

Homework # 5 - Karnaugh Map

Student's Name _____

Instruction:

- Show all work to receive full credit. Box or circle the answer

Use a Karnaugh map and Boolean algebra to simplify the following expression

1. $\bar{A}\bar{B}\bar{C} + A\bar{B}\bar{C} + A\bar{B}C + ABC + ABC$

<i>Karnaugh map</i> (12 points)	<i>Boolean algebra</i> (12 points)															
<table border="1" style="margin: auto; border-collapse: collapse;"><thead><tr><th style="width: 10%;"></th><th style="width: 15%; text-align: center;">\bar{C}</th><th style="width: 15%; text-align: center;">C</th></tr></thead><tbody><tr><th style="text-align: center;">$\bar{A}\bar{B}$</th><td style="width: 30%; height: 30px;"></td><td style="width: 30%; height: 30px;"></td></tr><tr><th style="text-align: center;">$\bar{A}B$</th><td style="width: 30%; height: 30px;"></td><td style="width: 30%; height: 30px;"></td></tr><tr><th style="text-align: center;">AB</th><td style="width: 30%; height: 30px;"></td><td style="width: 30%; height: 30px;"></td></tr><tr><th style="text-align: center;">$A\bar{B}$</th><td style="width: 30%; height: 30px;"></td><td style="width: 30%; height: 30px;"></td></tr></tbody></table>		\bar{C}	C	$\bar{A}\bar{B}$			$\bar{A}B$			AB			$A\bar{B}$			
	\bar{C}	C														
$\bar{A}\bar{B}$																
$\bar{A}B$																
AB																
$A\bar{B}$																

2. $\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}BC$

<i>Karnaugh map</i> (10 points)	<i>Boolean algebra</i> (10 points)															
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$\bar{A}\bar{B}$																
$\bar{A}B$																
AB																
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Use a Karnaugh map to simplify the following expression

3. $\bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}B\bar{C}D + \bar{A}BCD + \bar{A}BC\bar{D} + ABC\bar{D} + AB\bar{C}D + ABCD + A\bar{B}\bar{C}\bar{D} + A\bar{B}CD + A\bar{B}C\bar{D}$ (21 pts)

	$\bar{C}\bar{D}$	$\bar{C}D$	CD	$C\bar{D}$
$\bar{A}\bar{B}$				
$\bar{A}B$				
AB				
$A\bar{B}$				

4. $\bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + \bar{A}B\bar{C}\bar{D} + AB\bar{C}\bar{D} + ABC\bar{D} + ABCD + A\bar{B}\bar{C}\bar{D}$ (19 pts)

	$\bar{C}\bar{D}$	$\bar{C}D$	CD	$C\bar{D}$
$\bar{A}\bar{B}$				
$\bar{A}B$				
AB				
$A\bar{B}$				

5. $\bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + \bar{A}BCD + AB\bar{C}D + ABCD$ (16 pts)

	$\bar{C}\bar{D}$	$\bar{C}D$	CD	$C\bar{D}$
$\bar{A}\bar{B}$				
$\bar{A}B$				
AB				
$A\bar{B}$				

----- Homework 5 Ends Here -----