

**DIGITAL SYSTEMS**

**PRAKTIKUM 5**



**By:**

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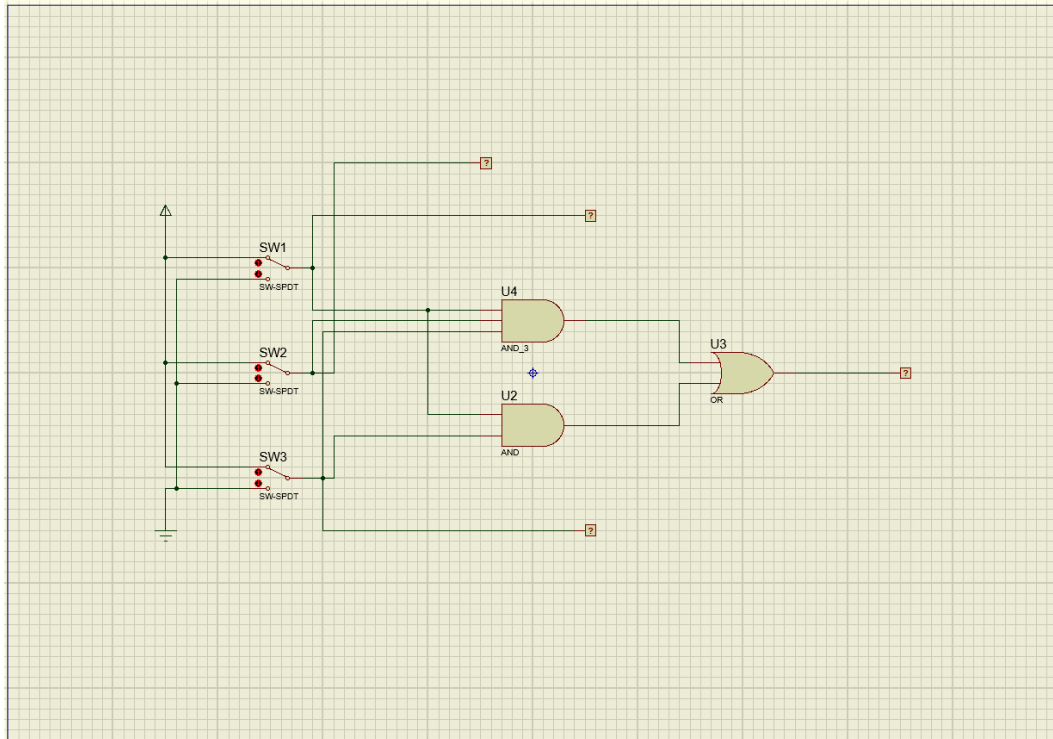
**NIM: L200183177**

**INFORMATION TECHNOLOGY**

**FACULTY OF COMMUNICATION AND INFORMATICS**

**UNIVERSITY OF MUHAMMADIYAH SURAKARTA**

## Experiment 1



Picture 1.1. Logic gate combination

### 1. Boolean functions

$$F = ABC + AC$$

### 2. Truth table

A	B	C	F
0	0	0	0
1	0	0	0
0	1	0	0
1	1	0	0
0	0	1	0
1	0	1	1
0	1	1	0
1	1	1	1

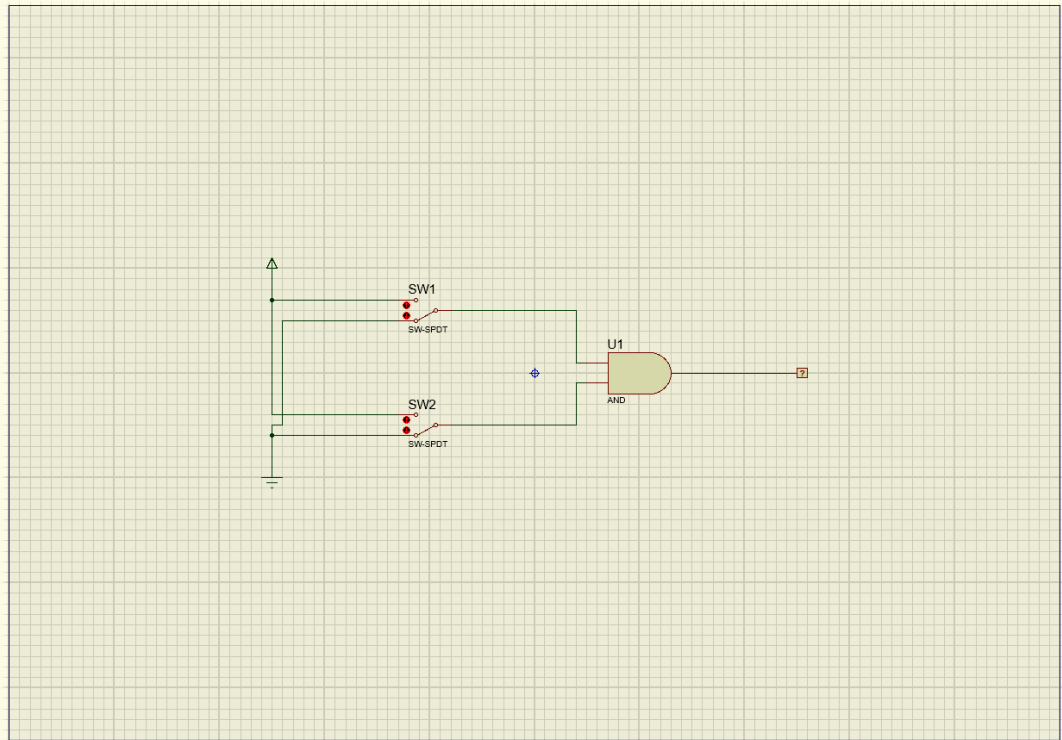
### 3. Karnaugh map

		AB			
		00	01	11	10
C	0	0	0	0	0
	1	0	0	1	1

### 4. Boolean functions based on karnaugh map

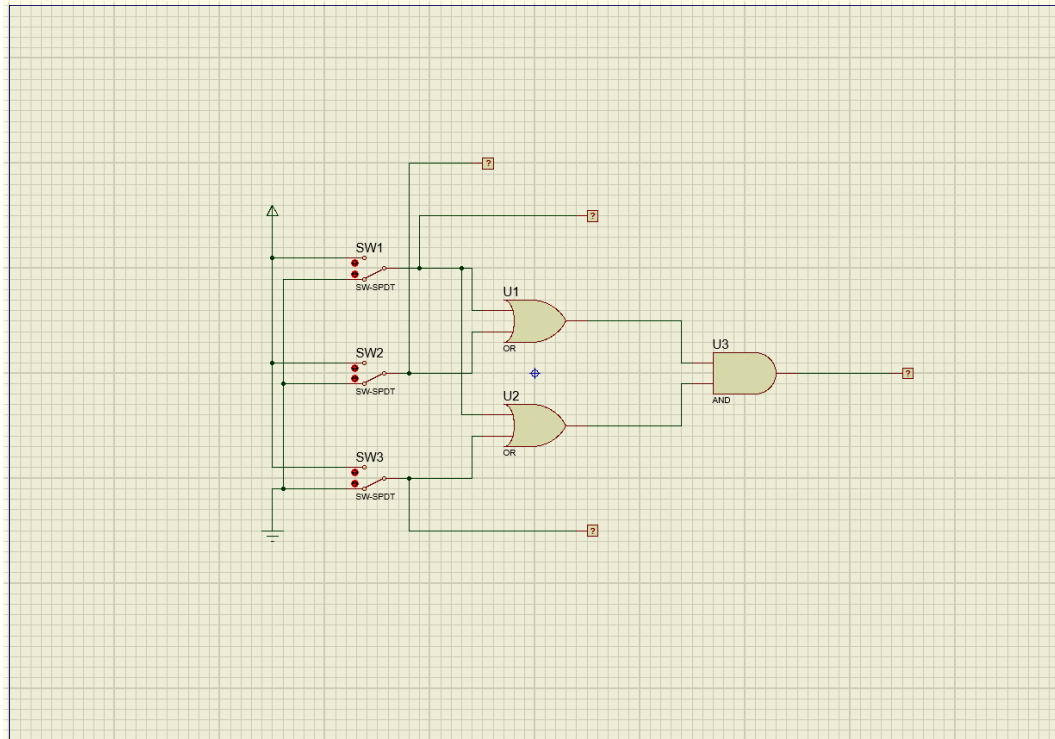
$$F = AC$$

5. Logic gate combination based on new boolean functions



Picture 1.2. New logic gate combination

## Experiment 2



Picture 2.1. Logic gate combination

### 1. Boolean functions

$$F = ABC + AC$$

### 2. Truth table

A	B	C	F
0	0	0	0
1	0	0	1
0	1	0	0
1	1	0	1
0	0	1	0
1	0	1	1
0	1	1	1
1	1	1	1

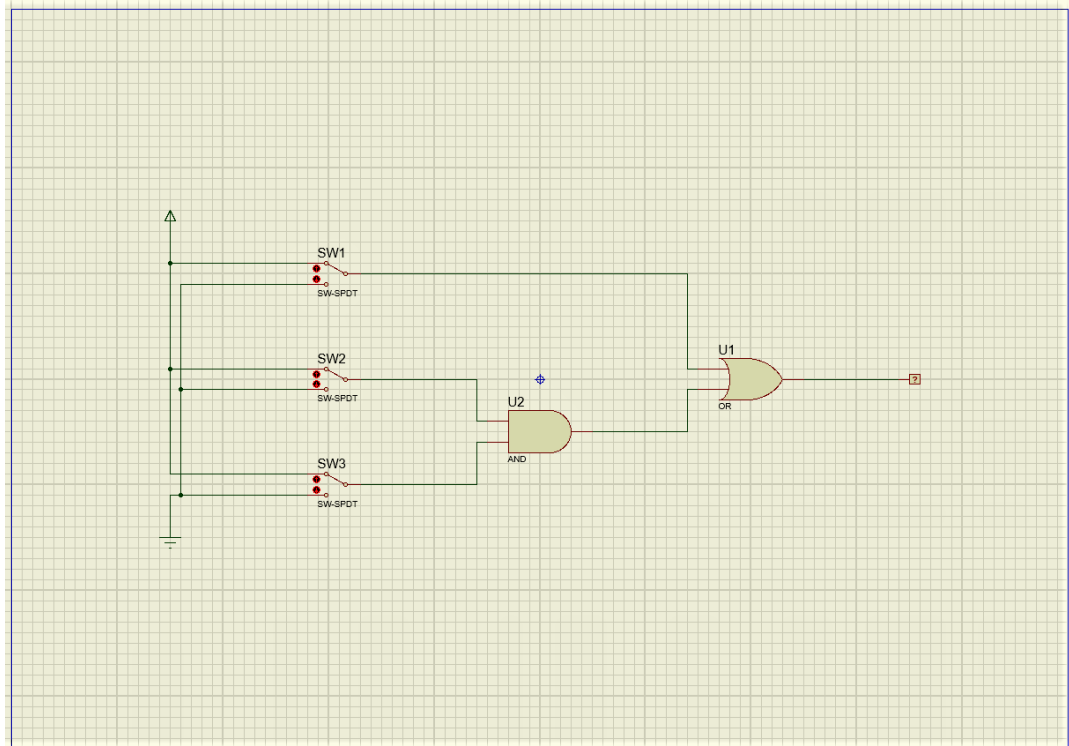
### 3. Karnaugh map

		AB			
		00	01	11	10
C	0	0	0	1	1
	1	0	1	1	1

### 4. Boolean functions based on karnaugh map

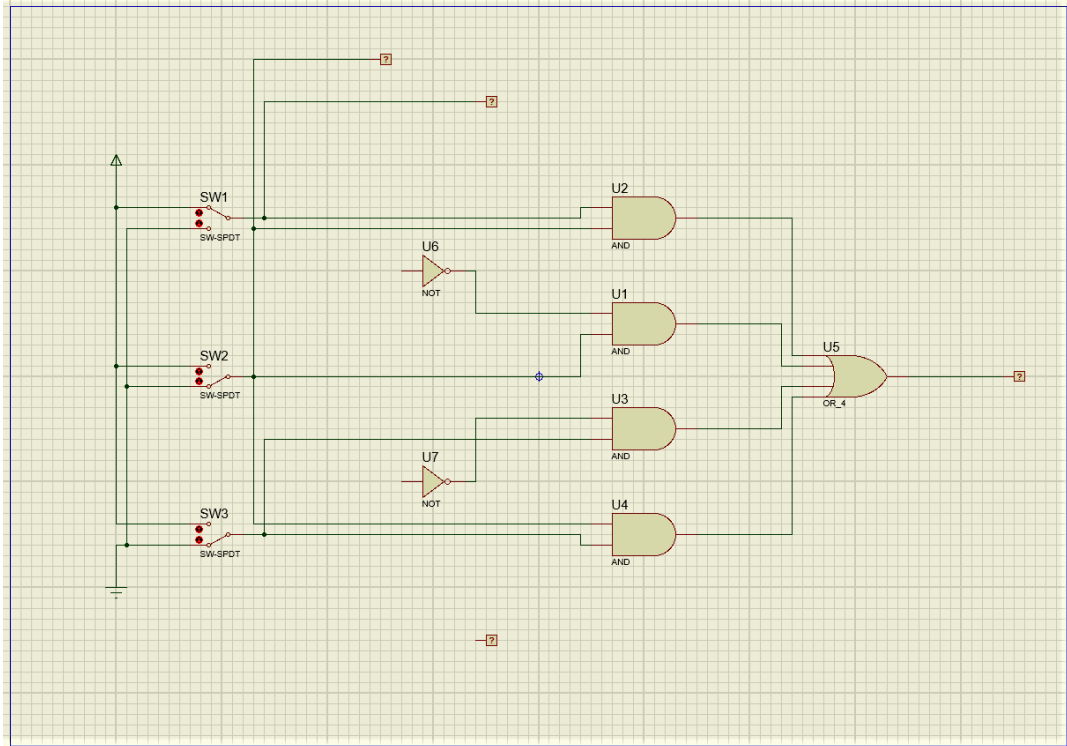
$$A+BC$$

5. Logic gate combination based on new boolean functions



Picture 2.2. New logic gate combination

### Experiment 3



Picture 3.1. Logic gate combination

#### 1. Boolean function

$$F = AB + A'B + B'C + BC$$

#### 2. Truth table

A	B	C	F
0	0	0	0
1	0	0	0
0	1	0	1
1	1	0	1
0	0	1	1
1	0	1	1
0	1	1	1
1	1	1	1

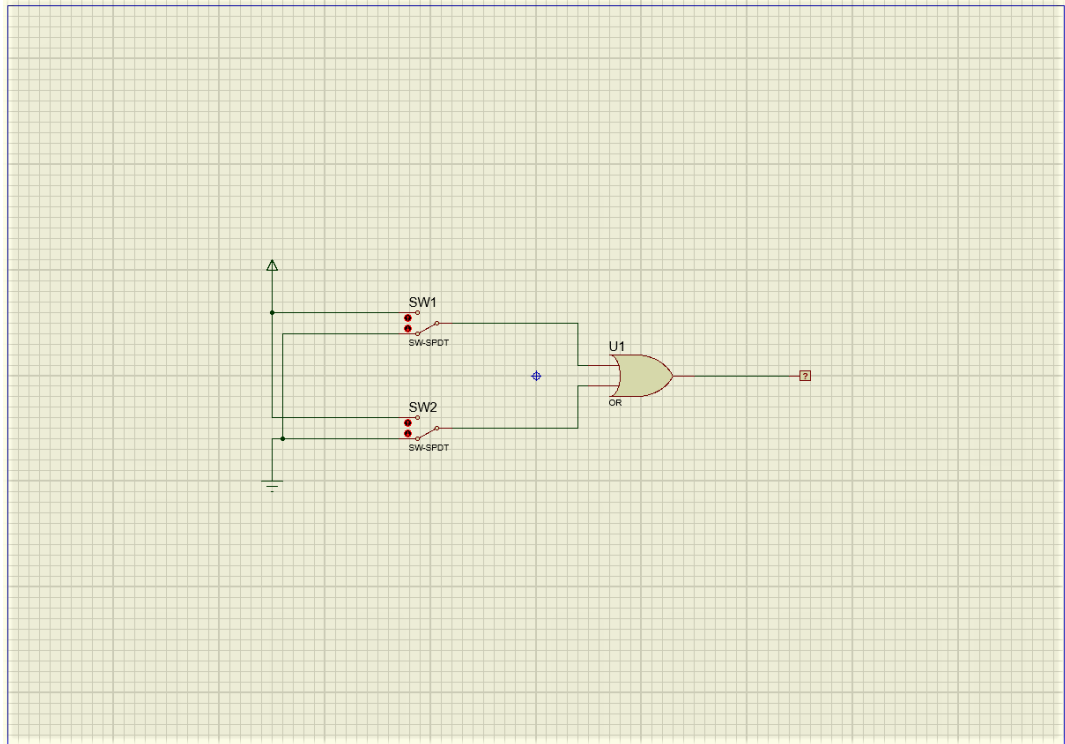
#### 3. Karnaugh map

		AB			
		00	01	11	10
C	0	0	1	1	0
	1	1	1	1	1

#### 4. Boolean functions based on karnaugh map

B+C

5. Logic gate combination based on new boolean functions



Picture 3.2. New logic gate combination