INFORMATION TECHNOLOGY

UNIVERSITY OF MUHAMMADIYAH SURAKARTA

DIGITAL SYSTEMS

6th PRACTICE

By:

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Experiment 1

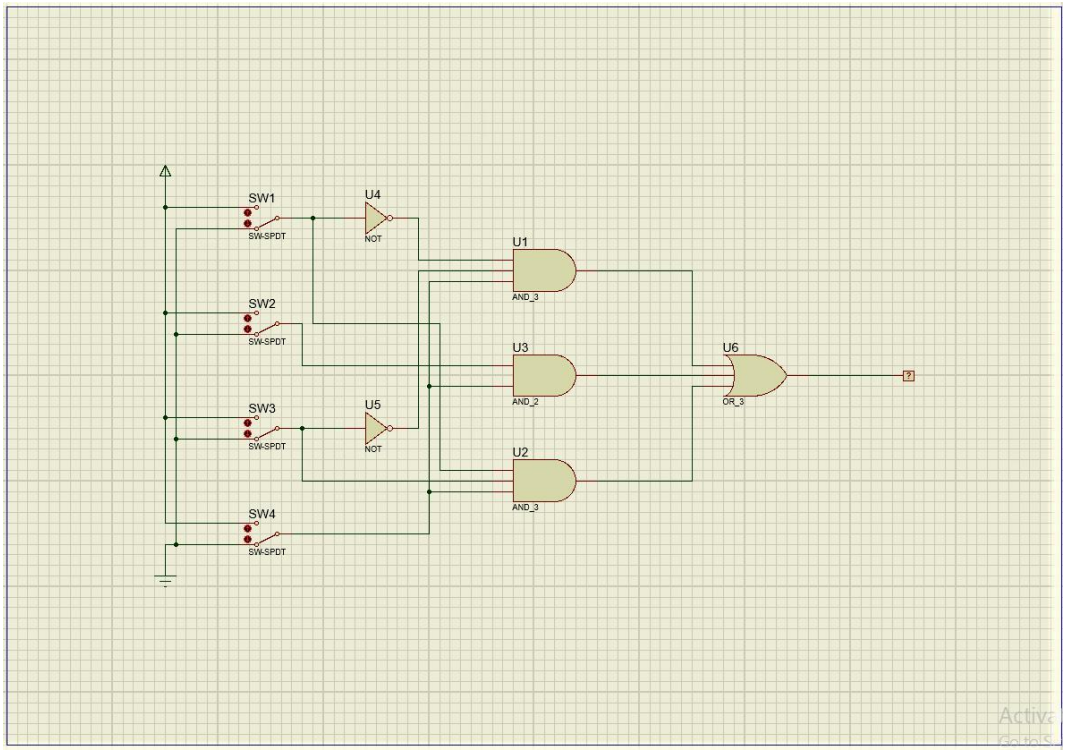
1. Karnaugh map

		AB			
		00	**01**	**11**	**10**
CD	**00**	0	0	0	0
	01	1	1	1	0
	11	0	1	1	1
	10	0	0	0	0

2. Boolean function

   F = A’C’D + BD + ACD

3. Logic gate combination



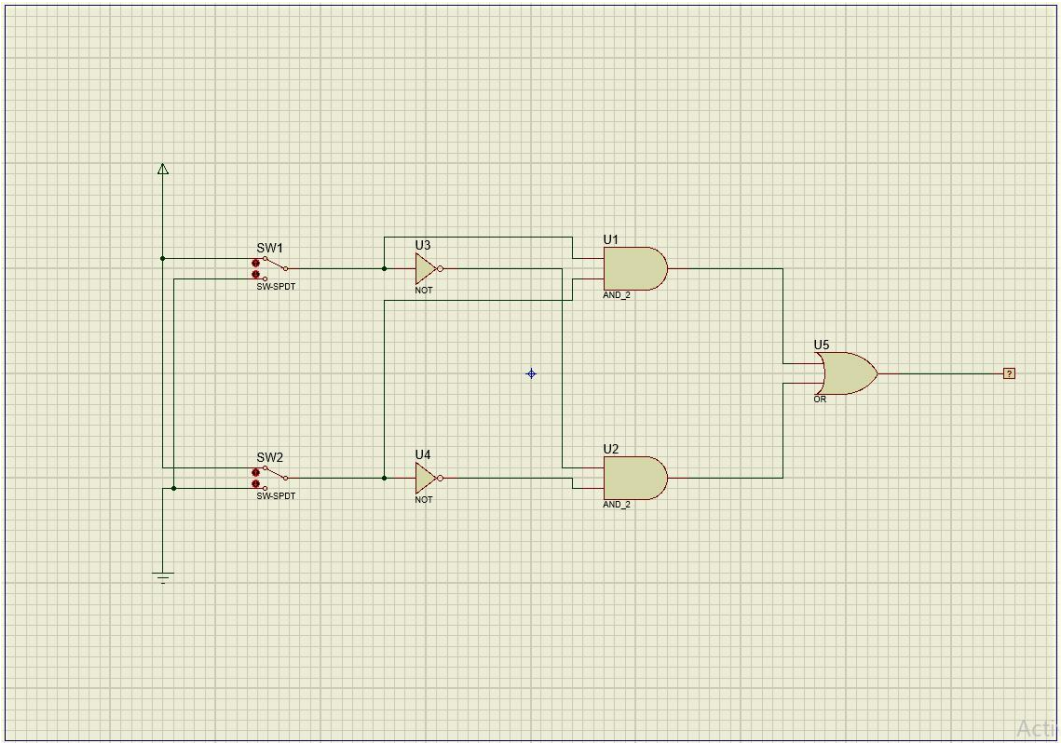
Picture 1.1. Logic gate combination based on boolean function

Experiment 2

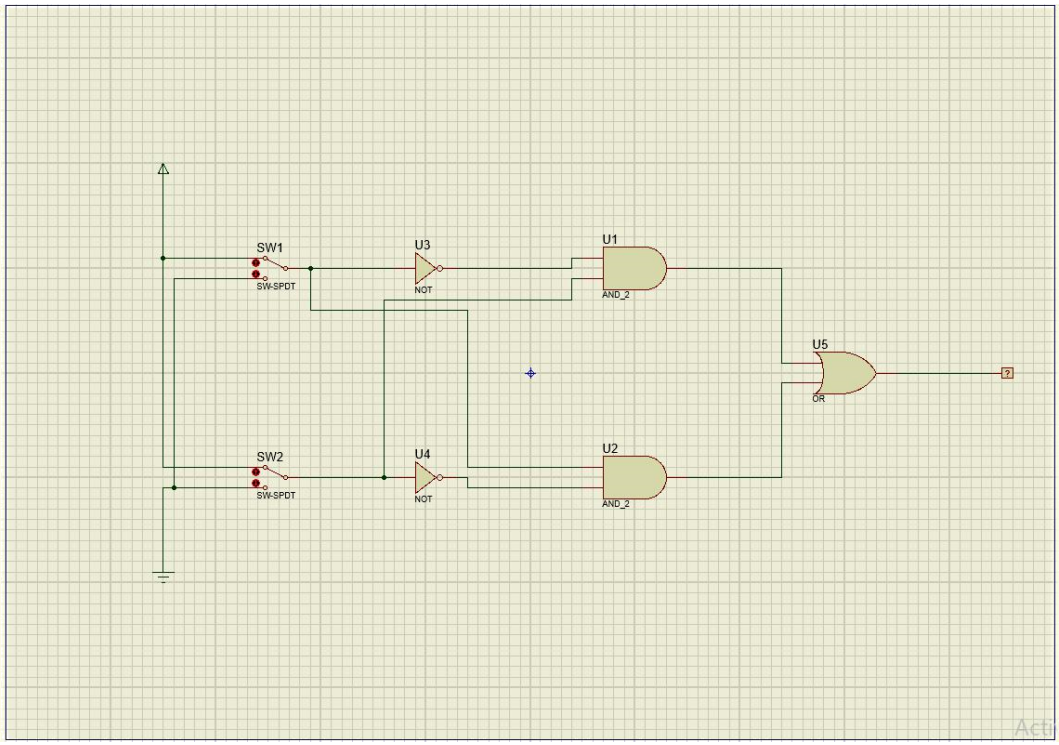
1. Karnaugh map

		AB			
		00	**01**	**11**	**10**
CD	**00**	1	0	0	1
	01	0	1	1	0
	11	0	1	1	0
	10	1	0	0	1

2. Boolean Function
    a. F = BD + B'D' (AND-OR)
    b. F = B'D + BD' (OR-AND)
3. Logic gate combination



Picture 2.1. Logic gate combination based on boolean function (AND-OR)



Picture 2.2. Logic gate combination based on boolean function (OR-AND)

Experiment 3

1. Boolean Function

   F = XYZ + XYZ’ + XY’Z + X’YZ + X’YZ’ + XY’Z’ + X’Y’Z’

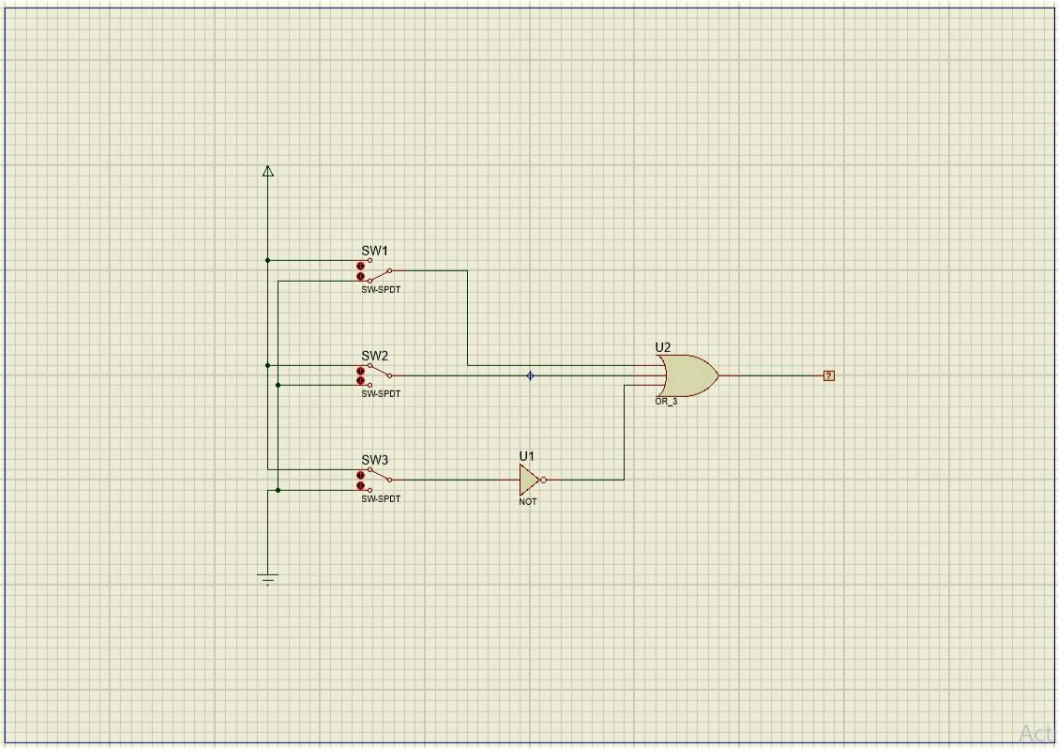
2. Karnaugh map

		XY			
		00	**01**	**11**	**10**
Z	**0**	1	1	1	1
	1	0	1	1	1

3. Simplification of boolean function

   F = Z’ + Y + X

4. Logic gate combination



Picture 3.1. Logic gate combination based on simplification of boolean function

Experiment 4

1. Boolean function

   F = AD’ + ABC + ABC’ + BCD + BC’D’ + AB’CD’

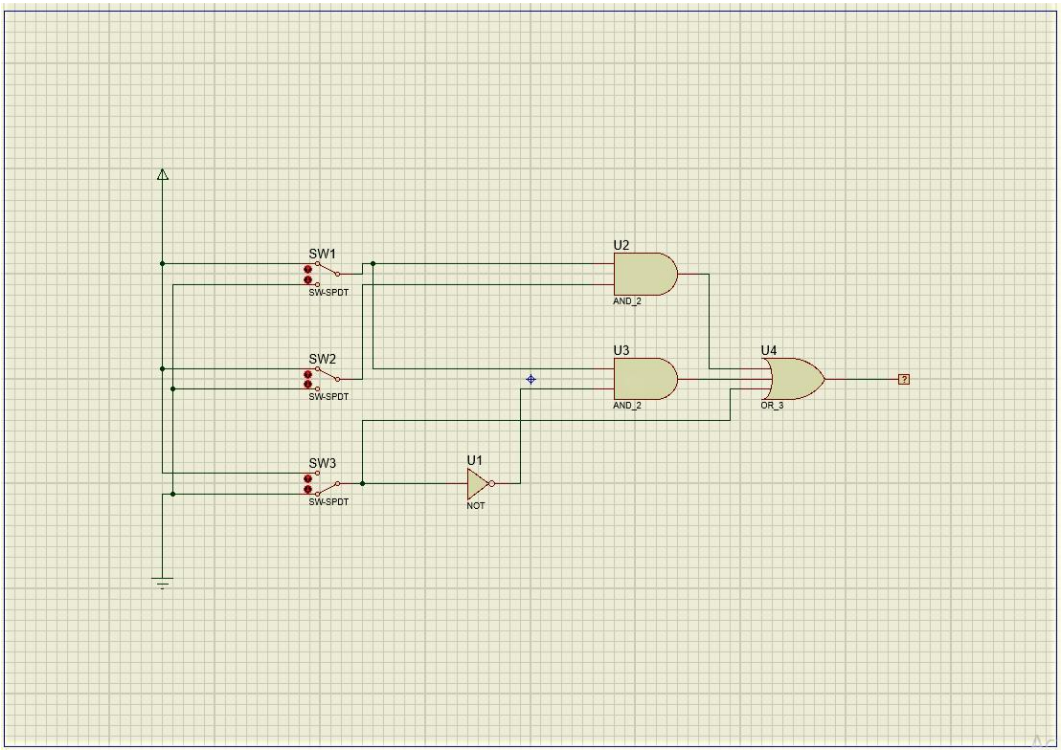
2. Karnaugh map

		AB			
		00	**01**	**11**	**10**
CD	**00**	0	1	1	1
	01	0	0	1	0
	11	0	1	1	0
	10	0	0	1	1

3. Simplification of boolean function

   F = AB + AD’+ B

4. Logic gate combination



Picture 4.1. Logic gate combination based on simplification of bolean function

Experiment 5

1. Table of boolean function

A	**B**	**C**	**D**	**F**
0	0	0	0	1
1	0	0	0	0
0	1	0	0	0
1	1	0	0	1
0	0	1	0	1
1	0	1	0	1
0	1	1	0	0
1	1	1	0	0
0	0	0	1	1
1	0	0	1	1
0	1	0	1	0
1	1	0	1	1
0	0	1	1	1
1	0	1	1	0
0	1	1	1	1
1	1	1	1	0

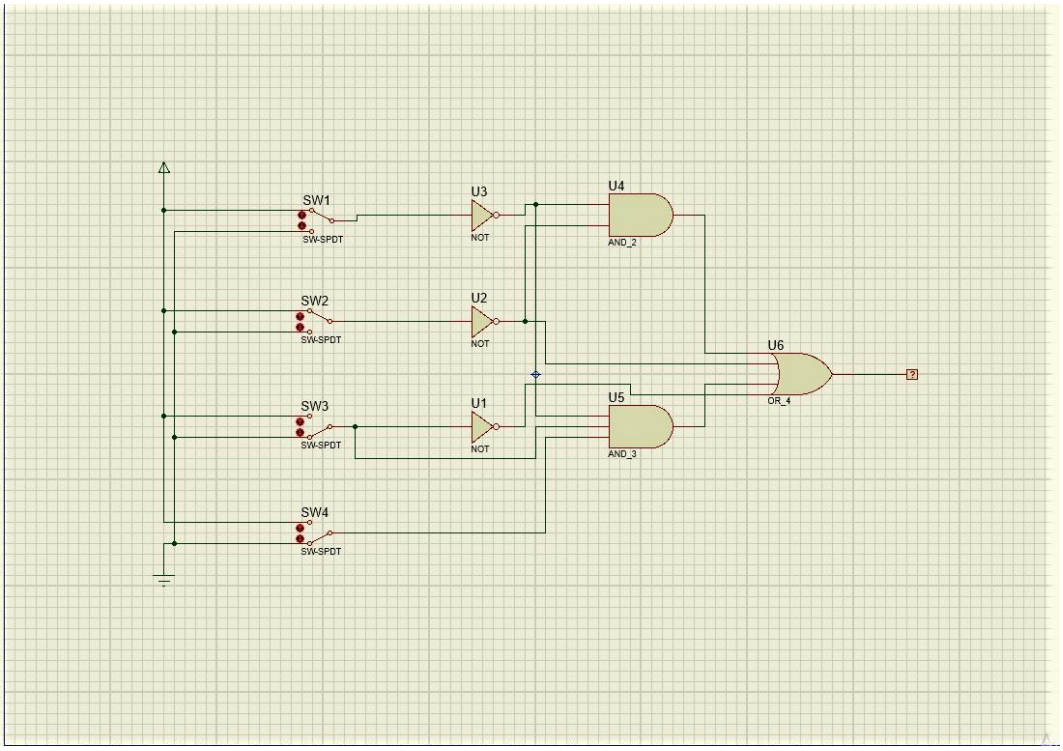
2. Karnaugh Map

		AB			
		00	**01**	**11**	**10**
CD	**00**	1	0	1	0
	01	1	0	1	1
	11	1	1	0	0
	10	1	0	0	1

3. Simplification of boolean function

F = A’B’ + B’ + A’CD + C’

4. Logic gate combination



Picture 5.1. Logic gate combination based on simplification of boolean function