Yazan Yousef

1170249

Fincel Part 1

Q1: $F(A,B,C,D) = BC'D' + A'C'D$

k map =>

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

Hazard may occur when moving from:

$\overrightarrow{ABCD}$ => 0100 ⟷ 0101

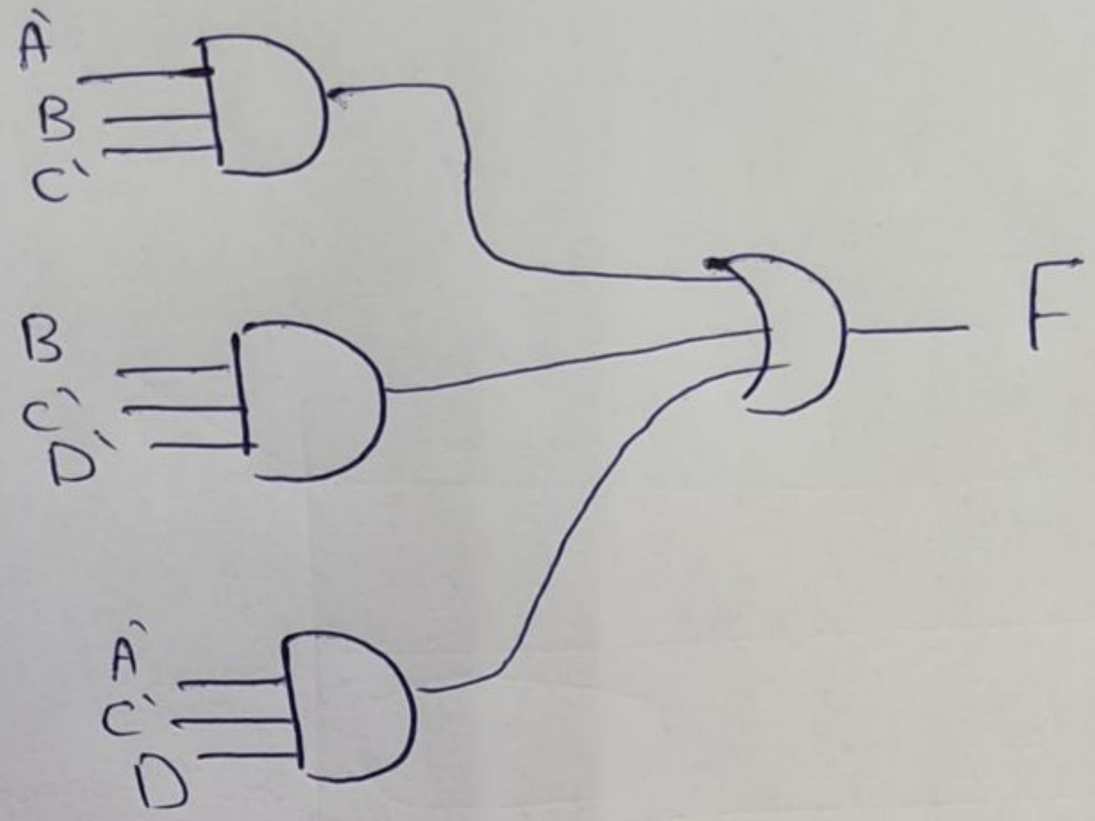
The new added term:

$\boxed{A'BC'}$

New Function:

$$F(A,B,C,D) = \underbrace{A'BC'}_{New.} + BC'D' + A'C'D.$$

logic diagram:

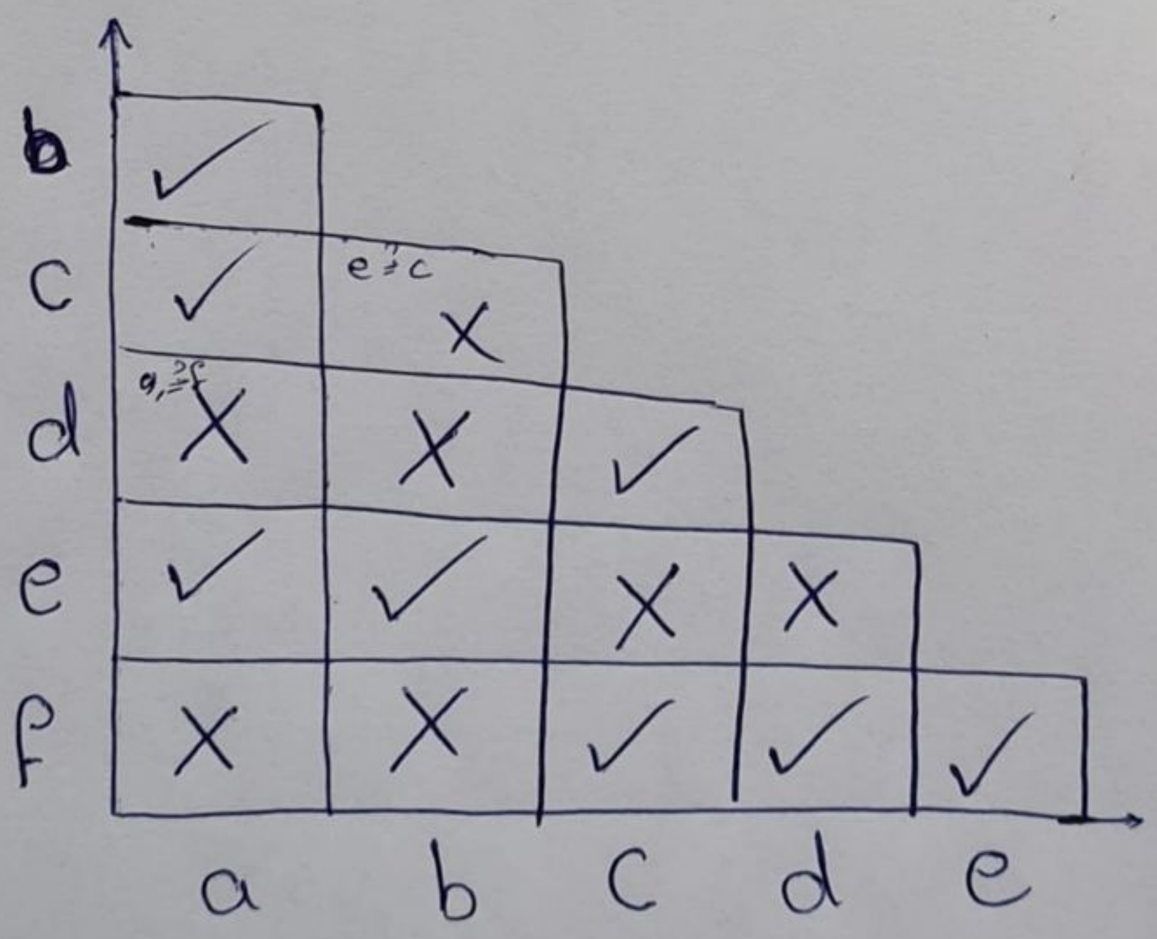


Q2:

Primitive Table:

	x_1x_2 = 00	01	11	10
a	d, -	ⓐ, 1	b, -	-, -
b	-, -	a, -	ⓑ, 1	e, -
c	d, -	-, -	b, -	ⓒ, 0
d	ⓓ, 0	f, -	-, -	c, -
e	d, -	-, -	b, -	ⓔ, 1
f	d, -	Ⓕ, 0	b, -	-, -

Implication Chart:

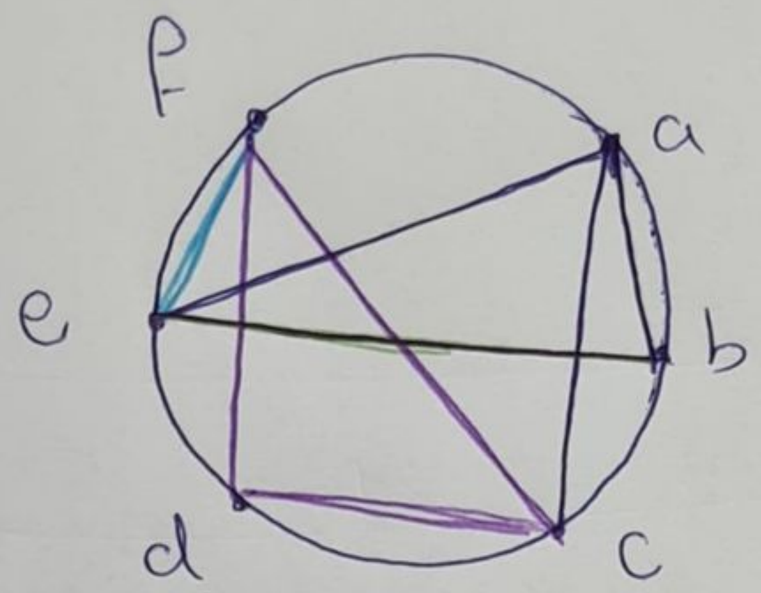


Compatible pairs:

(a, b) (b, e) (c, d) (d, F) (e, F)

(a, c) (c, F)

(a, e)



① (a, b, e)

② (a, c) → included in ① & ③

③ (c, d, f)

④ (e, f) → included in ① & ③

		x_1x_2 00	01	11	10
(a, b, e)	A	d, –	ⓐ, 1	ⓑ, 1	ⓔ, 1
(c, d, f)	B	ⓓ, 0	ⓕ, 0	b, –	ⓒ, 0

x_1x_2

	00	01	11	10
A	B, –	Ⓐ, 1	Ⓐ, 1	Ⓐ, 1
B	Ⓑ, 0	Ⓑ, 0	A, –	Ⓑ, 0

The Final states = 2

state variables = 1 → y_1

let A = 0 → B = 1

y \ x_1x_2	00	01	11	10
0	1, –	0, 1	0, 1	0, 1
1	1, 0	1, 0	0, –	1, 0

For output :

y \ x_1x_2	00	01	11	10
0	X	1	1	1
1	0	0	X	0

$Q = y'$ (5)

For Y :

y \ $x_1 x_2$	00	01	11	10
0	1	0	0	0
1	1	1	0	1

S:

y \ $x_1 x_2$	00	01	11	10
0	1	0	0	0
1	X	X	0	X

$S = x_1' x_2'$

R

y \ $x_1 x_2$	00	01	11	10
0	0	X	X	X
1	0	0	1	0

$R = x_1 x_2$

SR-latch design