Aisha Muhammad Nawaz
20L-0921
DLD SECTION 2E2 BSCS
LAB MANUAL 05

Question 1

(Truth Table) $F2 = [(A.(B+C') + (A'+C'))]'.C$

A	B	C	A'	B'	C'	F2
0	0	0	1	1	1	0
0	0	1	1	1	0	0
0	1	0	1	0	1	0
0	1	1	1	0	0	0
1	0	0	0	1	1	0
1	0	1	0	1	0	1
1	1	0	0	0	1	0
1	1	1	0	0	0	0

Q2 (i). $F(X,Y,Z) = \Sigma m(1,3,5,7)$

$= \Sigma m(0,2,4,6,8,9,10,11,12,13,14,15)$

(ii). $F(X,Y,Z) = \Pi M(0,2,4,6,8,9,10,11,12,13,14,15)$

(iii). $F(X,Y,Z) = \Sigma m(0,2,4,6,7)$

$= \Sigma m(1,3,5,8,9,10,11,12,13,14,15)$

$F(X,Y,Z) = \Pi M(1,3,5,8,9,10,11,12,13,14,15)$

(iii). $F(A,B,C) = \Sigma m(0,1,3,4,5,7)$

$= \Sigma m(2,6,8,9,10,11,12,13,14,15)$

$F(A,B,C) = \Pi M(2,6,8,9,10,11,12,13,14,15)$

Question 3 $F(A, B, C) = \Sigma m(0,2,3,4,6) + d(7)$

a) Truth Table

Index	A	B	C	Main term Boolean (SOP)	F
0	0	0	0	$\bar{A} \cdot \bar{B} \cdot \bar{C}$	1
1	0	0	1	$\bar{A} \cdot \bar{B} \cdot C$	0
2	0	1	0	$\bar{A} \cdot B \cdot \bar{C}$	1
3	0	1	1	$\bar{A} \cdot B \cdot C$	1
4	1	0	0	$A \cdot \bar{B} \cdot \bar{C}$	1
5	1	0	1	$A \cdot \bar{B} \cdot C$	0
6	1	1	0	$A \cdot B \cdot \bar{C}$	1
7	1	1	1	$A \cdot B \cdot C$	X

b) K-maps

	$\bar{B}\bar{C}$	$\bar{B}C$	BC	$B\bar{C}$
$\bar{A}$	m_0 1	m_1	m_3 1	m_2 1
A	m_4 1	m_5	m_7 X	m_6 1

$= \bar{C} + B$

Question 4:

$$F1(A, B, C, D) = \Sigma m(0, 2, 4, 6, 7, 8, 10, 12, 14, 15) + d(3, 11)$$

(a). Truth Table

Index	A	B	C	D	minterm(sop) Boolean expression	F
0	0	0	0	0	$\bar{A} \cdot \bar{B} \cdot \bar{C} \cdot \bar{D}$	1
1	0	0	0	1	$\bar{A} \cdot \bar{B} \cdot \bar{C} \cdot D$	0
2	0	0	1	0	$\bar{A} \cdot \bar{B} \cdot C \cdot \bar{D}$	1
3	0	0	1	1	$\bar{A} \cdot \bar{B} \cdot C \cdot D$	X
4	0	1	0	0	$\bar{A} \cdot B \cdot \bar{C} \cdot \bar{D}$	1
5	0	1	0	1	$\bar{A} \cdot B \cdot \bar{C} \cdot D$	0
6	0	1	1	0	$\bar{A} \cdot B \cdot C \cdot \bar{D}$	1
7	0	1	1	1	$\bar{A} \cdot B \cdot C \cdot D$	1
8	1	0	0	0	$A \cdot \bar{B} \cdot \bar{C} \cdot \bar{D}$	1
9	1	0	0	1	$A \cdot \bar{B} \cdot \bar{C} \cdot D$	0
10	1	0	1	0	$A \cdot \bar{B} \cdot C \cdot \bar{D}$	1
11	1	0	1	1	$A \cdot \bar{B} \cdot C \cdot D$	X
12	1	1	0	0	$A \cdot B \cdot \bar{C} \cdot \bar{D}$	1
13	1	1	0	1	$A \cdot B \cdot \bar{C} \cdot D$	0
14	1	1	1	0	$A \cdot B \cdot C \cdot \bar{D}$	1
15	1	1	1	1	$A \cdot B \cdot C \cdot D$	1

(b) : K-map

	$\bar{C}\bar{D}$	$\bar{C}D$	CD	$C\bar{D}$
$\bar{A}\bar{B}$	m_0 1	m_1	m_3 X	m_2 1
$\bar{A}B$	m_4 1	m_5	m_7 1	m_6 1
AB	m_{12} 1	m_{13}	m_{15} 1	m_{14} 1
$A\bar{B}$	m_8 1	m_9	m_{11} X	m_{10} 1

$F1 = C + \bar{D}$

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Aisha Muhammad Nawaz
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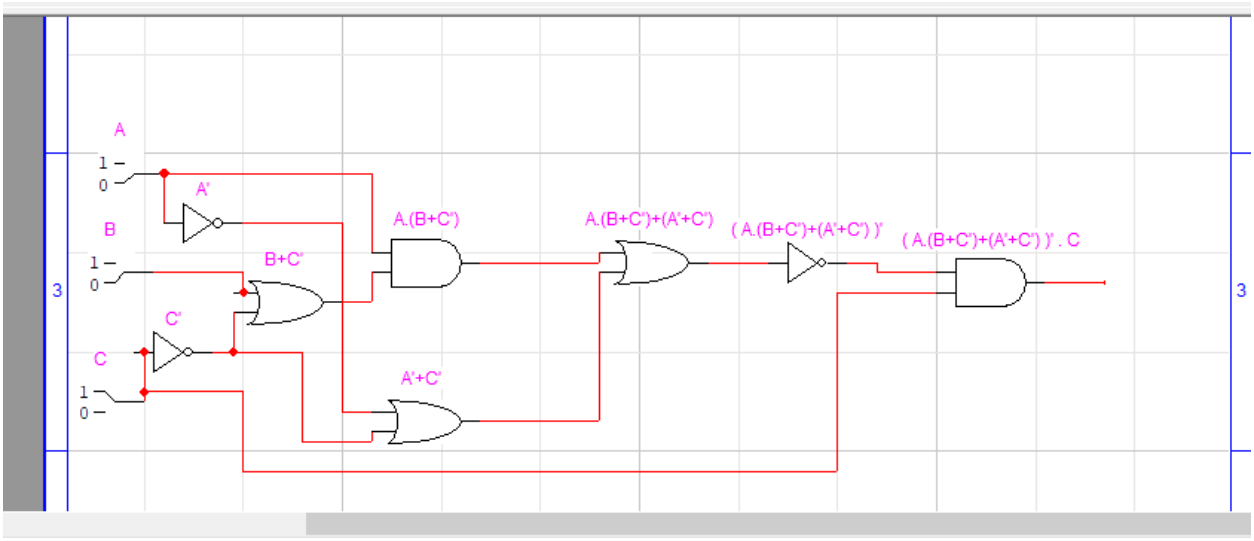
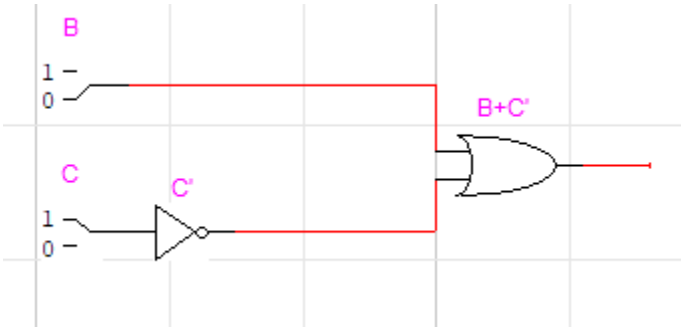
Question 1:



Question 3(b):



Question 4(b):