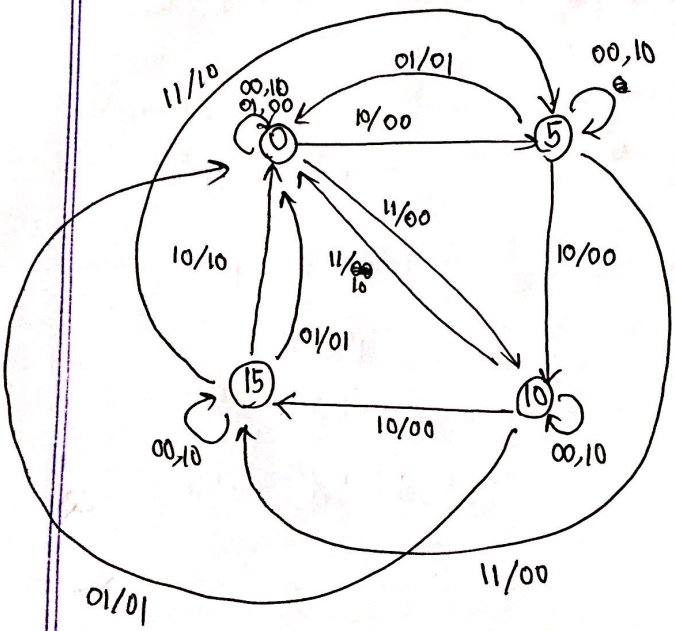
Roll: 1805098

Problem: 3

Z_1Z_2 (↓ drink, ↓ change)

Input/Output

State Diagram:



State

0 → 00
5 → 01
10 → 10
15 → 11

Input

5 → 10
10 → 4
20 → 00
Change → 01

Transition Table:

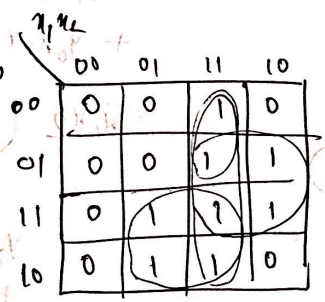
	PS Y_1Y_0	x_1x_2 = 00	01	10	11
0	00	00, 10	00, 00	01, 00	10, 00
5	01	01, 10	00, 01	10, 00	11, 00
10	10	10, 10	00, 01	11, 00	00, 10
15	11	11, 10	00, 01	00, 10	01, 10

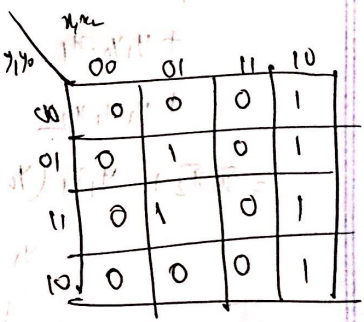
NS, Z

Excitation Table:

y_1y_0 PS	T_1 x_1x_2 00	01	10	11	T_0 x_1x_2 00	01	10	11
0 0	0	0	0	1	0	0	1	0
0 1	0	0	1	1	0	1	1	0
1 0	0	1	0	1	0	0	1	0
1 1	0	1	1	1	0	1	1	0

K map:





$T_1 = y_1x_2 + y_0x_1x_2 + x_1y_0$

$T_0 = x_1\bar{x}_2 + y_0\bar{x}_1x_2$

y_1y_0 \ x_1x_2	00	01	11	10
00	1	0	0	0
01	1	0	0	0
11	1	0	1	1
10	1	0	1	0

$$Z_1 = \bar{x}_1\bar{x}_2 + y_1y_0x_1 + y_1x_1x_2$$

$$= \bar{x}_1\bar{x}_2 + y_1x_1(y_0 + x_2)$$

y_1y_0 \ x_1x_2	00	01	11	10
00	0	0	0	0
01	0	1	0	0
11	0	1	0	0
10	0	1	0	0

$$Z_2 = y_1\bar{x}_1x_2 + y_0\bar{x}_1x_2$$

$$= \bar{x}_1x_2(y_1 + y_0)$$