من القدس إلى أنت

Format on Ch.1 + Ch.2

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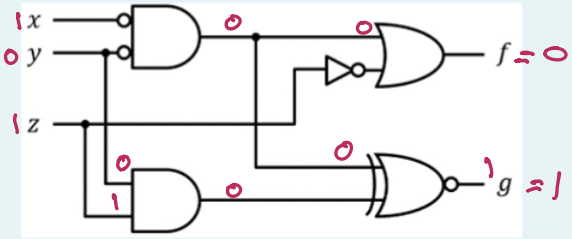
كلُّ محاولاتك عند الله أجور

استعن بالله ولا تعجز

Given the logic diagram below, what is the value of the outputs *f* and *g* when **x = 1**, **y = 0**, and **z = 1**?



OR NOR

	OR	NOR
0 0	0	1
0 1	1	0
1 0	1	0
1 1	1	0

- a. *f* = 0, *g* = 0
- b. *f* = 0, *g* = 1
- c. *f* = 1, *g* = 0
- d. *f* = 1, *g* = 1

The decimal value $(-9)_{10}$ is represented in binary as $(110110)_2$ when the representation system is:

001001 → 110 110 → 1's comp

- a. Unsigned system
- b. Signed 2's complement system
- c. Signed 1's complement system
- d. Signed-magnitude system

Which of the following is the gray code for the value successive with the binary value $(1100)_2$? → gray code

1100 → gray code
1010

- a. 0001
- b. 0101
- c. None
- d. 1011 ✓

Write an algebraic expression for the Boolean function **F(X, Y, Z) = ∏(0, 3, 5, 7)** as a sum-of-minterms.

$\Sigma(1,2,4,6)$

$= \bar{x}\bar{y}z + \bar{x}y\bar{z} + x\bar{y}\bar{z} + xy\bar{z}$

- a. X'Y'Z + X'YZ' + XY'Z' + XY'Z'
- b. ∑(1, 2, 4, 6)
- c. X'Y'Z' + X'YZ' + XY'Z' + XY'Z'
- d. X'Y'Z + X'YZ' + XYZ' + XY'Z' ✓

Which of the following canonical forms represents the complement of the Boolean function **f(a, b, c) = ab + a'b' + b'c**?

	a	b	c	
ab	1	1	0/1	7/6
a'b'	0	0	0/1	0/1
b'c	0/1	0	1	5/1

$= \Sigma(0,1,5,6,7)$

$= \Sigma(2,3,4)$

$= \Pi(0,1,5,6,7)$

- a. ∏(2, 4)
- b. ∏(0, 1, 5, 6, 7) ✓
- c. ∑(2, 4)
- d. ∑(0, 1, 5, 6, 7)

What is the 13's complement of $(B30)_{13}$?

- a. 190
- b. 1A0
- c. 19C
- d. 1AC

$= 12's(B30) + 1$
$= 19C + 1$
$1A0$

Given the following Boolean functions **F** and **G**:

$F(X, Y, Z) = \sum(0, 4, 6) \rightarrow F' = \Sigma(1,2,3,5,7)$
$G(X, Y, Z) = \prod(1, 3, 6) \rightarrow G = \Sigma(0,2,4,5,7)$

$F' \cdot G = (2, 5, 7)$

Express the function **F' · G** as a sum-of-minterms.

as a product of Max terms.
↳ $\pi(6)$.

- a. ∑(2, 5, 7) ✓
- b. ∑(0, 1, 2, 3, 4, 5, 7)
- c. ∑(1, 2, 3, 5, 6, 7)
- d. ∑(2, 4)

Using Boolean Algebraic manipulations, the Boolean function $F(X, Y, Z) = X'(Y' + Z) + XZ$ can be simplified to $F = X'Y' + Z$. This is achieved using which of the following sequences of theorems?

① distribution
② distri

$= x'y' + x'z + xz$
$= x'y' + z(x' + x)$
$= x'y' + z \cdot 1$
$= x'y' + z$

- a. Distribution, Simplification, and then Absorption
- b. Distribution, Distribution, Complement, and then Identity ✓
- c. Distribution, Complement, and then Identity
- d. Distribution, and then Consensus

Carry out the following conversion $(17.1)_8 = (\ ?\ )_4$

$8 \rightarrow 10 \rightarrow 4$
$= 8^1 \times 7 + 8^0 \times 1 + 8^{-1} \times 1$
$= 7 + 8 + \frac{1}{8}$
$= 15.125$

15	4
3	3
0	3

33.01

0.125×4	0.500
0.5×4	2.0

- a. 33.01
- b. None
- c. 15.125
- d. 33.02 ✓

In signed 1's complement representation with 3-bits, what is the largest positive number that can be added to (-1) without causing an overflow?

- a. 4
- b. 3
- c. 2
- d. 1

الأوفر فلو مستخدم يصير بين ⊕ و ⊖
فباخذ أكبر رقم من 3bit بحيث
يبقى 1bit للإشارة
011
و 2bit ← الرقم

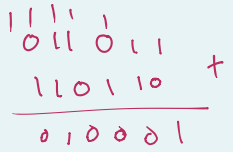
Given the following 6-bit signed numbers:

$A = (011011)_2$

$B = (110110)_2$

The result and overflow when computing A + B using the 2's complement arithmetic are:

- a. 010001, No overflow ✓
- b. 1010001, Overflow
- c. 010010, No overflow
- d. 010001, Overflow



Using algebraic manipulations Simplify the following expression to a minimal number of literals:

A+ A`B+ B`

Select one:

- a. 0
- b. A`
- c. AB
- d. 1
- e. A

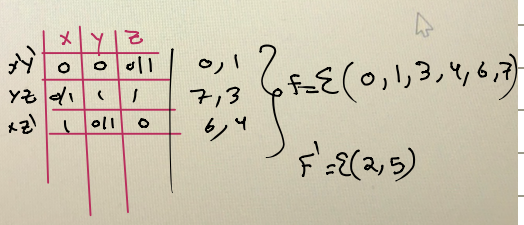
$= A + B + B'$

$= A$

Find the complement of the function in minterm list form:

F(x,y,z) = x`y`+ yz+ xz`

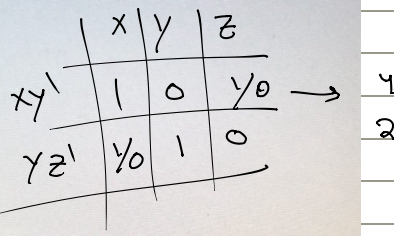
- a. ∑(0,1,3,4,6,7)
- b. ∑(2,5) ✓
- c. ∏(0,1,3,4,6,7)
- d. None
- e. ∏(2,5)



Find canonical SOP of the standard function:

F(x,y,z) = xy`+yz`

- a. ∏(0,1,3,6,7)
- b. ∏(2,4,5,6)
- c. ∑(0,1,3,7)
- d. ∑(2,4,5,6) ✓
- e. None



The magnitude of $(-122)_{10}$

a. 100001111010

b. 111110000110

c. 000001111010

d. 011110000110

122	2
61	0
30	1
15	0
7	1
3	1
1	1
0	1

1111010
as magnitude
↓
without signed

What's the complement of F(A,B,C)= ∏(0)

As a sum of products

$F' = \Sigma(0)$

a. ∏(1,2,3,4,5,6,7)

b. Σ(1,2,3,4,5,6,7)

c. A+B+C

d. Σ(0)

e. A`+B`+C`

Perform the following operation $(101101)_2 - (110110)_2 = (\ ?\ )_2$, using 6-bit 2's complement representation?

a. 100011

b. 110111

c. 110110

d. 1100011

101101
010010 +
010011
16+3=19
-19

110110
001010
-10

-19 - -10 = -9

001001
110110 +
1

111111

1
101101
001010 +
110111

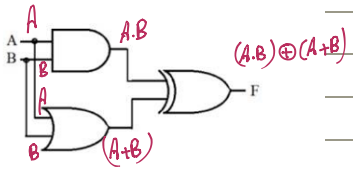
52) What is the output of the following circuit?

a. AB

b. A+B

c. A'B'+AB

d. A'B+AB'



let (A.B) = y

let (A+B) = d

y ⊕ d

$yd' + dy'$

$= (A.B)(A'B') + (A+B)(A'+B')$

$= 0 + AA' + AB' + BA' + BB'$

$= AB' + A'B$ ✗

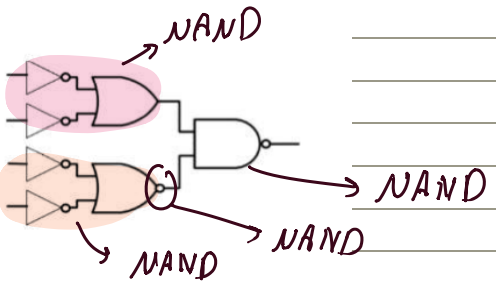
51) The shown circuit can be implemented using a minimum of :

a. 3 NAND Gates

b. 4 NAND Gates

c. 5 NAND Gates

d. 4 NAND Gates and 1 NOR Gate



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$F = \Sigma(0,2,5,6)$

$G = \Pi(1,2,5,7) = \Sigma(0,3,4,6)$

$G' = \Sigma(1,2,5,7)$

$F.G' = \Sigma(2,5)$.