Date:

PHẠM NGUYỄN TÙNG AN - 20233825

Đề 02

Câu 1

$F = \Pi M(0,2,6,7,8,15) . D(4,10,11,13)$

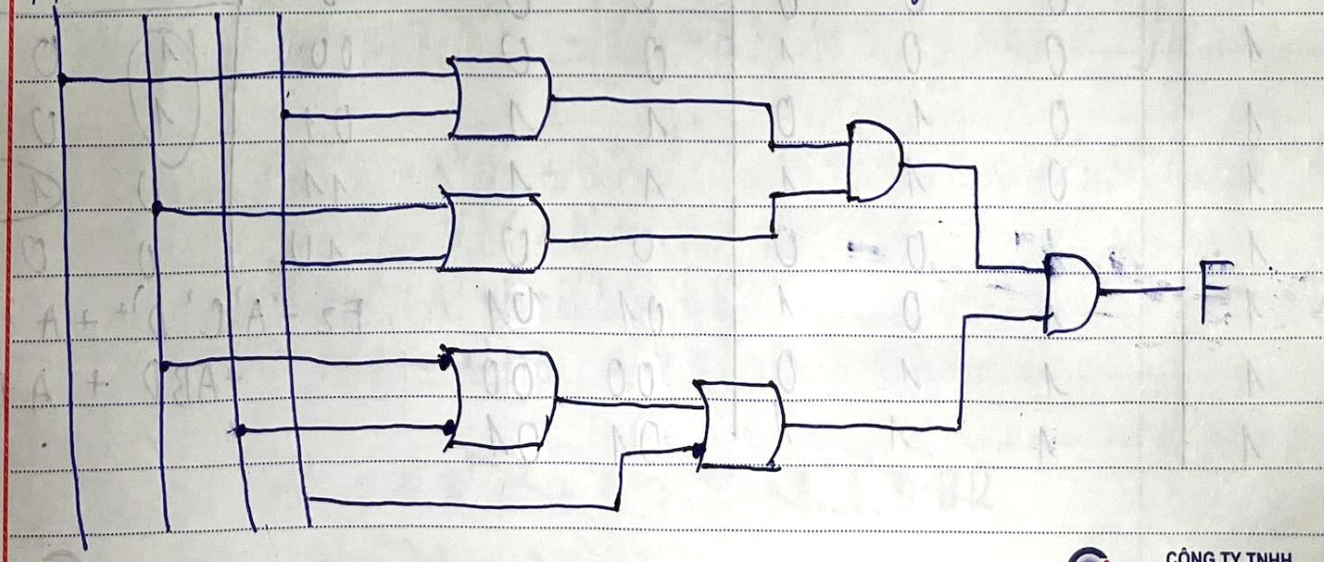
a) F

AB \ CD	00	01	11	10
00	0	1	1	0
01	d	1	0	0
11	1	d	*0 ③	1
10	*0 ②	1	d	d

essential ①, ②

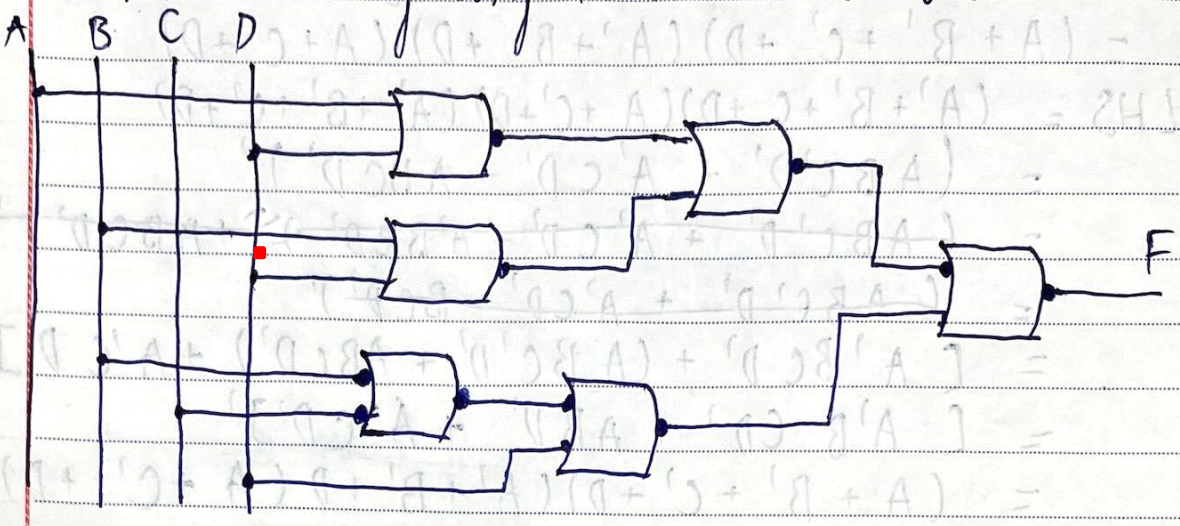
$F = (A+D).(B+D).(AB' + C' + D')$

b) +) Hàm F dùng cổng hai đầu vào



Date:

+) Hàm F dùng cổng NOR hai đầu vào



Câu 3

a) $BC + B'CD + BCD' = BC + CD$

$LHS = BC + B'CD + BCD'$

$= BC + BC.(1+D') + B'CD$ (absorption)

$= BC + B'CD$

$= BC + BCD + B'CD$ (absorption)

$= BC + (B+B')CD$ (bù)

$= BC + CD = RHS$

b) $[(B+CD)' + (BC)']' = BC$

$LHS = [(B+CD)' + (BC)']'$

$= (B+CD).BC$ (de morgan)

$= BC + BCD$

$= BC(1+D)$ (absorption)

$= BC = RHS$

c) $[(B'+C')' + (B'C'D)' + AD']' = B'C'D$

$LHS = [(B'+C')' + (B'C'D)' + AD']'$

$= [(B'+C')' + (B'C'D)' + (A'+D)']'$ (demorgan)

$= (B'+C')(B'C'D)(A'+D)$ (demorgan)

$= (A'B' + A'C' + B'D + C'D)(B'C'D)$ (distribution)

$= A'B'C'D + A'B'C'D + B'C'D + B'C'D$ (distribution)

$= A'B'C'D + B'C'D$ (lũy đẳng)

$= B'C'D = RHS$

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d) $(A'+B'+C+D)(A+C'+D)(A'+B'+C'+D)$

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

LHS $= (A'+B'+C+D)(A+C'+D)(A'+B'+C'+D)$

$= (ABC'D' + A'CD' + ABCD')'$

$= (ABC'D' + A'CD' + A'BCD' + ABCD')'$

$= (ABC'D' + A'CD' + BCD')'$

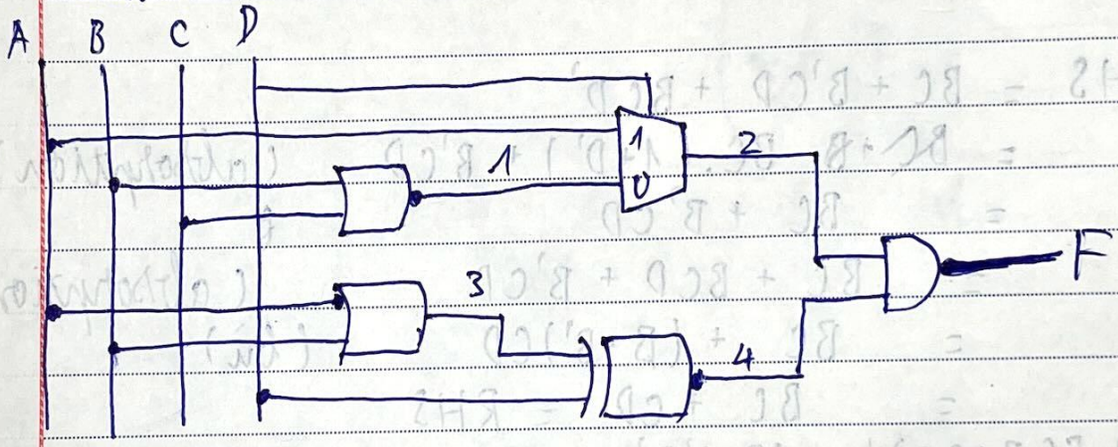
$= [A'BCD' + (ABC'D' + ABCD') + A'CD']'$ (absorption)

$= [A'BCD' + ABD' + A'CD']'$

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

$=$ RHS (demorgan)

Câu 4



1) $(B+C)' = B'C'$

2) $D.A + D'B'C'$

3) $A'+B$

4) $[(A'+B) \oplus D]' = [(A'+B)'.D + (A'+B).D']'$

$= [AB'D + A'D' + BD']' = (A'+B+D').(A+D).(B'+D)$

$= (A'+B+D')(AB' + AD + DB' + D)$

$= A'DB'(A'+B+D')(AB' + D)$

$= A'D + A'DB \quad AD'B' + A'D + BD$

$F = AD + D'B'C' + AD'B' + A'D + BD$

$= D'B'C' + AD'B'$

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Câu 4

$F = (DA + D'B'C')(AD'B' + A'D + BD)$

$= AB'C'D' + ABD$

F

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

$F = \Sigma m$

$F(A,B,C,D) = \Sigma m\ (8, 13, 15)$

Câu 2

bit A: nhà máy X: 0 ; nhà máy Y: 1

bit BCD: loại 1 → 8 tương ứng (0 → 7)

bit F_1 F_2: trạm tái chế 1 → 4 tương ứng (0 → 3)

A	B	C	D	F_1	F_2
0	0	0	0	0	1
0	0	0	1	1	0
0	0	1	0	0	1
0	0	1	1	0	1
0	1	0	0	0	0
0	1	0	1	0	0
0	1	1	0	1	0
0	1	1	1	1	0
1	0	0	0	0	1
1	0	0	1	0	1
1	0	1	0	1	1
1	0	1	1	1	1
1	1	0	0	0	0
1	1	0	1	0	0
1	1	1	0	1	0
1	1	1	1	1	0

F_1

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

$F_1 = BD + A'BC + A'C'D + AB'C$

F_2

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

$F_2 = A'C'D' + A'B'C + ABD + AB'C$

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