

**Homework – 3.13** *\*(add to question)\* temperature, This needs clarifying when both levels are high. The audible warning must not sound in this event.*

4 inputs – levels X and Y  
                  temps U and V

X=0 and Y=0

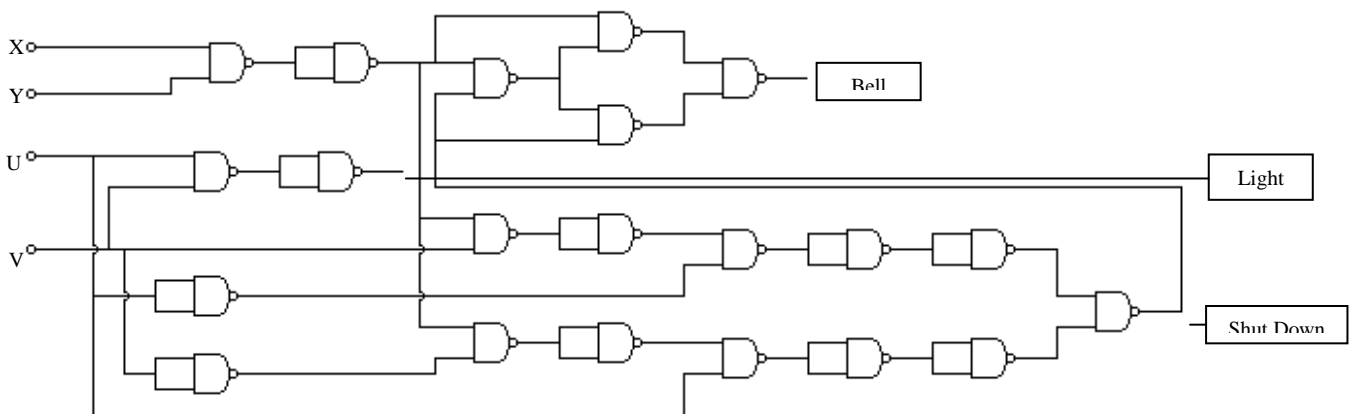
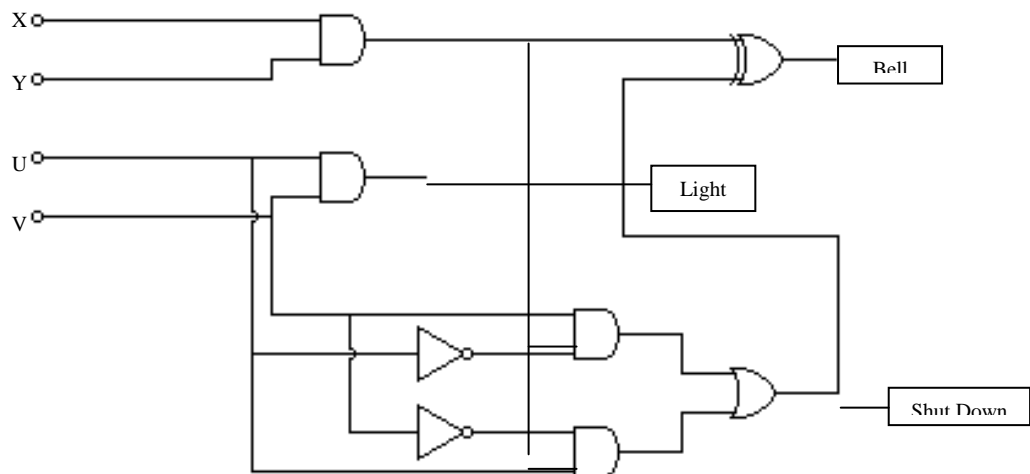
U=0 and V=0

X=1 and Y=1 - Bell

U=1 and V=1 - Light

X=1 and Y=1 and (U or V = 1) - shut down (no bell)

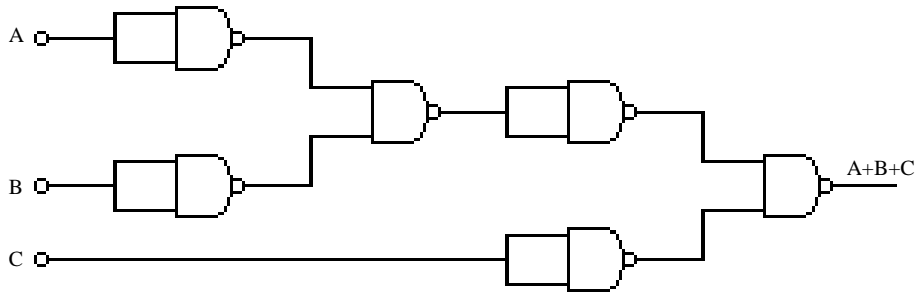
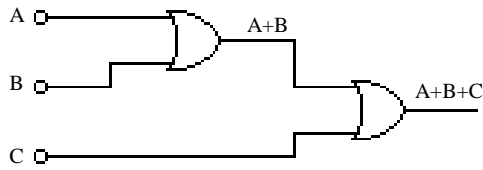
X	Y	U	V	Bell	Light	Shutdown	
0	0	0	0	0	0	0	
0	0	1	1	0	1	0	$\bar{X}.\bar{Y}.U.V$
1	1	0	0	1	0	0	$X.Y.\bar{U}.\bar{V}$
1	1	1	0	1	0	1	$X.Y.U.\bar{V}$
1	1	0	1	1	0	1	$X.Y.\bar{U}.V$



**Homework – 3.14** \*(add to question)\* Only two input gates are available.

Pressure difference ; sensor C  
 Pressure of gas A ; sensor A  
 Pressure of gas B ; sensor B

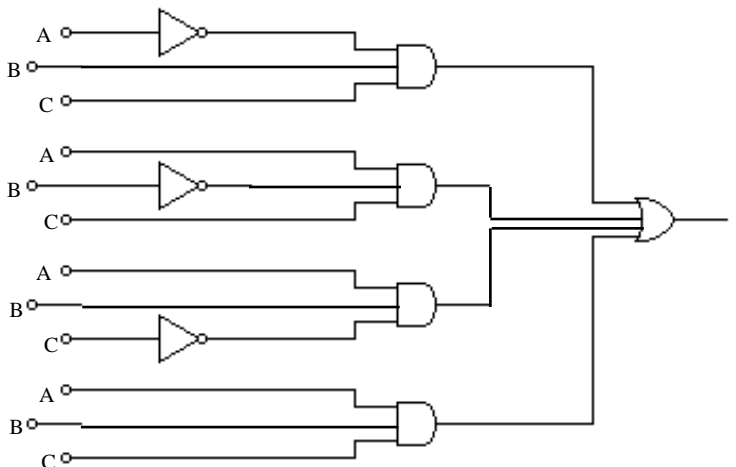
This is a simple three input OR gate.



**Homework – 3.15**

A	B	C	Z
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

$$Z = \bar{A}.B.C + A.\bar{B}.C + A.B.\bar{C} + A.B.C$$



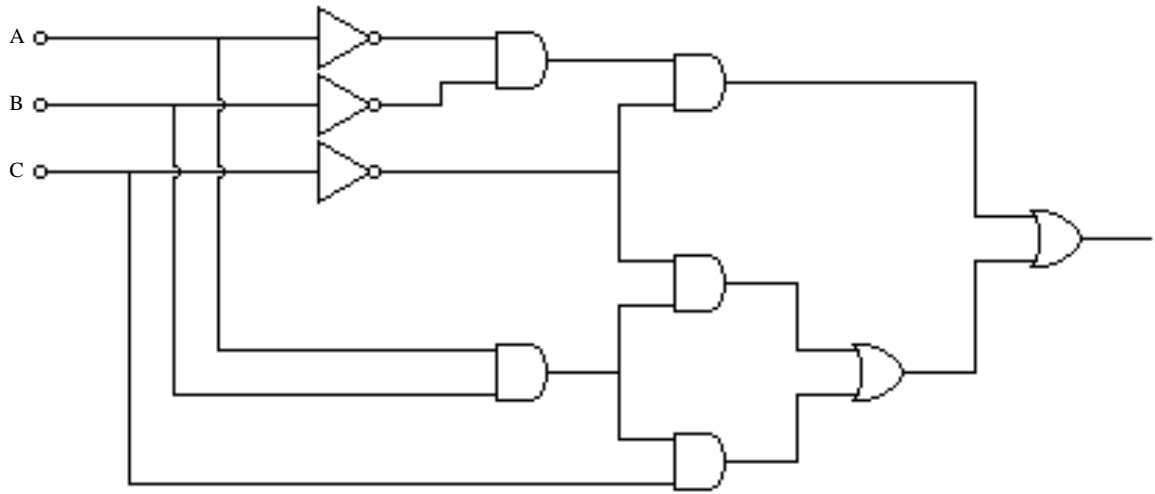
**Homework – 3.16**

(a)

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

(b)  $F = \bar{A}.\bar{B}.\bar{C} + A.B.\bar{C} + A.B.C$

(c)



(d)

