

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? $f_2 = xyz + xzy + xyz+ xyz$
a. $f_2=m3+m5+m6+m7$ b. $f_2=m2+m5+m6+m7$ c. $f_2=m3+m4+m6+m$ d. $f_2=m3+m5+m6$
- _____ 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 	$F = (xy)'$ <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>y</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table>	x	y	F	0	0	1	0	1	1	1	0	1	1	1	0	Exclusive-OR (XOR) 	$F = xy' + x'y$ $= x \oplus y$ <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>y</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>1</td> <td>0</td> </tr> </tbody> </table>	x	y	F	0	0	0	0	1	1	1	0	1	1	1	0
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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:

ZIUS D. APRESTO, MIT
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Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
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 Isulan Campus, Isulan, Sultan Kudarat

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				10(1-10)	16(11-18)		26	26
Minterms and Maxterms								
Boolean Algebra and Logic Gates				10(19-23)	28(24-30)		38	38
Truth Table and Map Method								
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: _____