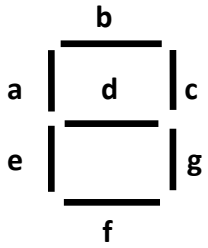
NAME :- AVINASH GAUTAM , ROLL NO. :- 20201407

ASSIGNMENT - 1 (CSA)

In this assignment, We have 4 inputs A , B , C , D & 7 led outputs a , b , c , d ,e , f , g. These leds are arranged in a specific format and with the help of inputs we will try to show the numbers 0 – 9 in the specific format using leds on & off. These 7 leds are arranged as :-



TRUTH TABLE :-

A	*B*	*C*	*D*	*a*	*b*	*c*	*d*	*e*	*f*	*g*
0	*0*	*0*	*0*	*1*	*1*	*1*	*0*	*1*	*1*	*1*
0	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*1*
0	*0*	*1*	*0*	*0*	*1*	*1*	*1*	*1*	*1*	*0*
0	*0*	*1*	*1*	*0*	*1*	*1*	*1*	*0*	*1*	*1*
0	*1*	*0*	*0*	*1*	*0*	*1*	*1*	*0*	*0*	*1*
0	*1*	*0*	*1*	*1*	*1*	*0*	*1*	*0*	*1*	*1*
0	*1*	*1*	*0*	*1*	*1*	*0*	*1*	*1*	*1*	*1*
0	*1*	*1*	*1*	*0*	*1*	*1*	*0*	*0*	*0*	*1*
1	*0*	*0*	*0*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
1	*0*	*0*	*1*	*1*	*1*	*1*	*1*	*0*	*1*	*1*
1	*0*	*1*	*0*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
1	*0*	*1*	*1*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
1	*1*	*0*	*0*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
1	*1*	*0*	*1*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
1	*1*	*1*	*0*	*x*	*x*	*x*	*x*	*x*	*x*	*x*
1	*1*	*1*	*1*	*x*	*x*	*x*	*x*	*x*	*x*	*x*

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Equations, Circuit Diagram & K-map (In SOP form) : -

(1) *a*

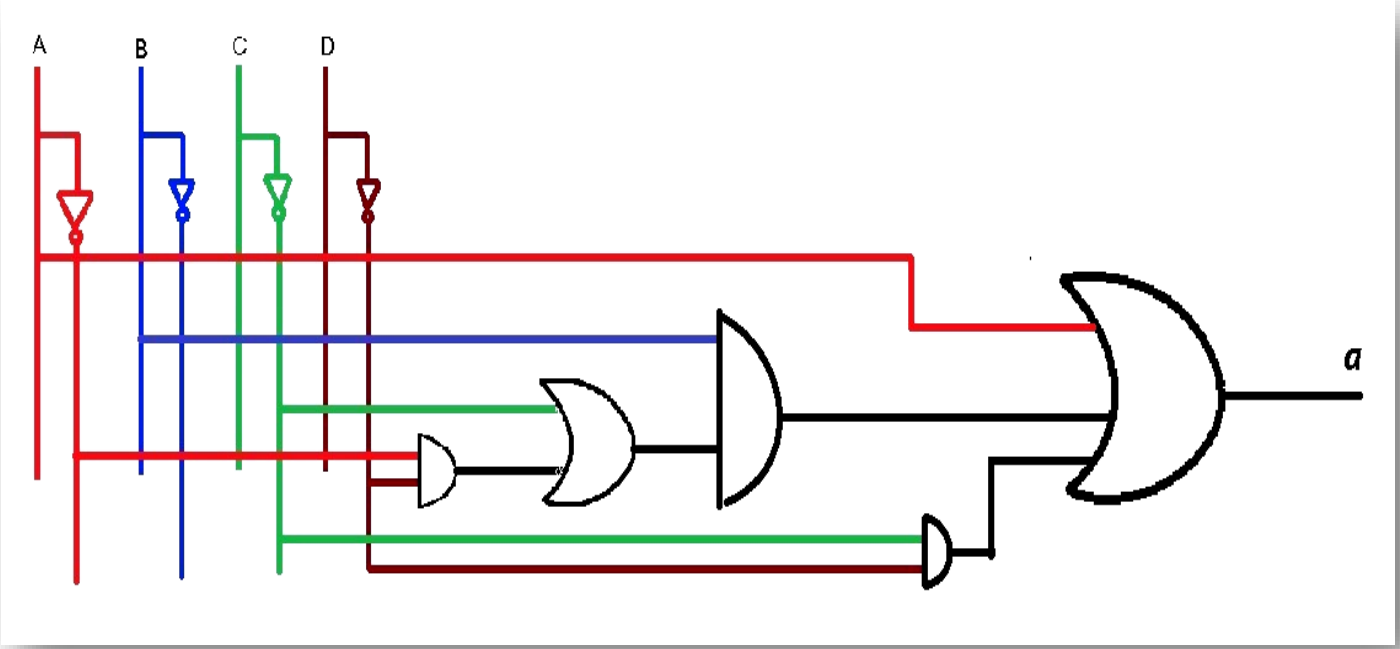
K-map :-

AB \ CD	00	01	11	10
00	1	0	0	0
01	1	1	0	1
11	X	X	X	X
10	1	1	X	X

Equation:-

$$a = A + B.(C' + A'.D') + C'.D'$$

Circuit Diagram :-



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(2) ***b***

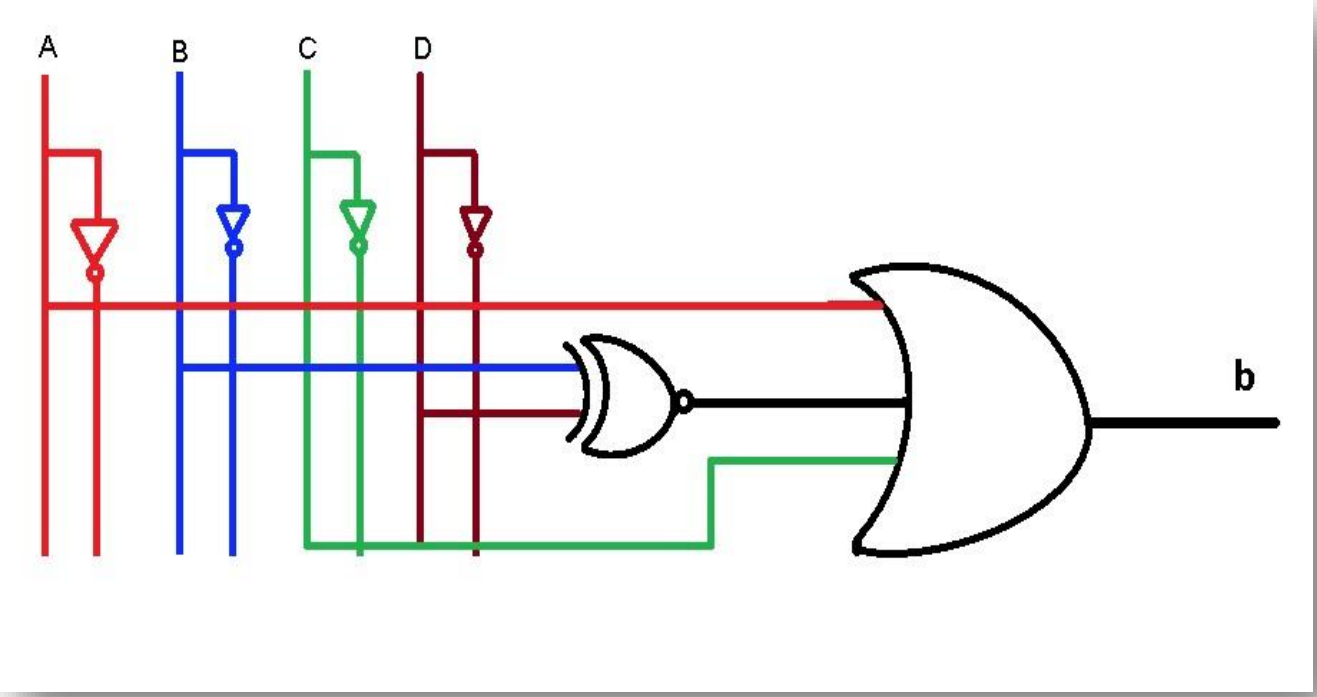
K-map :-

AB \ CD	00	01	11	10
00	1	0	1	1
01	0	1	1	1
11	X	X	X	X
10	1	1	X	X

Equation:-

$$b = A + B \odot D + C$$

Circuit Diagram :-



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(3) *C*

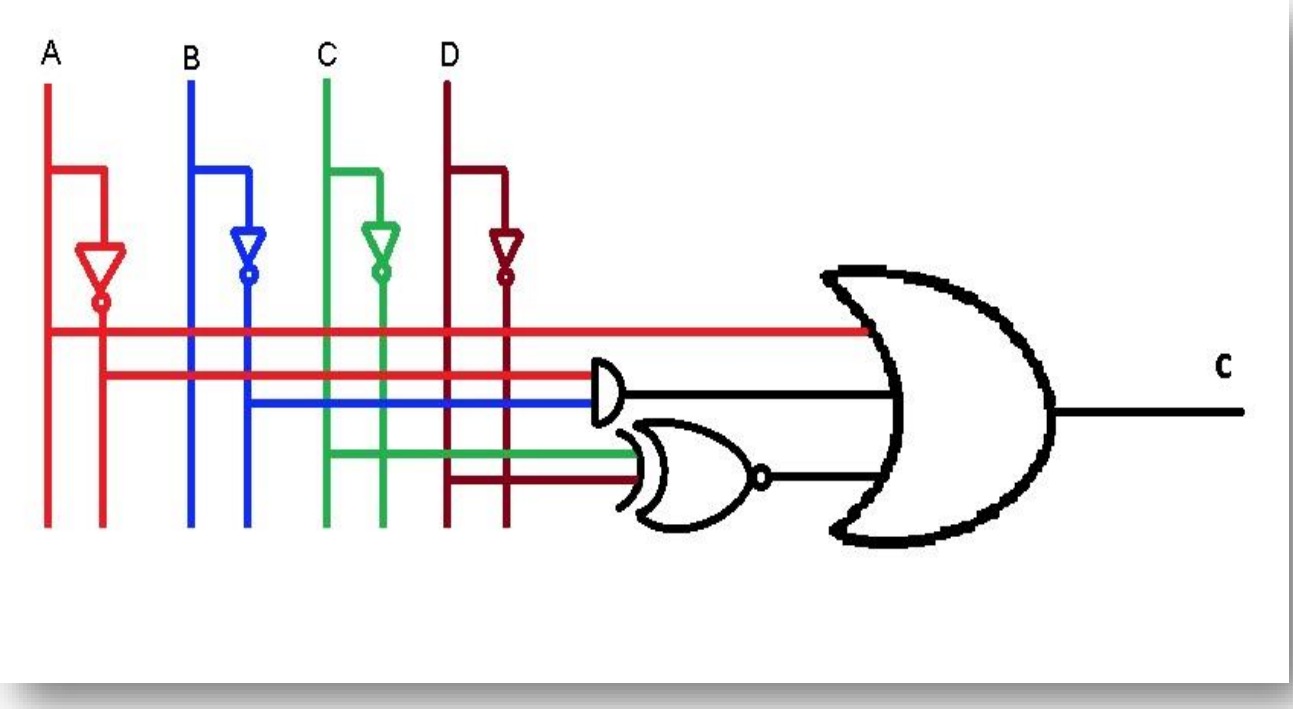
K-map :-

AB \ CD	00	01	11	10
00	1	1	1	1
01	1	0	1	0
11	X	X	X	X
10	1	1	X	X

Equation:-

$$c = A + A'.B' + C \odot D$$

Circuit Diagram :-



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(4) *d*

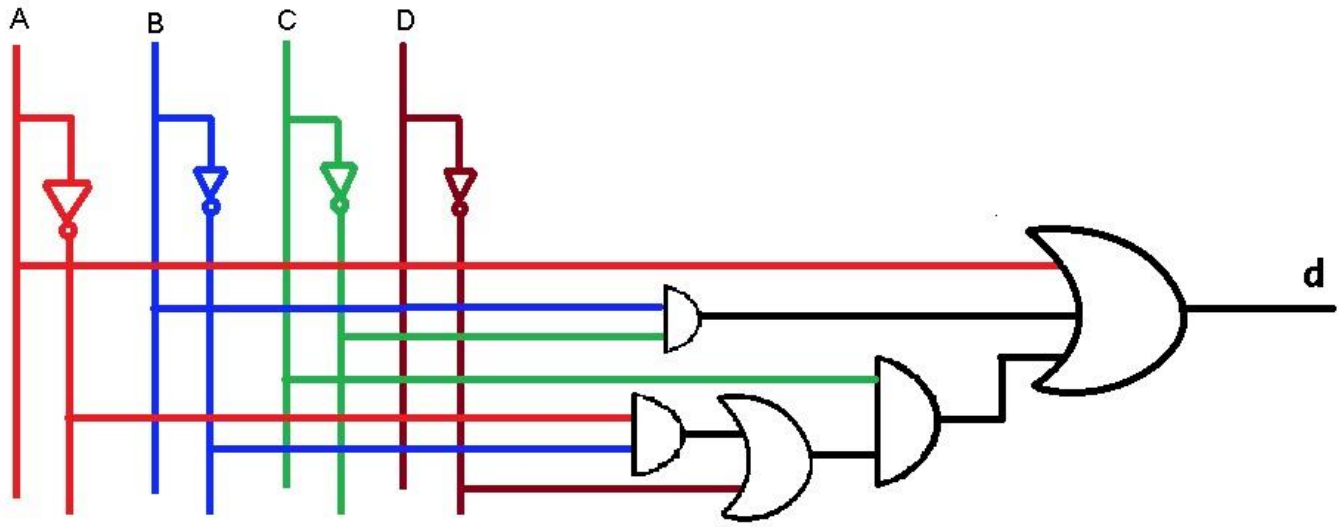
K-map :-

AB \ CD	00	01	11	10
00	0	0	1	1
01	1	1	0	1
11	X	X	X	X
10	1	1	X	X

Equation:-

$$d = A + B.C' + C.(A'.B' + D')$$

Circuit Diagram :-



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(5) ***e***

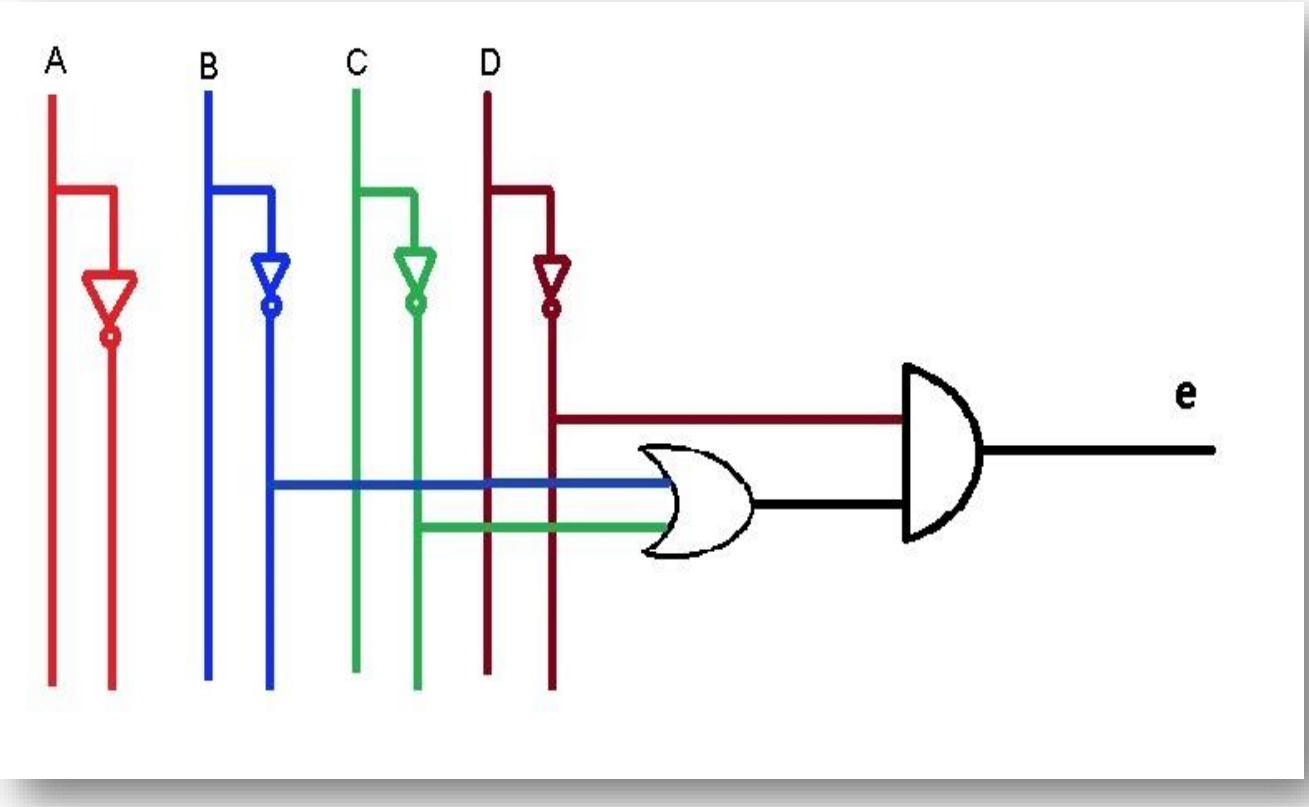
K-map :-

AB \ CD	00	01	11	10
00	1	0	0	1
01	0	0	0	1
11	X	X	X	X
10	1	0	X	X

Equation:-

$$e = D'.(B' + C)$$

Circuit Diagram :-



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(6) f

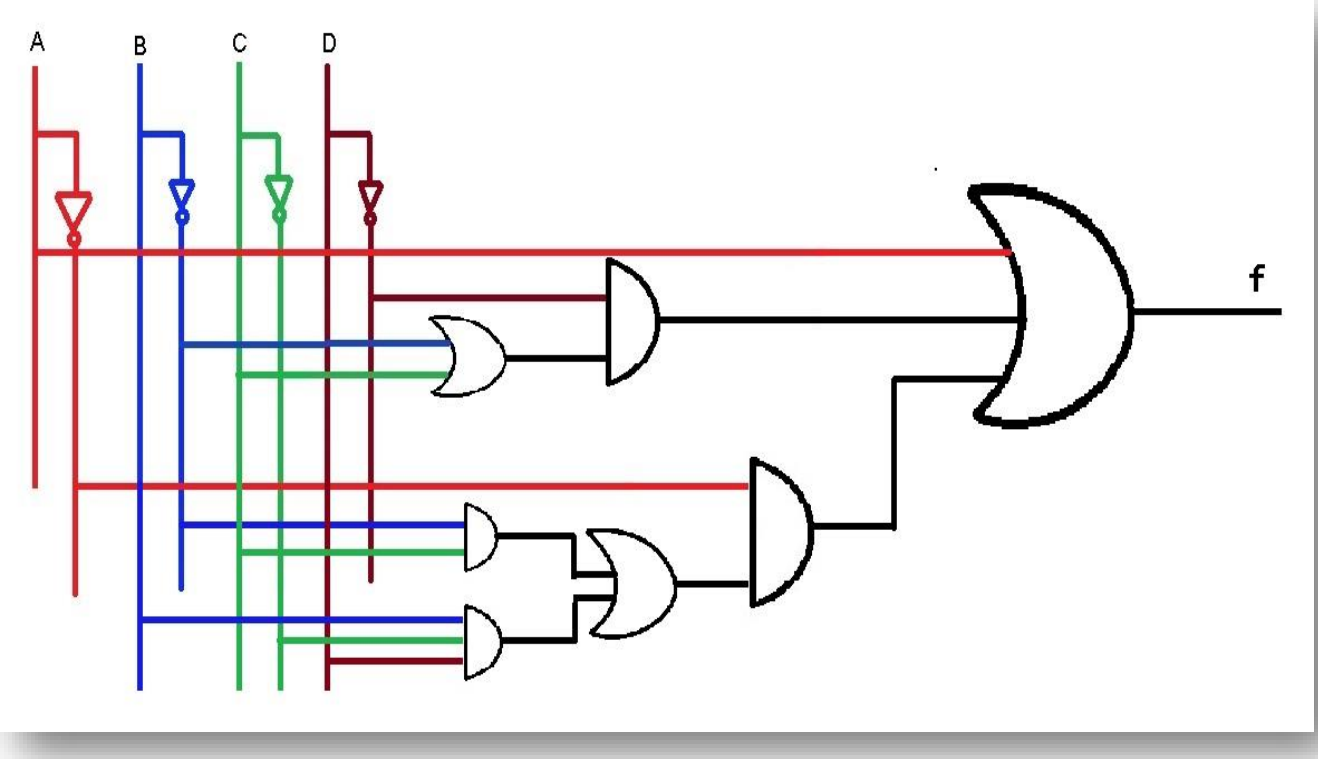
K-map :-

AB \ CD	00	01	11	10
00	1	0	1	1
01	0	1	0	1
11	X	X	X	X
10	1	1	X	X

Equation:-

$$f = A + D'.(B' + C) + A'.(B'.C + B.C'.D)$$

Circuit Diagram :-



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(7) *g*

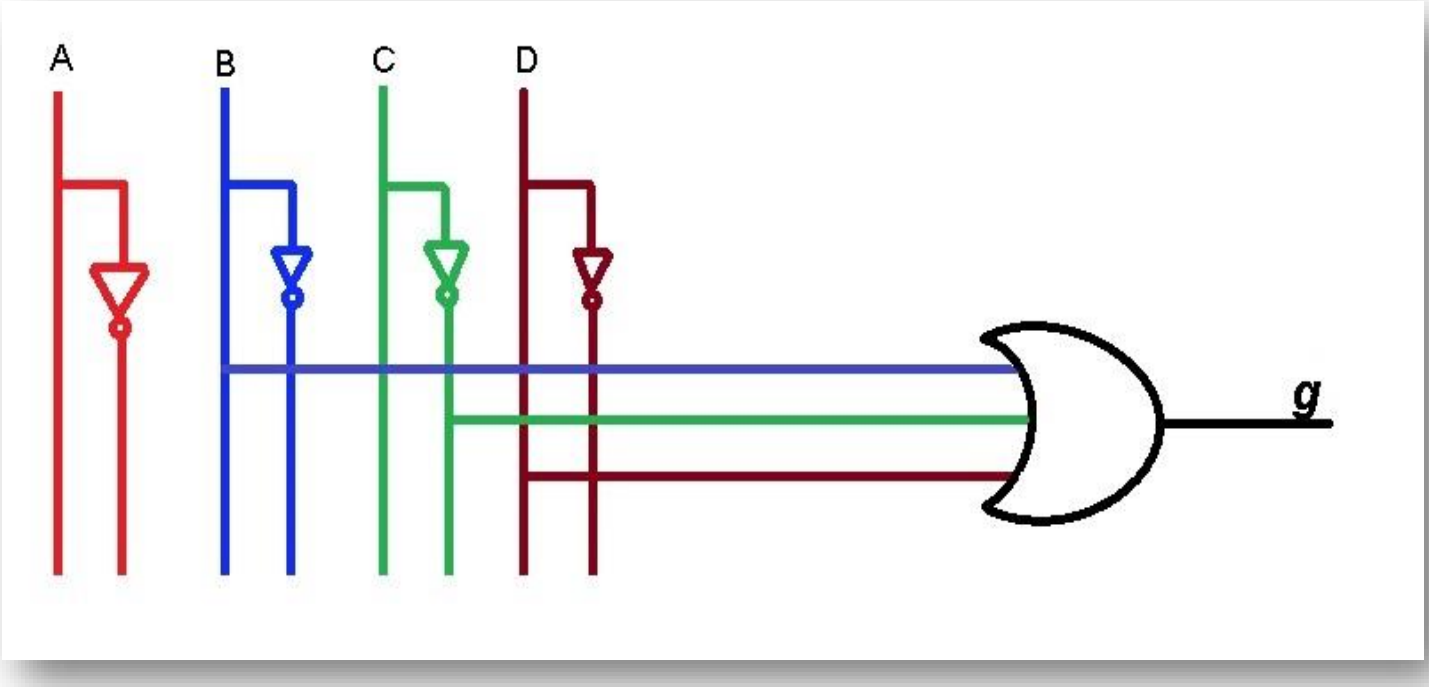
K-map :-

AB \ CD	00	01	11	10
00	1	1	1	0
01	1	1	1	1
11	X	X	X	X
10	1	1	X	X

Equation:-

$$g = B + C' + D$$

Circuit Diagram :-



THE END