SECTION C

Attempted questions: (5)

Attached question: 5

a. i.

A	B	C	A+B	A+C	B.C	A+B.C	(A+B).(A+C)
0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0
0	1	0	1	0	0	0	0
0	1	1	1	1	1	1	1
1	0	0	1	1	0	1	1
1	0	1	1	1	0	1	1
1	1	0	1	1	0	1	1
1	1	1	1	1	1	1	1

the last two columns are equivalent so the expressions must be equal

ii. $F = H + 1 \cdot \bar{J} + \bar{K} \cdot L$

$= (H+1)(H+\bar{J}) + \bar{K}L$

$= (\bar{K} \cdot L + H + 1)(\bar{K}L + H + \bar{J})$

$= ((H+\bar{K})(H+L) + 1)((H+\bar{K})(H+L) + \bar{J})$

$= (1 + H + \bar{K})(1 + H + L)(\bar{J} + H + \bar{K})(\bar{J} + H + L)$

b. I_1 I_0 Y_1 Y_0 Z

0 0

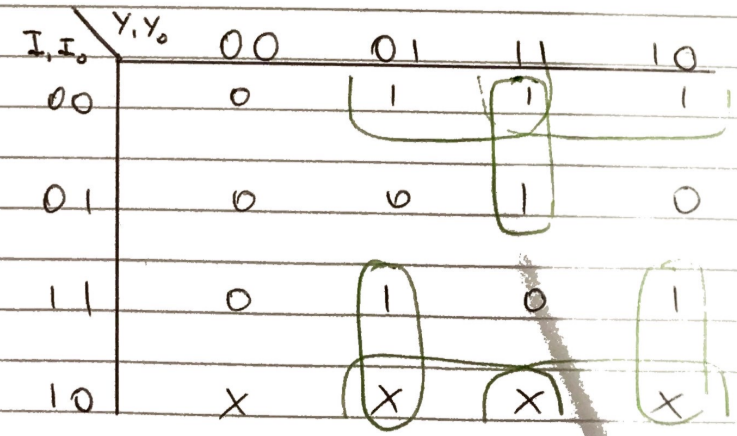
0 1

1 0

1 1

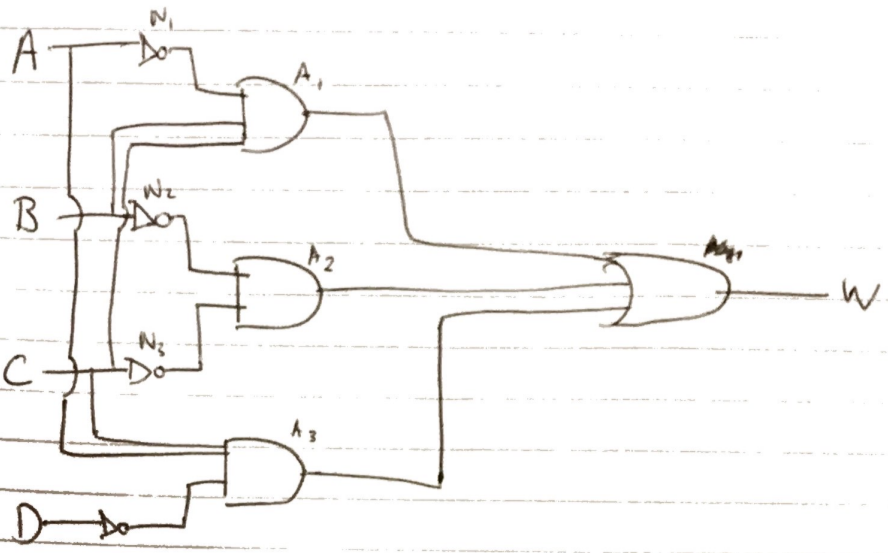
b. i.

I_1	I_0	Y_1	Y_0	Z
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	X
1	1	0	1	X
1	1	1	0	X
1	1	1	1	X



$$Z = \bar{I}_0 Y_0 + \bar{I}_0 Y_1 + I_1 \bar{Y}_1 Y_0 + I_1 Y_1 \bar{Y}_0 + \bar{I}_1 Y_1 Y_0$$
$$= \bar{I}_0 (Y_0 + Y_1) + I_1 (Y_0 \oplus Y_1) + \bar{I}_1 Y_1 Y_0$$

c.



ii. Initially, W is 1 because A_3 is 1
When the state changes, A_3 becomes 0, and then after some delay through N_3, A_2 changes from 0 to 1. During this delay, W becomes 0, and then returns to 1.

iii.

CD \ AB	00	01	11	10
00	1	0	0	
01	1	0	0	1
11	0	1	0	0
10	0	1	1	1

{A, B, C, D} from {0, 1, 1, 0} → {1, 1, 1, 0}

iv. $\bar{B}\bar{C} + \bar{A}BC + AC\bar{D} + A\bar{B}\bar{D} + BC\bar{D}$