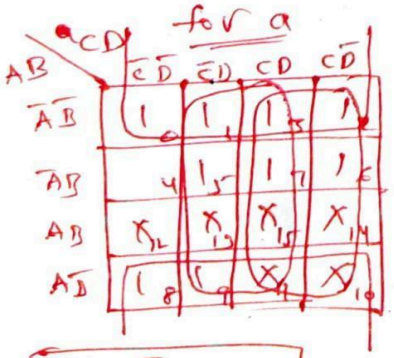
Q1.

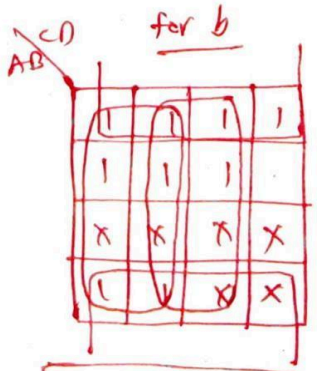
The Last 2 - digits are 46

Truth Table :-

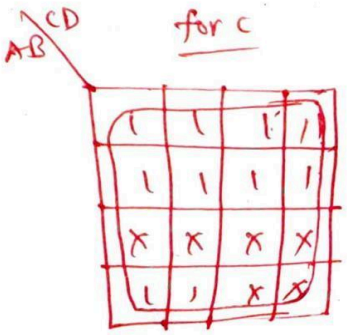
BCD inputs				7 - Segment Display							Symbol
A	B	C	D	a	b	c	d	e	f	g	
0	0	0	0	1	1	1	1	1	1	0	
0	0	0	1	1	1	1	1	1	1	0	
0	0	1	0	1	1	1	1	1	1	0	
0	0	1	1	1	1	1	1	1	1	0	
0	1	0	0	0	1	1	0	0	1	1	
0	1	0	1	1	1	1	1	1	1	0	
0	1	1	0	1	0	1	1	1	1	1	
0	1	1	1	1	1	1	1	1	1	0	
1	0	0	0	1	1	1	1	1	1	0	
1	0	0	1	1	1	1	1	1	1	0	
1	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	



$a = \bar{B} + C + D$



$b = \bar{B} + \bar{C} + D$



$c = 1$

Similarly

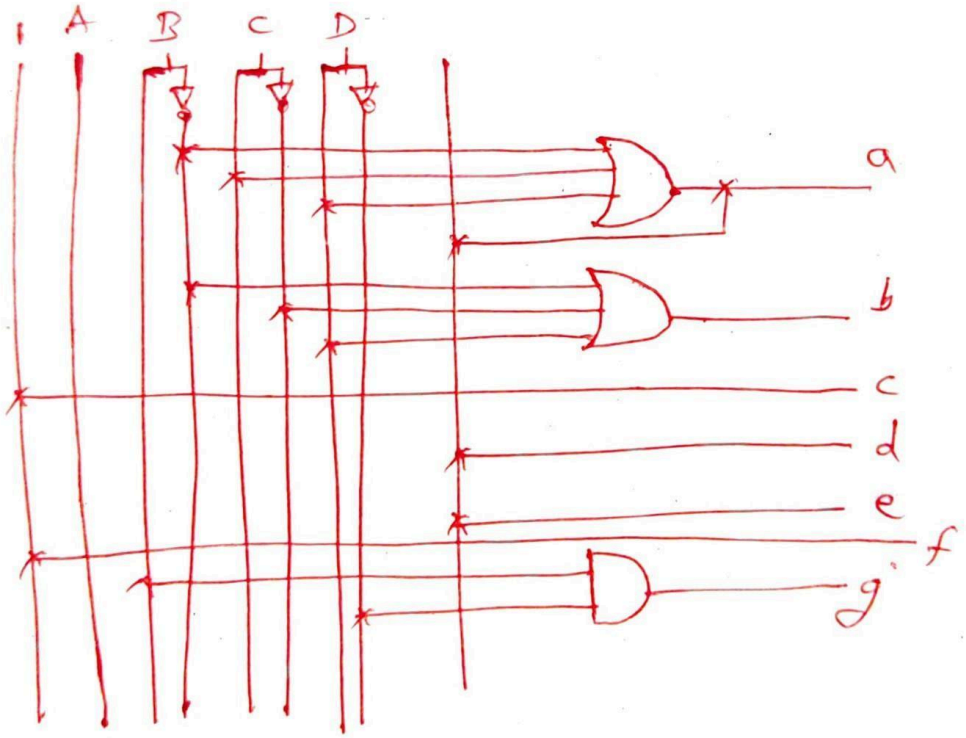
$d = \bar{B} + C + D$

$e = \bar{B} + C + D$

$f = 1$

$g = B\bar{D}$

Logic Circuit :-



Q2.

All the D-flip-flop and gates used in the circuit have non-zero propagation delay resulting in spurious transitions on glitches.

These are several ways to eliminate them and they are as follows:

1. Reducing switching activity
2. Gate sizing
3. Gate freezing
4. Gate triggering
5. Multiple threshold transistors