



# Mid Term Exam

## Digital Design

Time Allowed: 75 minutes.

Dr: Ahmed Saleh

Total Marks: 30

BME Students.

2017 - 2018



Solve the following:

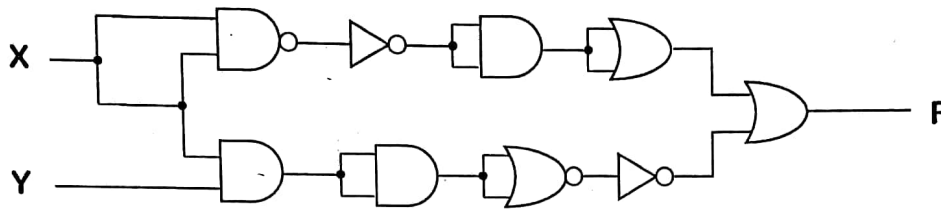
### Question 1: (16 Marks)

(A) Convert to Binary:

$(23.4)_{10}$  ,  $(AB.3)_{16}$  ,  $(75.2)_8$

(4 Marks)

(B) Find the truth table of the function (F) expressed by the following logic circuit;



(6 Marks)

(C) Implement (Draw) the following functions using:

(i) Using AND – NOT only.

(ii) Using OR – NOT only.

$$F = (A'BC' + ACD + A'B'C)BD'$$

(6 Marks)

### Question 2: (14 Marks)

(A) Find the Complement of the following function,  $F = B'D + A'BC' + ACD + A'BC$  (3 Marks)

(B) Using Equations:

(i) Simplify the following function:  $F(X,Y,Z) = XY + X'Z + YZ$

(ii) Express the function:  $F(A,B,C) = A + B'C$  in **Sum of minterms**, what are the corresponding Maxterms?

(iii) Express the function:  $F(A,B,C) = (A+B)(B'+C)$  in **Product of Maxterms**, what are the corresponding minterms?

(11 Marks)

----- End of Questions -----

With Best Wishes

*Dr: Ahmed Saleh*

*Plz, send feedback about the exam to:*

[aisaleh@yahoo.com](mailto:aisaleh@yahoo.com)

# Mid term Solution

Question (1)

(A) Convert to Binary

$$(51.312)_8 = 101001.011001)_2$$

$$(123.06)_{10} = 111101.00001)_2$$

B) Find the Result

$$\begin{array}{r} 5327_{16} \\ + 2245_{16} \\ \hline \end{array}$$

$$756C_{16}$$

$$\begin{array}{r} 4146_8 \\ - 1337_8 \\ \hline \end{array}$$

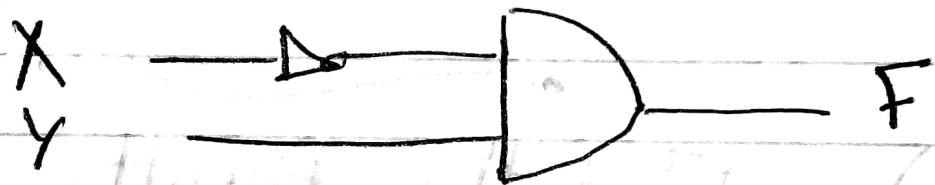
$$2607_8$$

$$(C) \quad F = (\bar{X} + Y\bar{X})(X + Y)$$

$$= \bar{X}X + X\bar{X}Y + \bar{X}Y + \bar{X}Y$$

$$= \bar{X}Y$$

\* Draw Logic Circuit



\* Truth table

X	Y	X	$\bar{X}Y$
0	0	1	0
0	1	1	1
1	0	0	0
1	1	0	0

## Question (2)

(A) Simplify the Following Func-

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

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

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

(B) Simplify using map:-

		C			
		D	0	1	1
A \ B	0 0	x	0	0	1
	0 1	x	x	1	1
	1 1	1	x	x	1
	1 0	1	0	0	1

$$F = B + \bar{D}$$