00 : 09 : 59

Convert the Hexadecimal number (1E.4) into Decimal number

(1*16^1)+ (14*16^0)+(4*16^-1) = 30.25

- ○ 29.25
- ○ 30.5
- ○ 30.25
- ○ 30.125

00 : 08 : 35

Convert the Decimal number (26.25) into Octal number

- 23.4
- 23.2
- 32.4
- 32.2

00 : 07 : 42

Convert the Decimal number (18.125) into Binary number

- 10010.010
- 10010.001
- 10011.010
- 01001.001

00 : 06 : 32

The Binary subtraction using 2's complement of the Binary numbers: F= (1010) - (1100) is

- F= -01
- F= 10
- F= 01
- F= -10

00 : 06 : 35

Convert the Octal number (25.1) into Decimal number

- 21.5
- 12.125
- 21.25
- 21.125

00 : 06 : 26

The Octal number (65.12) is equivalent to Hexadecimal number

- ○ B1.28
- ○ 35.22
- ○ 35.28
- ○ 35.0A

00 : 06 : 46

Convert the Hexadecimal number (1E.4) into Decimal number

- 29.25
- 30.5
- 30.25
- 30.125

Next

Clear Answers

Question Total Count : 6

00 : 08 : 18

Convert the Decimal number (18.125) into Binary number

- 10010.001
- 01001.001
- 10011.010
- 10010.010

Next

Clear Answers

Question Total Count : 6

00 : 09 : 56

Convert the Octal number (25.1) into Decimal number

- ○ 21.5
- ○ 21.125
- ○ 21.25
- ○ 12.125

Next

Clear Answers

Question Total Count : 6

00 : 05 : 04

The Octal number (65.12) is equivalent to Hexadecimal number

- 35.0A
- 35.28
- B1.28
- 35.22

Next

Clear Answers

Question Total Count : 6

00 : 02 : 23

Convert the Decimal number (26.25) into Octal number

- 32.4
- 23.2
- 23.4
- 32.2

Next

Clear Answers

Question Total Count : 6

Not Visited

Not Answered

00 : 03 : 04

The Binary subtraction using 2's complement of the Binary numbers: F= (1010) - (1100) is

- F= 10
- F= -01
- F= -10
- F= 01

Next

Clear Answers

Question Total Count : 6

Not Visited Not Answered

00 : 03 : 12

Select the Boolean expression that is not equivalent to $x \cdot x + x \cdot x'$

- ○ x
- ○ x.(x+ x')
- ○ (x+ x').x
- ○ x'

Next

Clear Answers

00 : 05 : 36

Simplify Y = AB(A + B).

- Y=1
- Y=AB
- Y=B
- Y=A

Next

Clear Answers

00 : 04 : 24

Select the expression which is not equivalent to: $x \cdot (x' + y) + y$

- $x \cdot x' + y \cdot (1 + x)$
- $x. y$
- $0 + x \cdot y + y$
- y

Next

Clear Answers

00 : 05 : 09

The Decimal number (83) is expressed in (2 4 2 1) code as (1000 0011)

- T
- F

Next

Clear Answers

Question Total Count : 10

Not Visited	Not Answered
4	0

Answered

00 : 02 : 02

The Decimal number (35) is expressed in (8 4 -2 -1) code as (0011 1011)

- F
- T

Next

Clear Answers

Question Total Count : 10

Not Visited	Not Answered
1	0

Answered

00 : 06 : 12

Simplify F = A’ + AB’ + B

- AB' + A
- AB'
- AB' + B
- 1

Next

Clear Answers

00 : 06 : 48

The Boolean function X + YZ is a reduced form of (X + Y)(X + Z).

- F
- T

Next

Clear Answers

Question Total Count : 10

Not Visited	Not Answered
7	0

Answered

3

00 : 07 : 17

The Boolean function A + BC is a reduced form of

- A'B + AB'C
- (A + B)(A + C)
- AB + BC
- (A + C)B

Next

Clear Answers

00 : 08 : 15

The Boolean expression: A(A + B) is equivalent to A

- F
- T

Next

Clear Answers

Question Total Count : 10

Not Visited	Not Answered
9	0

Answered

1

00 : 09 : 59

The Decimal number (70) is equivalent of the excess-3 number (1010 0011)

- ○ T
- ○ F

Next

Clear Answers

Question Total Count : 10

Not Visited	Not Answered
10	0

[1] The Decimal number (27.5) is equivalent to the Hexadecimal number (1B.4).

(a) T (b)F

[2] The Decimal number (12.125) is equivalent to the Binary number (1100.001).

(a)T (b) F

3 The Binary number (1010.01) is equivalent to the Decimal number (8.25).

(a) T (b)F

[4] The Binary number (101010.11) is equivalent to Hexadecimal number (2A.B).

(a) T (b)F

[5] The Binary number (1011.1011) is equivalent to Octal number (13.54).

(a)T (b) F

(6) The Hexadecimal number (3A.8) is equivalent to the Binary number (111011.1).

(a)T (b)F

[7] The Boolean expression: X.X + X.X' is equivalent to: X.

(a) T (b) F

[8] The Boolean Function F(A, B) =m0+m3 is equivalent to F(A, B) = A' .B'+A.B.

(a) T (b)F

[9] The canonical sum of product of the function: F(X, Y) = X'. Y + Y is F=m1+m2.

(a)T (b)F

[10] The Boolean expression: A(B + A') + A is equivalent to: B.

(a) T (b)F

[11] The Binary subtraction using 2's complement of the Binary numbersF = (11100) - (101110)...

(a) F = - 10010 b) F = - 00101(c) F = 01011 (d) F = 01010

[12] Convert the Hexadecimal number (6C.B2) into Octal number.....

(a) 154.541 (b) 164.544 (c) 314.13 (d) 154.544

[13] Express the decimal number (83) in 2421 codes...

(a) 1110 0111 (b) 1110 0111 (c) 11100011 (d) 01000011

[14] Convert Binary number 111010 into Gray code.....

(a) 100101 (b) 100110 (c) 101101 (d) 100111

[15] Convert Gray code 100111 into Binary number....

(a) 111010 (b) 110110 (c) 111101 (d) 110111

[16] Obtain the canonical sum of product the function: F (X, Y) = X'.Y + Y

(a) F =m1+m2 (b) F =m1+m3 (c) F =m0+m3(d) F =m0+m1

[17]For the Boolean function F(x, y, z) =m1+m3+m5 the complete expressionis...

(a) F= x'.y'.z +x'.y.z +x.y'.z (b)F= x'.y'.z +x'.y.z + x.y'.z

(c) F= x'.y'.z +x'.y.z' + x.y'.z (d) F= x'.y'.z +x'.y.z + x.y'.z'

[18] Select the expression which is not equivalent to:

x(x' + y) + y

(a)x.x' + y(1 + x) (b) 0 + x.y + y (c) x.y (e) y

[19] The Boolean function A + BC is a reduced form of

(a) AB + BC (b) A'.B + A.B'.C (c) (A + B)(A + C) (d) (A + C) B

[20] Simplify Y = AB(A + B)

(a) Y = A (b) Y = B (c)Y = AB (d) Y = 1

00 : 01 : 59

The Boolean Function F(A, B)= m0 + m2 is equivalent to F(A,B)= A'B'+AB

- ○ True
- ◉ False

التالى

تفريغ الخانات

عدد الاسئلة الكلي : 7

لم يتم رؤيته	لم يتم إجابته
1	0

تم إجابته

6

00 : 02 : 30

The canonical sum of product of the function: F (X, Y) = X'Y + Y is F =m1+m2

- (●) F
- ( ) T

التالى

تفريغ الخانات

عدد الاسئلة الكلي : 7

لم يتم رؤيته	لم يتم إجابته
2	0

تم إجابته

5

00 : 03 : 43

Obtain the canonical product of sum form of the function. F (A, B) = A + AB'

- (●) F=M0. M1
- ( ) F=M1. M3
- ( ) F=M1. M2
- ( ) F=M0. M2

التالى

تفريغ الخانات

عدد الاسئلة الكلي : 7

The canonical product of sum form of the function: F (A, B) = A + AB’ is M0.M1

- (●) T
- ( ) F

التالى

تفريغ الخانات

عدد الاسئلة الكلي : 7

لم يتم رؤيته	لم يتم إجابته	تم إجابته
4	0	3

00 : 06 : 16

Obtain the canonical sum of product form of the function: F (A, B) =A+ A'B

- ○ F=m0+m2+m3
- ○ F=m1+m2
- ○ F=m0+m1+m3
- ◉ F=m1+m2+m3

التالى

تفريغ الخانات

عدد الاسئلة الكلي : 7

00 : 08 : 29

The Boolean Function F(A,B)= M1.M3 is equivalent to F(A,B)= (A'+B).(A'+B')

- ○ T
- ◉ F

التالى

تفريغ الخانات

عدد الاسئلة الكلي : 7

لم يتم رؤيته	لم يتم إجابته
6	0

تم إجابته

1

00 : 09 : 14

For the Boolean function F(x,y,z) = m1+ m3+ m5 the complete expression is

- F=x'y'z'+ x'yz+ xy'z
- F=x'y'z+ x'yz'+ xy'z
- F=x'y'z+ x'yz+ xy'z
- F=x'y'z+ x'yz+ xy'z'

التالى

تفريغ الخانات

عدد الاسئلة الكلي : 7

00 : 27 : 30

Convert the Decimal number (18.125) into Binary number

- 01001.001
- 10010.010
- 10010.001
- 10011.010

Next

Clear Answers

00 : 26 : 46

The Hexadecimal number (3A.8) is equivalent to the Binary number (111011.1)

١١١٠١١.١ ← ٣٨.٨

- ○ True
- ● False

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered
19	0

Answered

00 : 25 : 44

Express the function Y(a,b,c)= M1.M3.M4.M7 as a sum of min terms

- Y=m1+ m2+ m5+ m6
- Y=m0+ m2+ m4+ m6
- Y=m0+ m2+ m5+ m6
- Y=m0+ m3+ m5+ m6

Next

Clear Answers

00 : 25 : 06

Complement of the expression A'B + CD' is (A + B') (C' + D)

- True
- False

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered	Answered
17	0	

00 : 23 : 07

Convert the Decimal number (26.25) into Octal number

- 32.2
- 23.4
- 23.2
- 32.4

Next

Clear Answers

Question Total Count : 20

Not Visited Not Answered

00 : 22 : 55

Sum-of-Products expressions can be implemented using _____

- 2-level OR - AND logic circuits
- 2-level NOR logic circuits
- 2-level XOR logic circuits
- 2-level NAND logic circuits

Next

Clear Answers

00 : 21 : 29

The Binary number (1110.01) is equivalent to the Decimal number (14.5)

14.25

- (●) False
- ( ) True

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered	Answered
14	0	6

00 : 20 : 25

Express the decimal number (83) in 2421codes

- 1110 0011
- 0100 0011
- 1110 0111
- 1110 0111

Next

Clear Answers

Question Total Count : 20

00 : 19 : 19

The Binary number (101010.11) is equivalent to Hexadecimal number (2A.B)

00101010.1011

- ○ True
- ◐ False ✓

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered
12	0

Answered

8

00 : 18 : 48

The Boolean expression: A(B + A') + A is equivalent to: B

- ○ False
- ◉ True ✓

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered
11	0

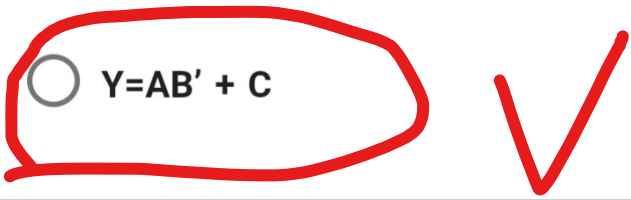
Answered

9

00 : 16 : 50

Simplify Y = AB’ + (A’ + B)C.

- Y=A'B + AC
- Y=A'B + C
- Y=AB + AC
- Y=AB’ + C



Next

Clear Answers

Question Total Count : 20

Not Visited Not Answered

00 : 15 : 26

The Binary number (1011.1011) is equivalent to Octal number (13.54)

- (●) True
- ( ) False

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered	Answered
9	0	11

00 : 12 : 55

Convert the Octal number (25.1) into Decimal number

- 21.5
- 21.125
- 12.125
- 21.25

Next

Clear Answers

Question Total Count : 20

00 : 12 : 14

The Octal number (15.4) is equivalent to the Binary number (1101.1)

- ○ False
- ● True

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered	Answered
7	0	13

00 : 10 : 39

Obtain the canonical product of sum form of the function. F (A, B) = A + AB'

- F=M0. M2
- F=M1. M3
- F=M1. M2
- F=M0. M1

Next

Clear Answers

00 : 09 : 58

The Boolean expression: A +A'B is equivalent to: A+B

- (●) True
- ( ) False

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered	Answered
5	0	15

00 : 09 : 22

The Binary subtraction using 2's complement of the Binary numbers: F= (1010) - (1100) is

- F= 01
- F= 10
- F= -10
- F= -01

Next

Clear Answers

Question Total Count : 20

00 : 07 : 45

Convert the Hexadecimal number (1E.4) into Decimal number

- 30.5
- 29.25
- 30.125
- 30.25

Next

Clear Answers

00 : 06 : 46

The Boolean Function F(A, B)= m0 + m2 is equivalent to F(A,B)= A'B'+AB

- ○ True
- ○ False

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered	Answered
2	0	18

00 : 06 : 05

Complement of Boolean Function F(A,B)= m1+ m3 is equivalent to F'= M1.M3

- ○ True
- ○ False

Next

Clear Answers

Question Total Count : 20

Not Visited	Not Answered
1	0

Answered

00 : 18 : 27

Simplify the Boolean function F, together with the don't-care condition d

F(A,B,C,D)= m2,m4,m10,m11 , d(A,B,C,D) = m1,m3,m6

- F = A'BD'+ B'D
- F = A'B'D' + B'C
- F = AB'C + B’C
- F = A'BD'+ B'C

التالى

00 : 11 : 03

Using Karnaugh map method, Simplify the following function

$$F(A,B,C) = AB' + A'C + ABC$$

- F =AB + AC
- F =AB' + C
- F =A'B + AC'
- F =AB + A

التالى

تفريغ الخانات

00 : 07 : 51

A combinational circuit with three inputs (a, b, c) and one output (z). The output is 0 when the binary value of the inputs is less than 5, and the output is 1 otherwise. Find output(z)

- z=ab+bc
- z=ab'+ac
- z=ab+ac
- z=ac+bc

التالى

تفريغ الخانات

00 : 05 : 42

Using Karnaugh map method, Simplify the following function:

F(A,B,C) = m3+m4+m6+m7

- F = AC + BC
- F = A'C + BC
- F = AC' + AB
- F = AC'+ BC

التالى

تفريغ الخانات

00 : 04 : 47

For a half - adder, the outputs sum and carry are given by

- sum =m0 + m2, carry =m3
- sum =m0 + m1, carry =m3
- sum =m1 + m2, carry =m3
- sum =m1 + m2, carry =m2

التالى

تفريغ الخانات

00 : 19 : 03

How many NOT gates and AND gates are required for the construction of a 4-to-1 multiplexer?

- 3 NOT gates and 5 AND gates
- 3 NOT gates and 4 AND gates
- 2 NOT gates and 4 AND gates
- 2 NOT gates and 5 AND gates

Next

QUIZ تصميم منطقي - الفصل الدراسى الأول - اللائحة الداخلية
حسناء عثمان يوسف احمد حبيب

00 : 18 : 13

How many OR gates are required for an Octal-to-Binary encoder?

- Number of OR gates =2
- Number of OR gates =4
- Number of OR gates =3
- Number of OR gates =8

Next

Clear Answers

00 : 13 : 58

F(A,B,C,D)= m1+m3+m7+m11+m15 d(A,B,C,D) = m0+m2+m5

- F = A'B' + B'C
- F = A'D+ CD
- F = A'B'+ CD
- F = A'B' + A'B

Next

Clear Answers

Question Total Count : 7

00 : 13 : 42

5

How many AND gates are required for a 3-to-8 Decoder?

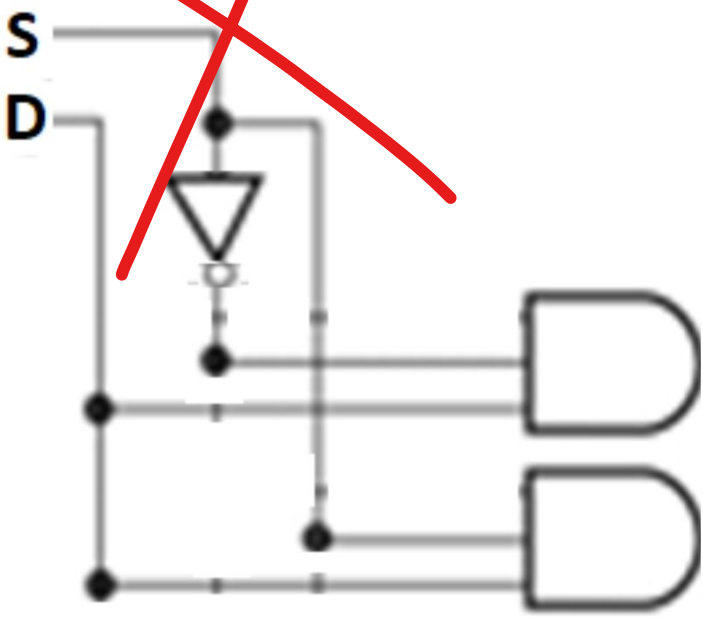
- Number of AND gates =2
- Number of AND gates =10
- Number of AND gates =8
- Number of AND gates =3

Next

Clear Answers

00 : 13 : 31

Mention the type of the following circuit? if S = 1, then the output will be



- Multiplexer, output Y0=D
- De-multiplexer, output Y1=D
- Multiplexer, output Y1=D

00 : 10 : 38

Using Karnaugh map method, Simplify the following function

F(A,B,C) = AB' + (A' + B)C.

- (●) F =AB' +C
- ( ) F =AB + A
- ( ) F =A'B + AC'
- ( ) F =A'B + C

Next

Clear Answers

00 : 10 : 27

If a Decoder has two inputs, then the output is given by

- m0, m1, m2, m3
- m0, m1, m3, m4
- m1, m2, m3, m4
- m0, m1, m2, m4

Next

Clear Answers

Question No.1

a) (1) $(10110.0101)_2$

$= 0\times2^0 + 1\times2^1 + 1\times2^2 + 0\times2^3 + 1\times2^4 + 0\times2^{-1} + 1\times2^{-2} + 0\times2^{-3} + 1\times2^{-4}$

$= (22,3125)_{10}$

---

(2) $(26.24)_8$

$= 6\times8^0 + 2\times8^1 + 2\times8^{-1} + 4\times8^{-2}$

$= (22,3125)_{10}$

---

(3) $(1C.5B)_{16}$

$= 12\times16^0 + 1\times16^1 + 5\times16^{-1} + 11\times16^{-2}$

$= (28,355)_{10}$

---

(4) $(43.12)_5$

$= 3\times5^0 + 4\times5^1 + 1\times5^{-1} + 2\times5^{-2}$

$= (23,28)_{10}$

---

b) $(24.125)_{10}$

→ To Binary:-

		ĵWI
24 / 2	= 12	0
12 / 2	= 6	0
6 / 2	= 3	0
3 / 2	= 1	1
1 / 2	= 0	1

0.125 * 2	= 0.25	0
0.25 * 2	= 0.5	0
0.5 * 2	= 1	1

$= (11000.001)_2$

→ To octal:-

		ĵWI
24 / 8 =	3	0
3 / 8 =	0.375	→ * 8 = 3

0.125 * 8 = 1

$= (30.1)_8$

→ To HexadeCimal:

24/16 = 1.5
1/16 = 0.0625

0.5 * 16 = 8
0.0625 * 16 = 1 ↑

0.125 * 16 = 2

$= (18.2)_{16}$

(c) ① M = 11011 , N = 10001 → 2's Complement

M − N = 01111

```
 1 1 1 1
 1 1 0 1 1
+ 0 1 1 1 1
-----------
(1) 0 1 0 1 0
```

Carry

∴ M − N = 01010

---

② M = 10001 , N = 11011 → 2's comp 00101

```
  1 0 0 0 1
+ 0 0 1 0 1
-----------
  1 0 1 1 0
```

2's comp → 01010

∴ M − N = −(01010)

d) 6.24

→ BCD code: (8 4 2 1)

6 → 0 1 1 0
2 → 0 0 1 0
4 → 0 1 0 0

$= (0110.0010\ 0100)_{BCD}$

→ (2 4 2 1) code

6 → 1 1 0 0
2 → 0 0 1 0
4 → 0 1 0 0

$= (1100.0010\ 0100)_{2421}$

→ excess-3 code:

6.24
+3
9.57

$= (1001.0101\ 0111)_{excess3}$

(8 4 2 1)

9 → 1 0 0 1
5 → 0 1 0 1
7 → 0 1 1 1

(F) (1) $14/2 = 5$

$1B' + 4B^\circ / 2B^\circ = 5B^\circ$

$B + 4 / 2 = 5$

$B + 4 = 10$

$B = 10 - 4$

$\boxed{B = 6}$

(2) $54/4 = 13$

$5B' + 4B^\circ / 4B^\circ = 1B' + 3B^\circ$

$5B + 4 / 4 = B + 3$

$5B + 4 = 4B + 12$

$\boxed{B = 8}$

(3) $24 + 17 = 40$

$2B' + 4B^\circ + 1B' + 7B^\circ = 4B' + 0B^\circ$

$2B + 4 + B + 7 = 4B$

$3B + 11 = 4B$

$\boxed{B = 11}$

Question No. 2

(a) $A'C + A'B + AB'C + BC$

$A'(C+B) + C(AB'+B)$

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

$A'C + A'B + A'C + BC$

$C(A'+A) + BC + A'B$

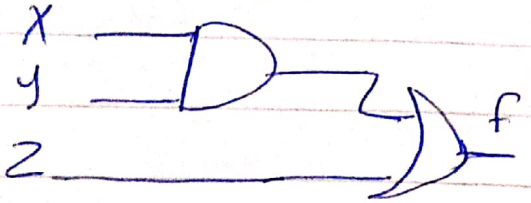
$= C + BC + A'B$

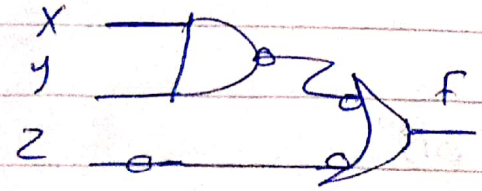
$C(1+B) + A'B$

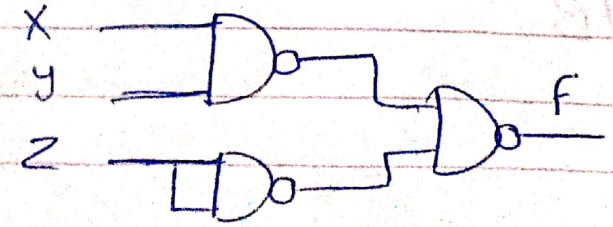
$= A'B + C$

(b) $F = XY + Z$

(NAND)



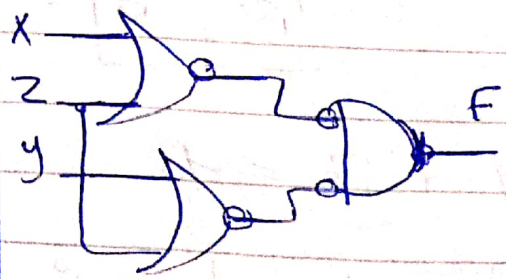


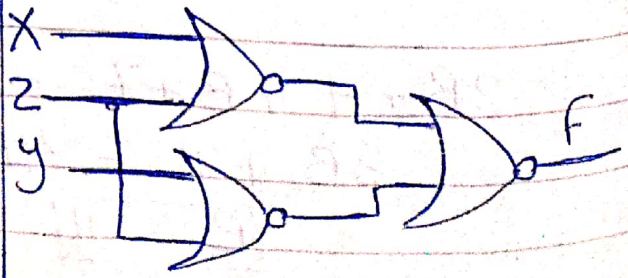


(NOR)

$F = XY + Z$

$= (X+Z)(Z+Y)$





Question No. 3

(a) $F = A(A+B+C)(A'+B+C)(A+B'+C)(A+B+C')$

$= (A+BB'+CC')(A+B+C)(A'+B+C)(A+B'+C)(A+B+C')$

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

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

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

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

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

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

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

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

$= AA' + AB + AC$

$= AB + AC$ #

(b) $y = AB + B'CD$, Convert to POS.

Sol:

$$y = AB(C+C')(D+D') + (A+A')B'CD$$

$$= ABCD + ABCD' + ABC'D + ABC'D' + AB'CD + A'B'CD$$

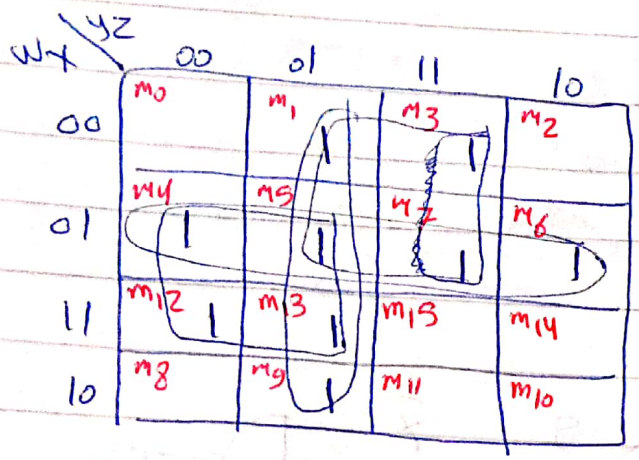
$$= \Sigma(15, 14, 13, 12, 11, 3)$$

$$\therefore POM = \Pi(0, 1, 2, 4, 5, 6, 7, 8, 9, 10)$$

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

Question No. 4

(a)

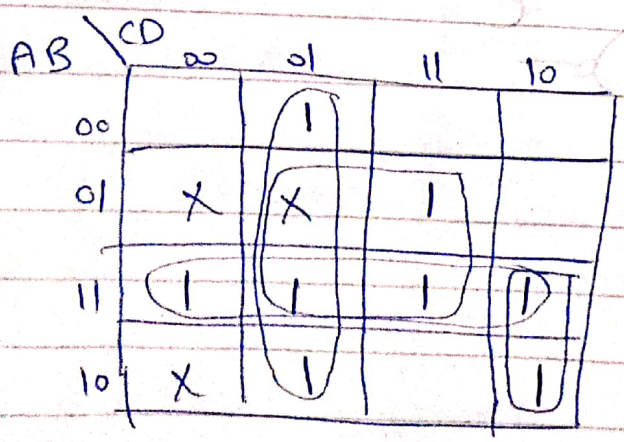


$$F = \bar{w}x + \bar{y}z + \bar{w}z + x\bar{y}$$

$$POS = \pi(0, 2, 8, 10, 11, 14, 15)$$

$$= (w + x + y + z)(w + x + \bar{y} + z)(\bar{w} + x + y + z)(\bar{w} + x + \bar{y} + z)$$
$$(\bar{w} + x + \bar{y} + \bar{z})(\bar{w} + \bar{x} + \bar{y} + z)(\bar{w} + \bar{x} + \bar{y} + \bar{z})$$

(b)



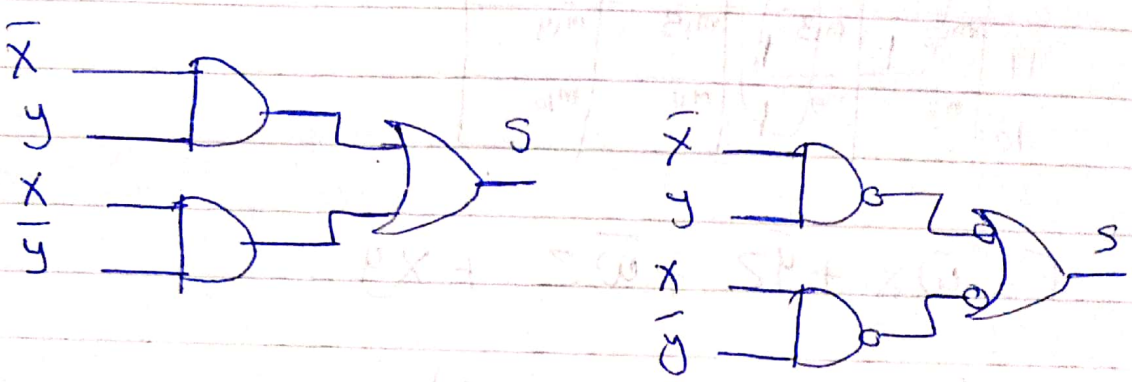
$$F = AB + \bar{C}D + BD + AC\bar{D}$$

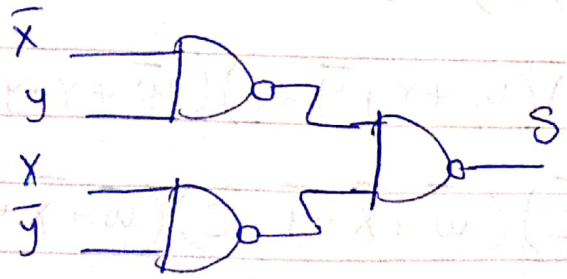
Question No. 5

(a) NAND gates :-

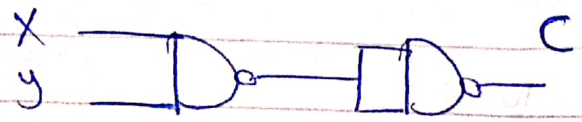
$$S = \bar{X}y + X\bar{y}$$

$$C = Xy$$

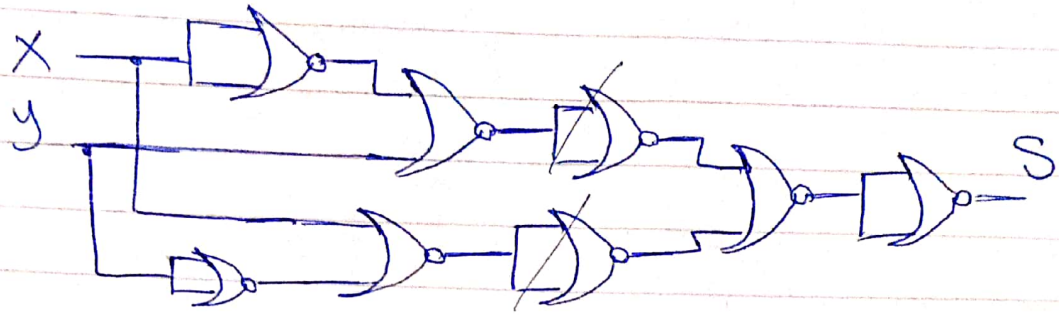


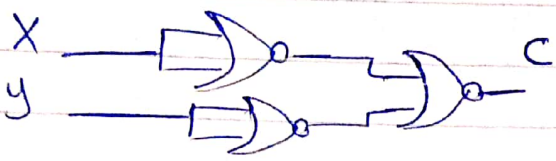


(b)



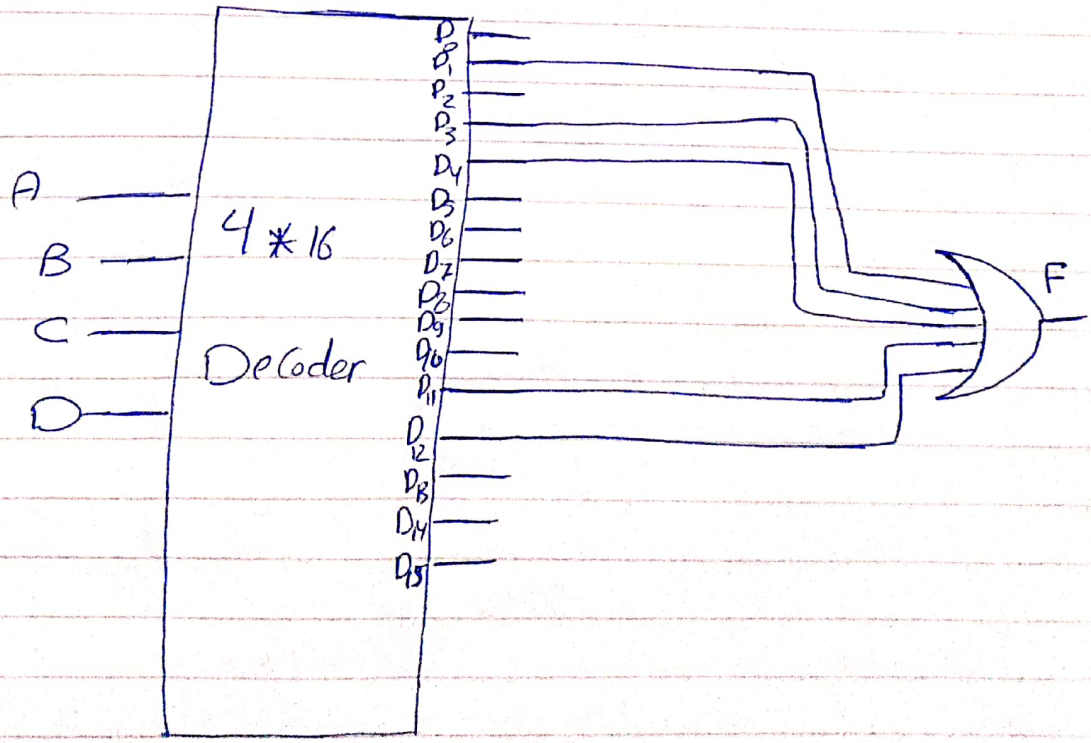
(b) NoR gates:-





Question No.6

(b)



(a)

Question No.6

	Inputs			outputs		
	x	y	z	A	B	C
m_0	0	0	0			
m_1	0	0	1	1	0	0
m_2	0	1	0	0	1	0
m_3	0	1	1	0	1	1
m_4	1	0	0	1	0	0
m_5	1	0	1	1	0	1
m_6	1	1	0	1	0	0
m_7	1	1	1			

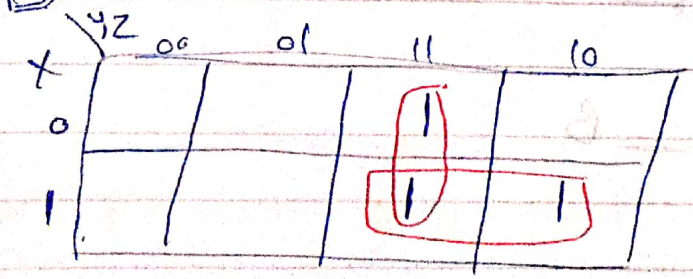
$$A = \bar{x}yz + xy\bar{z} + xyz$$

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

$$C = \bar{x}\bar{y}\bar{z} + \bar{x}y\bar{z} + x\bar{y}z + xyz$$

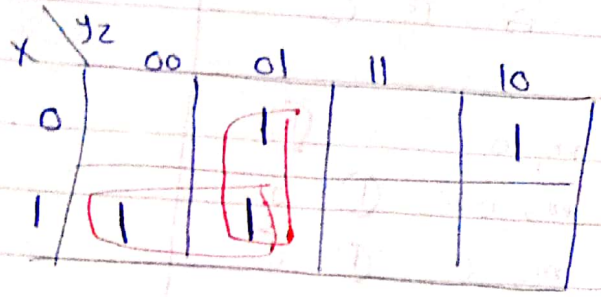
⇒ simplify:

(A)



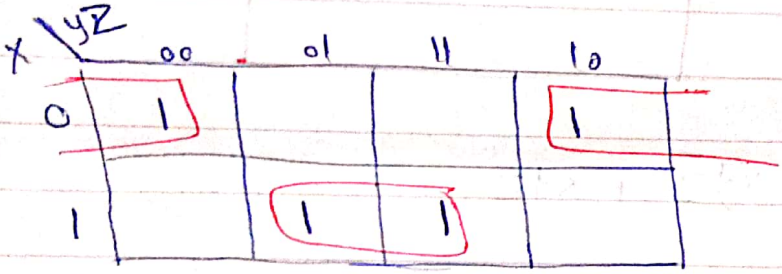
$\therefore A = xy + yz$

(B)

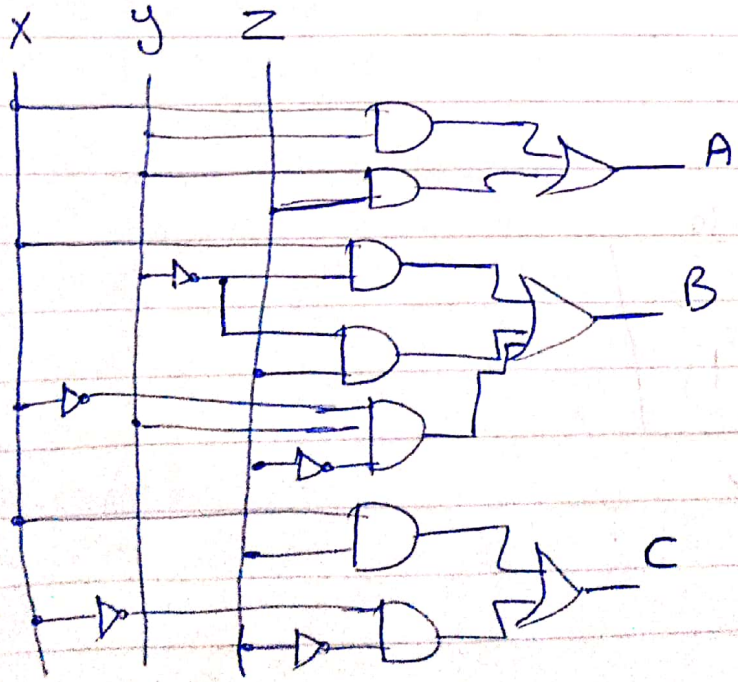


$\therefore B = X\bar{y} + \bar{y}z + \bar{X}yz$

(C)



$\therefore C = XZ + \bar{X}\bar{Z}$



⇒ Examples on Designing:-

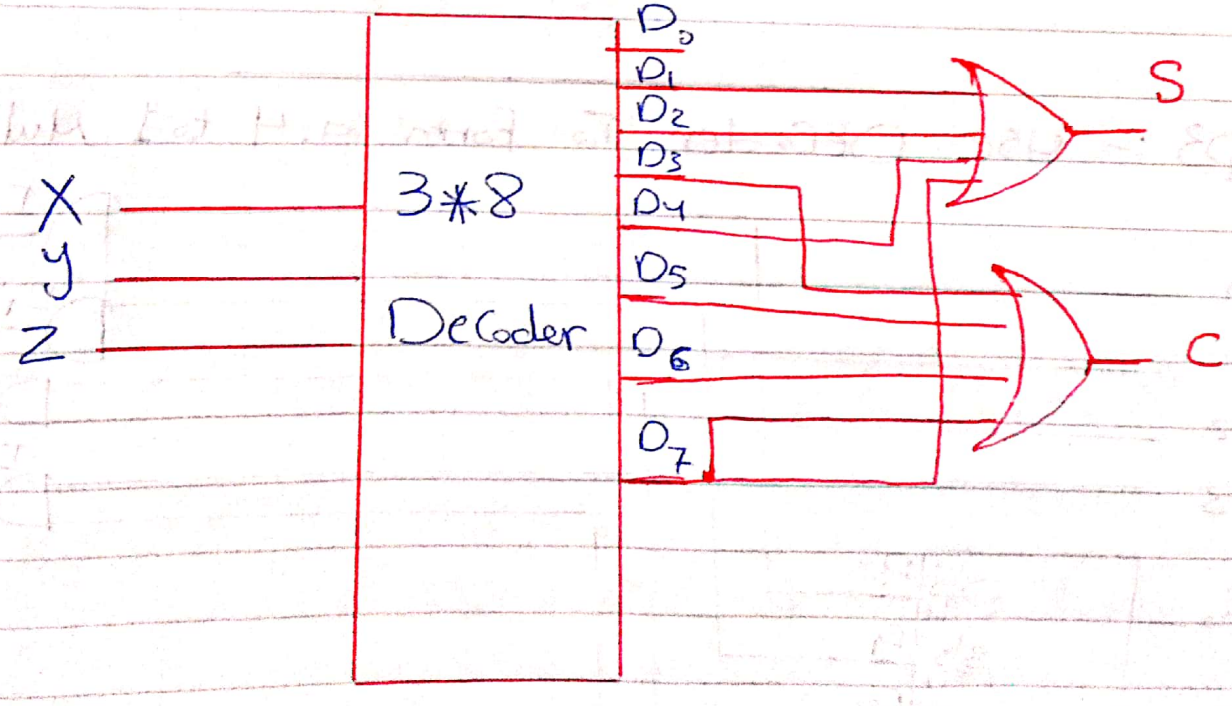
Q1 :- Design Full Adder using Decoder 3*8

Sol:- $S = x'y'z + x'yz' + xy'z' + xyz$

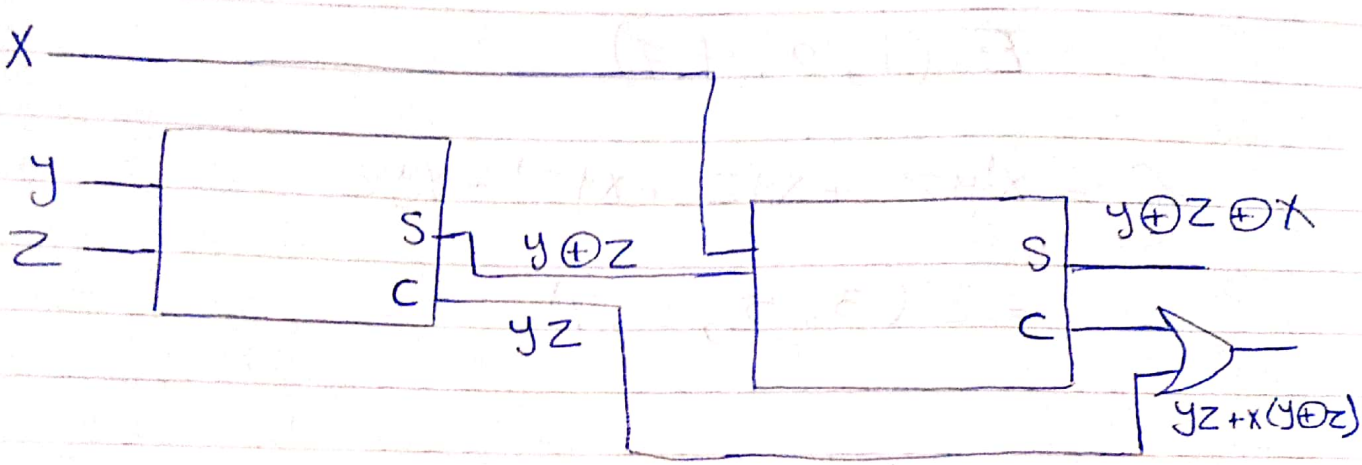
$= \Sigma(1, 2, 4, 7)$

$C = x'yz + xy'z + xyz' + xyz$

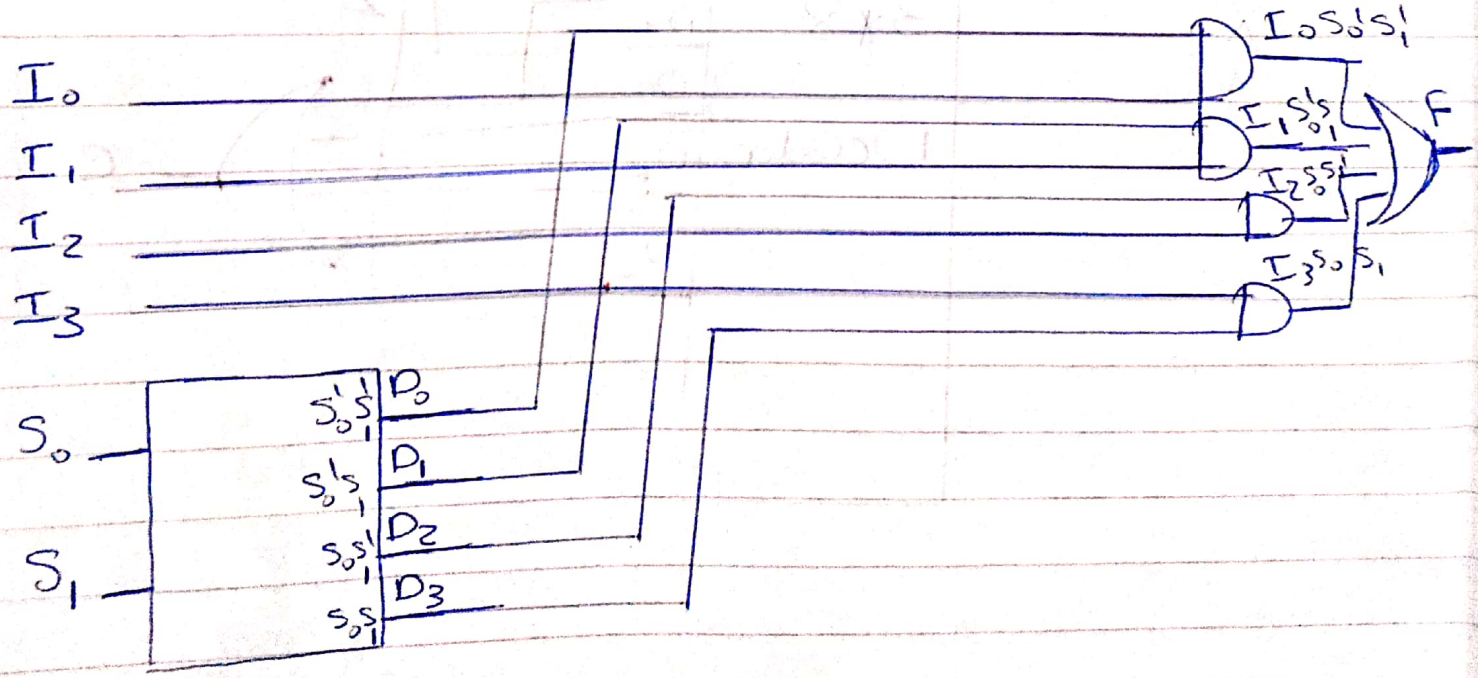
$= \Sigma(3, 5, 6, 7)$



Q2 :- Design Full Adder using half Adder.



Q3 :- Use Decoder To form a 4 to 1 Multiplexer



* معادلة الـ Multiplexer

$$F = I_0 S_0' S_1' + I_1 S_0' S_1 + I_2 S_0 S_1' + I_3 S_0 S_1$$

Q4:- Using a Decoder and external gates, design the Combinational Circuit defined the following three Boolean Function.

$$F_1 = x'yz' + xz$$

$$F_2 = xy'z' + x'y$$

$$F_3 = x'y'z' + xy$$

Soln:

$$F_1 = x'yz + xz(y+y')$$

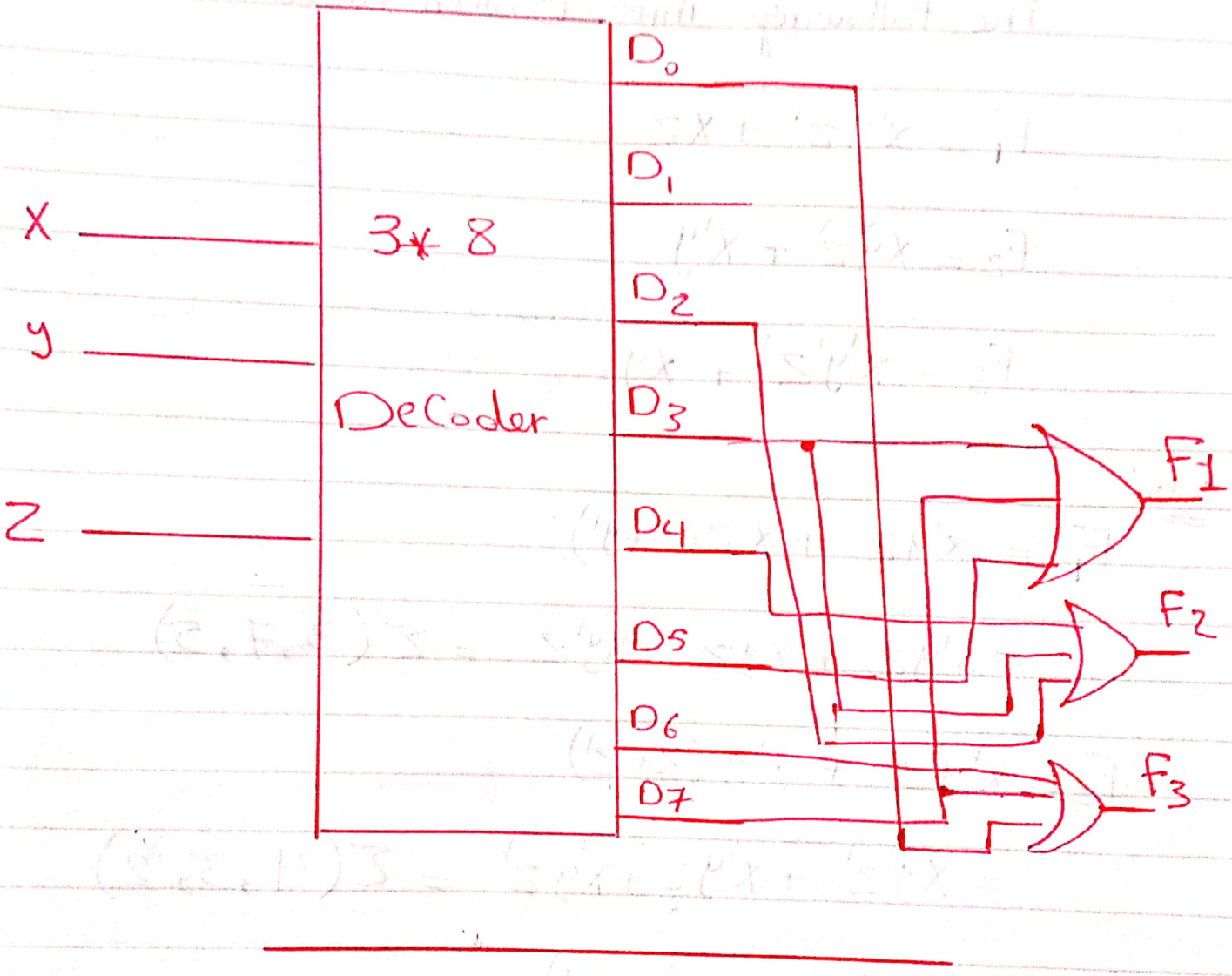
$$= x'yz + xyz + xy'z = \Sigma(3,7,5)$$

$$F_2 = xy'z' + x'y(z+z')$$

$$= xy'z' + x'yz + x'yz' = \Sigma(4,3,2)$$

$$F_3 = x'y'z' + xy(z+z')$$

$$= x'y'z' + xyz + xyz' = \Sigma(0,7,6)$$



Examples on sheet ch 3:-

3.2) a) $AB'C' + A'B'C' + A'BC' + A'B'C$

$= AB'C' + A'BC' + A'B'(C + C')$ (1)

$= AB'C' + A'BC' + A'B'$

$= AB'C' + A'(BC' + B')$

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

$= AB'C' + A'C' + A'B'$

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

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

$= A'B' + B'C' + A'C'$ //

b) $ABC + A'BC + AB'C + ABC' + AB'C' + A'BC' + A'B'C'$

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

$= AB + A'B + AB' + A'B'C'$

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

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

$= A + A'B + A'C'$ //

c) $A(A+B+C)(A'+B+C)(A+B'+C)(A+B+C')$

~~$= (A + AB + AC)(A' + B + C)($~~

$= (A + BB' + CC')(A+B+C)(A'+B+C)(A+B'+C)(A+B+C')$

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

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

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

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

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

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

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

$= AA' + AB + AC$

$= AB + AC$ #

3.9) a)

A	B	y	index	Minterm
0	0	1	m_0	$\bar{A}\bar{B}$
0	1	0	m_1	$\bar{A}B$
1	0	0	m_2	$A\bar{B}$
1	1	1	m_3	AB

$y = \Sigma(0,3)$

$= m_0 + m_3 = \bar{A}\bar{B} + AB$

b)

A	B	C	y	Minterms
0	0	0	0	m_0
0	0	1	0	m_1
0	1	0	0	m_2
0	1	1	(1)	$m_3 = \bar{A}BC$
1	0	0	0	m_4
1	0	1	(1)	$m_5 = A\bar{B}C$
1	1	0	(1)	$m_6 = AB\bar{C}$
1	1	1	(1)	$m_7 = ABC$

$$y = \Sigma(3,5,6,7)$$

$$= m_3 + m_5 + m_6 + m_7$$

$$= \bar{A}BC + A\bar{B}C + AB\bar{C} + ABC$$