Name :- Muzamil

Roll no :- P20-0108

Assignment no:- 3

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Question # 1

Simplify

(a) $\bar{A}BC + \bar{A}B\bar{C} + A\bar{B}C + \bar{A}\bar{B}C$

Solution:

$\Rightarrow \bar{A}B\bar{C} + \bar{A}BC + A\bar{B}C + \bar{A}\bar{B}C$

$\Rightarrow \bar{A}\bar{C}(\bar{B}+B) + \bar{B}\bar{C}(A+\bar{A})$

$\Rightarrow \bar{A}\bar{C}(1) + \bar{B}\bar{C}(1)$

$\Rightarrow \bar{A}\bar{C} + \bar{B}\bar{C}$

$\Rightarrow \bar{C}(\bar{A}+\bar{B})$

Assignment #3

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Question #1

(a) $\bar{A}B\bar{C} + \bar{A}BC + A\bar{B}\bar{C} + \bar{A}B\bar{C}$

Solution.

Truth table before Simplification:

A	B	C	$\bar{A}$	$\bar{B}$	$\bar{C}$	$\bar{A}B\bar{C}$	$\bar{A}BC$	$A\bar{B}\bar{C}$	$\bar{A}B\bar{C}$	Output
0	0	0	1	1	1	1	0	0	1	1
0	0	1	1	1	0	0	0	0	0	0
0	1	0	1	0	1	0	1	0	0	1
0	1	1	1	0	0	0	0	0	0	0
1	0	0	0	1	1	0	0	1	0	1
1	0	1	0	1	0	0	0	0	0	0
1	1	0	0	0	1	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0

Question # 1 (5)

(b) Muzamil
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Truth table before Simplification

A	B	C	D	Output
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

Question #1

(b)

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Simplification

$= \bar{A}\bar{B}C + \bar{A}BC\bar{D} + \bar{A}C(\bar{A}BD)$

$= \bar{A}\bar{B}C + \bar{A}BC\bar{D} + \bar{A}C(\bar{A} + \bar{B} + \bar{D})$

$= A\bar{B}C + \bar{A}BC\bar{D} + \bar{A}C(A + \bar{B} + \bar{D})$

$= A\bar{B}C + \bar{A}BC\bar{D} + A\cdot\bar{A}C + \bar{A}\bar{B}C + \bar{A}C\bar{D}$

$A\bar{B}C + \bar{A}BC\bar{D} + 0 + \bar{A}\bar{B}C + \bar{A}C\bar{D}$

$= A\bar{B}C + \bar{A}\bar{B}C + \bar{A}BC\bar{D} + \bar{A}C\bar{D}$

$\bar{B}C(A + \bar{A}) + \bar{A}\bar{D}(B\bar{C} + C)$

$\bar{B}C + \bar{A}\bar{D}(1 + B)$

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

$\bar{B}C + \bar{A}\bar{D}B + \bar{A}\bar{D}C \rightarrow$ Answer

Truth table after Simplification

A	B	C	D	output
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

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Question # 2 (a)

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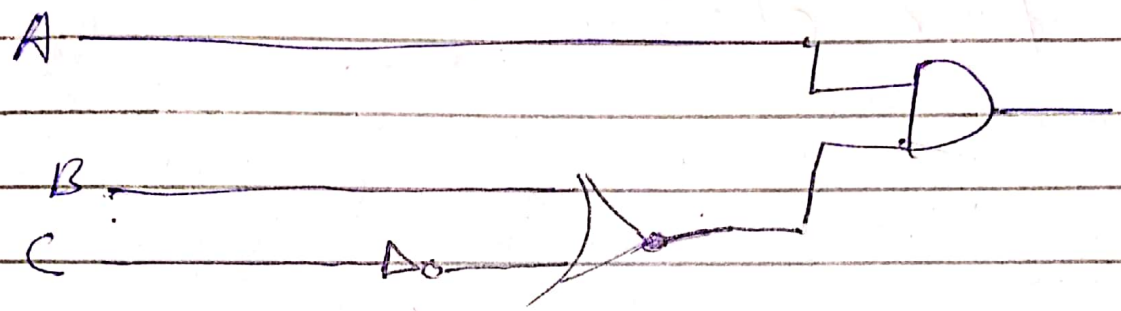
$\Rightarrow AB + ABC + A\bar{B}\bar{C} + A\bar{C}$

$\Rightarrow AB(1+C) + A\bar{C}(\bar{B}+1)$

$\Rightarrow AB + A\bar{C}$

$\Rightarrow A(B+\bar{C})$

logic Diagram



Question # 2 (b)

$\Rightarrow A\bar{A}\bar{C}\bar{B} + ABC$

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

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

$= (A \cdot A + AC)\bar{B} + ABC$

$= (A + AC)\bar{B} + ABC$

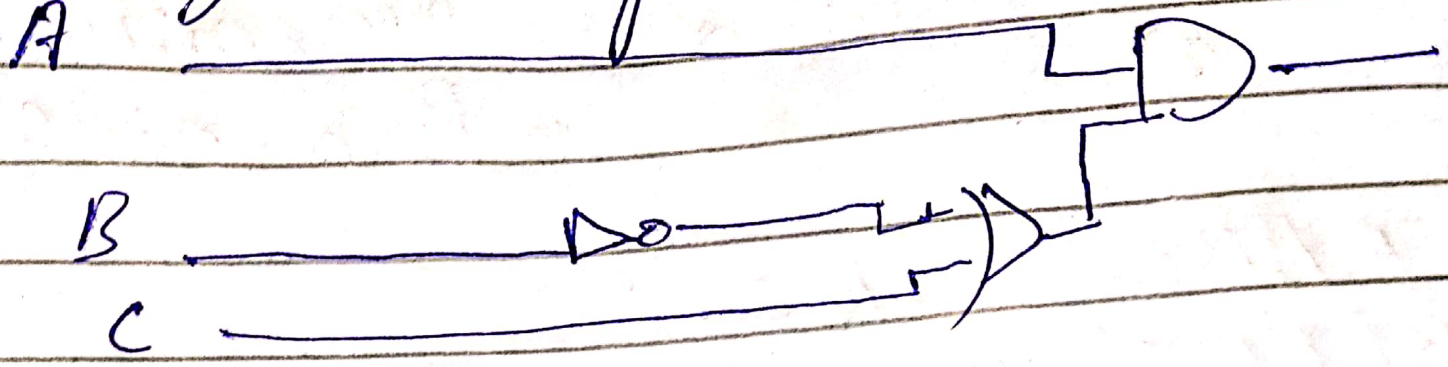
$= \bar{B}A + \bar{B}AC + ABC$

$= \bar{B}A + AC(\bar{B}+B)$

$= \bar{B}A + AC(1)$

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

Logic Diagram



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