

**Information Technology**

Instructor: Dr. G.E. Antoniou

Day, Month, Year

Day

Department of CSIT

Assessment

Module-3

Rana, Karan

1. Simplify, using algebraic manipulations, the following Boolean expression to a mini-

mum number of terms and factors.

• XY Z + Y + XY

= XY Z + Y + XY

= XY(Z + ) + Y

=XY + Y

=Y(X+) = Y

2. Simplify, using algebraic manipulations, the following Boolean expression to a mini-

mum number of terms and factors.

• ( + Y )( + Y )

= ( + Y )( + Y )

=( + ) ( + Y)

= + + Y + Y

=(1 + + Y)

=

3. Find the complement and simplify the following expression, to a minimum number of

terms and factors.

• X + Y

=() ()

=( + )( +)

= X+ Y ( + )

=X\* + X + Y + Y \*

=XY +

4. Find the complement and simplify the following expression, to a minimum number of

terms and factors.

• +

=( + ) ( + )

=(+) (X+Y)

=X\*X+X+Y+Y

=X+Y

5. Using DeMorgan’s Theorem, simplify the following expression, to a minimum number of terms and factors.

• F = + A + B

=(A+A) + AB

=BAB

6. Using DeMorgan’s Theorem, simplify the following expression, to a minimum number of terms and factors.

• F = ABC + CD + CE

=AB(C+C) + D +CE

=AB + D + CE

7. Simplify the following expression by means of a three–variable K–Map, to a minimum

number of terms and factors.

• XY + Y +

=XY(Z+Z) + Y(X+X)+XYZ

=XY+Y+XYZ

=Y+Z

8. Simplify the following expression by means of a four–variable K–Map, to a minimum

number of terms and factors.

• D + BD + C + AD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CD/AB** | **00** | **01** | **11** | **10** |
| **00** | 0000 | 0001 | 0011 | 0010 |
| **01** | 0100 | 0101 | 0101 | 0110 |
| **11** | 1100 | 1101 | 1111 | 1110 |
| **10** | 1000 | 1001 | 1011 | 1010 |

9. Simplify the following expression by means of a four–variable K–Map, to a minimum

number of terms and factors.

• ABC + CD + BD + C

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CD/AB** | **00** | **01** | **11** | **10** |
| **00** | 0000 | 0001 | 0011 | 0010 |
| **01** | 0100 | 0101 | 0111 | 0110 |
| **11** | 1100 | 1101 | 1111 | 1110 |
| **10** | 1000 | 1001 | 1011 | 1010 |

10. Simplify the following expression by means of a four–variable K–Map, to a minimum

number of terms and factors.

• ABC + CD + BD + C, with don’t care condition: x = ABCD

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **AB/CD** | **00** | **01** | **11** | **10** |
| **00** | 0000 | 0001 | 0011 | 0010 |
| **01** | 0100 | 0101 | 0111 | 0110 |
| **11** | 1100 | 1101 | 1111 | 1110 |
| **10** | 1000 | 1001 | 1011 | 1010 |