19400563
Zeyad Elganainy

Assignment 6

Q1

i. $(\bar{a}b) + (ac) + (ab\bar{c})$

ii.

a	b	c	$\bar{a}b$	ac	$ab\bar{c}$	$(\bar{a}b)+(ac)+(ab\bar{c})$
0	0	0	0	0	0	0
0	0	1	0	0	0	0
0	1	0	1	0	0	1
0	1	1	1	0	0	1
1	0	0	0	0	0	0
1	0	1	0	1	0	1
1	1	0	0	0	1	1
1	1	1	0	1	0	1

iii. Step ①: k-map for 3 variables :

A \ BC	00	01	11	10
0	m_0	m_1	m_3	m_2
1	m_4	m_5	m_7	m_6

Step ②: Write 1's into cells :

A \ BC	00	01	11	10
0	0	0	1	1
1	0	1	1	1

Step ③: Maximum grouping :

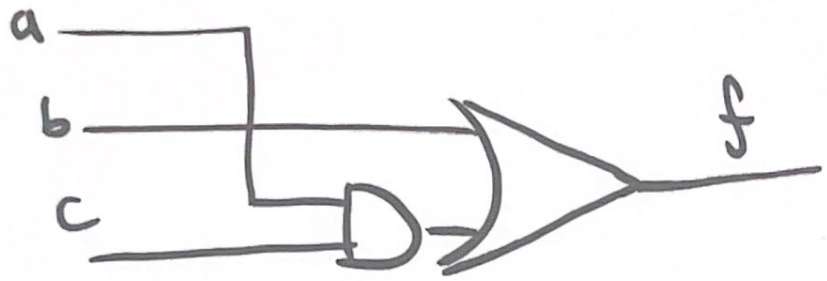
A \ BC	00	01	11	10
0	0	0	1	1
1	0	1	1	1

Step ④: B + AC

Q1

iii. continued.

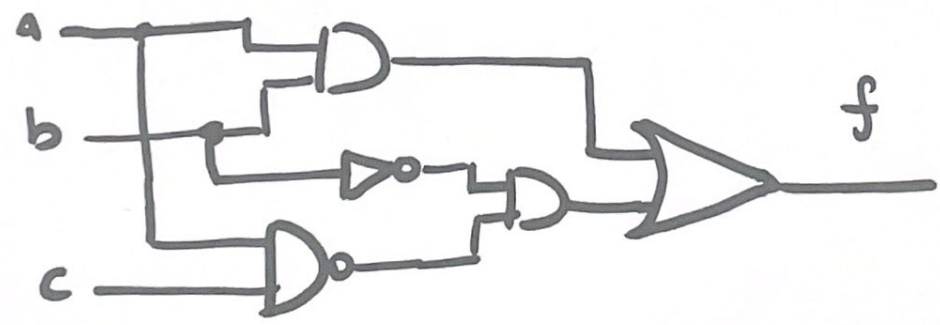
Drawing the circuit:



iv. The simplified one is better since it requires much less gates. ~~and is~~

Q2

i.



Q2

ii.

a	b	c	ab	$\overline{ac}$	$\overline{ac}\cdot\overline{b}$	$ab + \overline{ac}\cdot\overline{b}$
0	0	0	0	1	1	1
0	0	1	0	0	1	1
0	1	0	0	1	0	0
0	1	1	0	0	0	0
1	0	0	0	1	1	1
1	0	1	0	0	0	0
1	1	0	1	0	0	1
1	1	1	1	0	0	1

iii. The 1s we have in the output are:

m_0, m_1, m_4, m_6, m_7

$$f = (\bar{A}\cdot\bar{B}\cdot\bar{C}) + (\bar{A}\cdot\bar{B}\cdot C) + (A\cdot\bar{B}\cdot\bar{C}) + (A\cdot B\cdot\bar{C}) + (A\cdot B\cdot C)$$

Q3

In word document