

Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
 COLLEGE OF COMPUTER STUDIES
 Isulan Campus, Isulan Sultan Kudarat

AT316 – Digital Design
Final Examination

Name : _____ Year /Section: _____ Score: _____

I. Multiple Choice (Write the correct letter in the space provided before the number)

- _____ 1. Which of the following is an example of minterms?
 a. $x'yz + xy'z + x(y+z)$ b. $xy + y(xy+z)$ c. $xyz + x'y'z + x'yz'$ d. $(x+1)(x+y+z)(x'+y)$
- _____ 2. Which of the following is an example of minterms?
 a. $x'yz + xy'z + x(x+y+z)$ b. $xy + xyz + xyz'$ c. $xyz + x'y'z + x'(y+z')$ d. $(x+1)(x+y+z)(x'+y)$
- _____ 3. Minterms is express of?
 a. Sum of all sums b. product of sums c. sum of products d. product of all products
- _____ 4. Maxterms is express of?
 a. Sum of all sums b. product of sums c. sum of products d. product of all products
- _____ 5. What is the equivalent value of the function? $f_2 = xyz + xyz + xyz + xyz$
 a. $f_2 = m_3 + m_5 + m_6 + m_7$ b. $f_2 = m_2 + m_5 + m_6 + m_7$ c. $f_2 = m_3 + m_4 + m_6 + m_7$ d. $f_2 = m_3 + m_5 + m_6$
- _____ 6. Express the Boolean function $F = A + BC$ as a sum of minterms. The function has three variables: A, B, and C. The first term A is missing two variables.
 1. $ABC + ABC' + AB'C + AB'C'$ c. $ABC + ABC' + AB'C + AB'C$
 2. $ABC + AB'C' + AB'C + AB'C$ d. $ABC + ABC' + A'B'C + AB'C$
- _____ 7. Express the Boolean function $F = xy + xz$ as a product of maxterms.
 1. $(x' + y)(x + z)(y + z)$ c. $(x + y)(x + z)(y + z)$
 2. $(x' + y)(x + z)(y' + z)$ d. $(x' + y)(x + z)(y + z')$
- _____ 8. What is the equivalent of m_1 ?
 1. xyz b. $x'yz$ c. $x'y'z$ d. xyz'
- _____ 9. What is the equivalent of M_2
 1. $(x+y+z)$ b. $(x'+y'+z)$ c. $(x'+y+z')$ d. $(x+y'+z)$
- _____ 10. What is the equivalent of m_2 m_4
 1. $x'yz' + xy'z'$ b. $x'yz' + xyz'$ c. $x'yz' + x'y'z'$ d. $x'yz' + x'yz$

II. (Illustration) Draw the truth table and the symbols stated in the diagram. (2pts each) (11-18)

NAND	<div></div>	$F = (xy)'$	<table><tr><th>x</th><th>y</th><th>F</th></tr><tr><td>0</td><td>0</td><td></td></tr><tr><td>0</td><td>1</td><td></td></tr><tr><td>1</td><td>0</td><td></td></tr><tr><td>1</td><td>1</td><td></td></tr></table>	x	y	F	0	0		0	1		1	0		1	1	
x	y	F																
0	0																	
0	1																	
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Exclusive-OR (XOR)	<div></div>	$F = xy' + x'y$ $= x \oplus y$	<table><tr><th>x</th><th>y</th><th>F</th></tr><tr><td>0</td><td>0</td><td></td></tr><tr><td>0</td><td>1</td><td></td></tr><tr><td>1</td><td>0</td><td></td></tr><tr><td>1</td><td>1</td><td></td></tr></table>	x	y	F	0	0		0	1		1	0		1	1	
x	y	F																
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NOR	<div></div>	$F = (x + y)'$	<table><tr><th>x</th><th>y</th><th>F</th></tr><tr><td>0</td><td>0</td><td></td></tr><tr><td>0</td><td>1</td><td></td></tr><tr><td>1</td><td>0</td><td></td></tr><tr><td>1</td><td>1</td><td></td></tr></table>	x	y	F	0	0		0	1		1	0		1	1	
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Exclusive-NOR or equivalence	<div></div>	$F = xy + x'y'$ $= (x \oplus y)'$	<table><tr><th>x</th><th>y</th><th>F</th></tr><tr><td>0</td><td>0</td><td></td></tr><tr><td>0</td><td>1</td><td></td></tr><tr><td>1</td><td>0</td><td></td></tr><tr><td>1</td><td>1</td><td></td></tr></table>	x	y	F	0	0		0	1		1	0		1	1	
x	y	F																
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III. (Illustration) Draw the circuits diagram of the following Boolean expression. (2pts each)

19. $x'yz + x + z'$
20. $z(x'+y')$
21. $xy + y(x'+yz)$
22. $xyz + x'y + yz'$
23. $AB + BC' + B'C$

- IV. (Computation) Simplify the following Boolean function into simplest form using K Map. (2 point for correct grouping of KMap and 2 points for simplified Boolean expression) (28 pts)
- 24. $F(x,y)=\Sigma(1,2,3)$
 - 25. $F(A,B,C)=\Sigma(0,2,4,6)$
 - 26. $F(A,B,C)=\Sigma(1,3,4,6)$
 - 27. $F(x,y,z)=\Sigma(1,3,4,6)$
 - 28. $F= x'yz + x'y'z + xy'z + xyz'$
 - 29. $F= x'y'z' + x'y'z + x'y'z + x'yz'$
 - 30. $F(A,B,C,D)=\Sigma(0,1,2,3,4,5,8,9,10,12,13)$

Prepared By:

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Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
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Course Number/Description: CS 118 – Digital Design

Term: Final Exam

Semester: 1st Semester

Prepared by: ZIUS D. APRESTO

Date Submitted:

TABLE OF SPECIFICATIONS

Topics/Content	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	No. of Item	Score
Boolean Functions Minterms and Maxterms				10(1-10)	16(11-18)		26	26
Boolean Algebra and Logic Gates Truth Table and Map Method				10(19-23)	28(24-30)		38	38
Total No. of Items	3			20	44		64	
Total Score	3			20	44			64

Summary:

	No. of Points
Test I:	10
Test II:	16
Test III:	10
Test IV	28
Total Score	64

Checked by: _____

Date: _____