

(۱)

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

$$\rightarrow F = A'B'C + A'CD + BCD + ABC + AB'$$

با استفاده از قوانین جبر بول ساده می کنیم

$$F = AB' + B'C + A'CD + BCD + A = AC + B'C' + BCD + A'CD = AC + B'C' + A'BD$$

a)

AB \ C	0	1
0	X	1
1	X	X

$$\rightarrow F = AB' + ABC'$$

b)

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

$$\rightarrow F = A'D + CD + BC'$$

c)

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

$$\rightarrow F = AB' + A'D' + BCD$$

d)

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

$$\rightarrow F = (A+B'+C+D')(A'+B'+D)(A'+C+D)(B+C+D')$$

e)

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

$$\rightarrow F = (B+D')(A+C+D')(B'+C+D)$$

$$F = \sum m(0, 2, 9, 11, 9, 10) + \sum d(5, 12, 13, 14, 15)$$

(۳)

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

$$\rightarrow F' = AC' + CD' + B'D'$$

AB \ C	0	1	2	3
0	1	0	1	1
1	1	1	1	0

AB \ C	0	1	2	3
0	1	1	1	1
1	1	1	1	1

عبارت‌ها با هم برابر نیستند

(۴)

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

$E=0$

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

$E=1$

$$f = \sum m(9, 11, 18, 20, 22, 24, 25, 27, 28, 29, 30)$$

(۵)

الف)

$$f = \prod M(0, 1, 2, 3, 5, 6, 7, 8, 10, 12, 13, 14, 15, 16, 17, 19, 21, 23, 26, 31)$$

$$f = AC'E + AB'D + BD'E + A'CD'E$$

(ج)

$$f = (A+D')(B'+E)(D+E)(A+B+C)(B'+C'+D')(A'+B+C'D)$$

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

$$AD', BC, C'D', BD', AB'C'$$

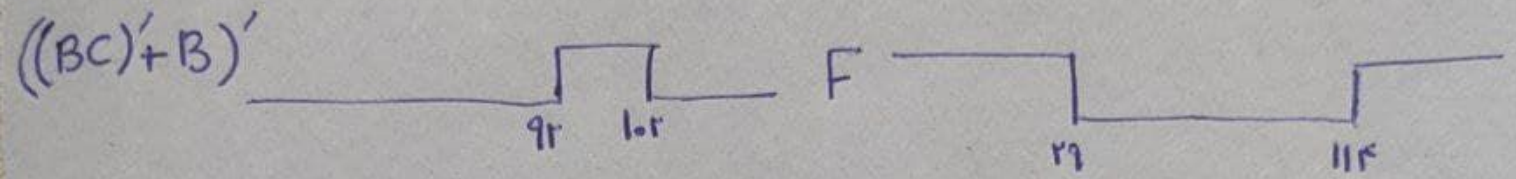
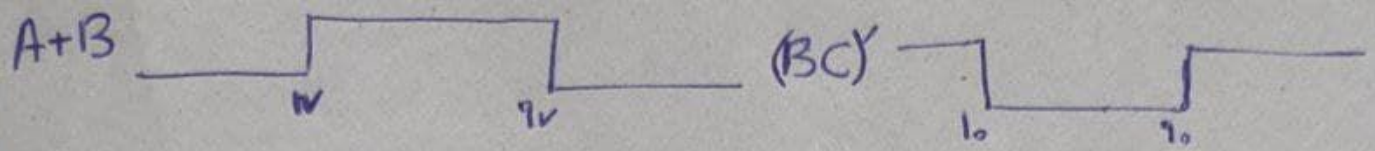
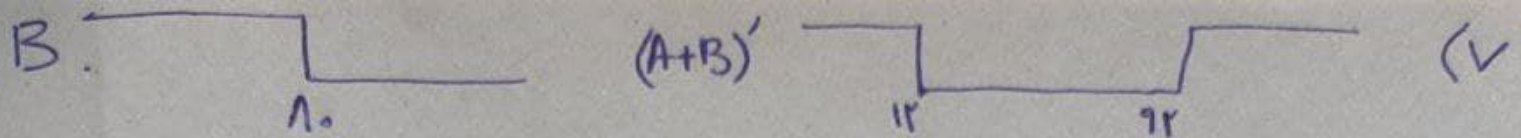
$$BC (0111, 1111), C'D' (0000), AB'C' (1001)$$

$$f(A, B, C, D) = BC + C'D' + AB'C'$$

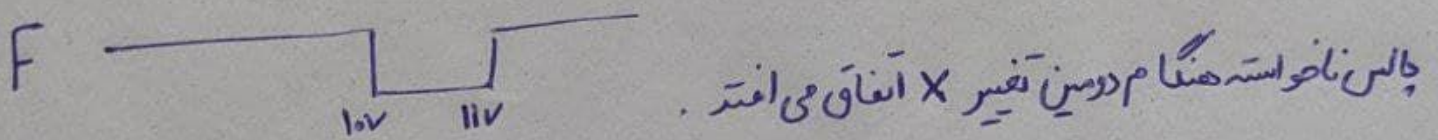
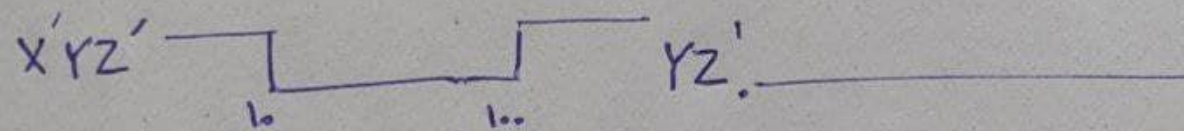
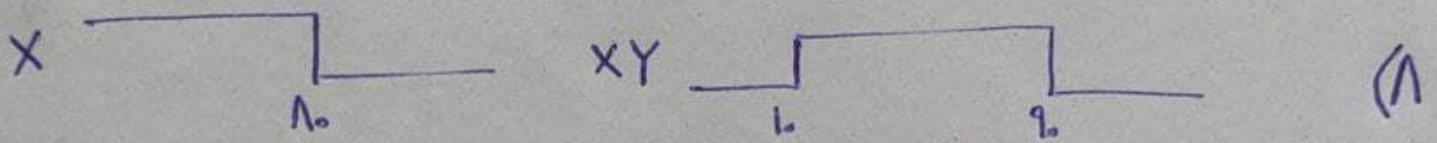
(۶) الف)

ب)

ج)



پالس ناخواسته در خروجی مشاهده نمی شود.



AB
C

1	1	1	0
1	1	1	1
1	1	1	1
0	1	1	1

$B, C, AC, A'C'$

(الف) (9)

$$F = \sum m(0, 1, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15)$$

(ب) هم PI های گفته شده، EPI هستند.

$$f = B + C + AC + A'C'$$

(ج)