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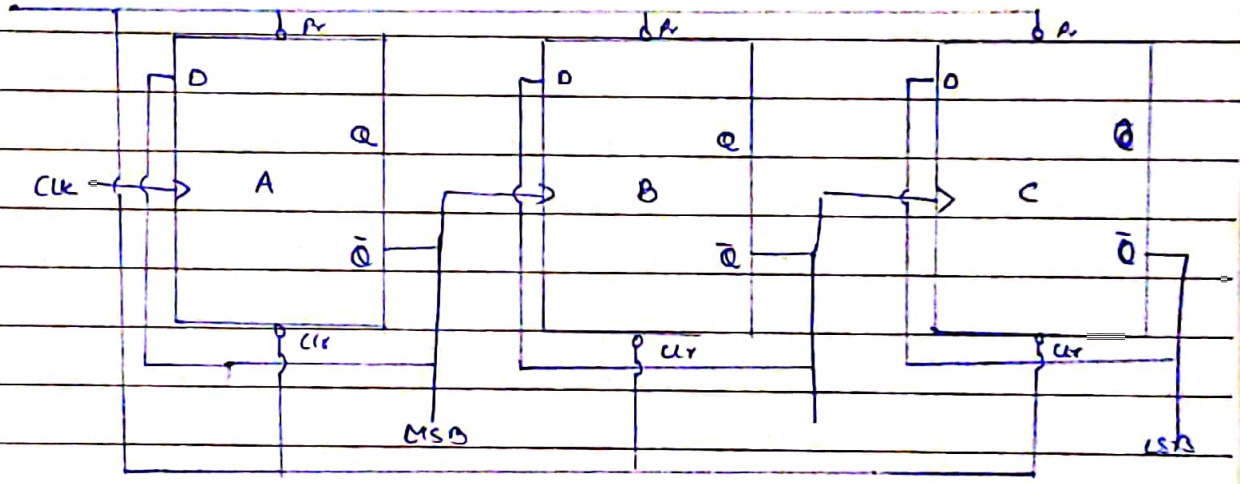
Assignment 2

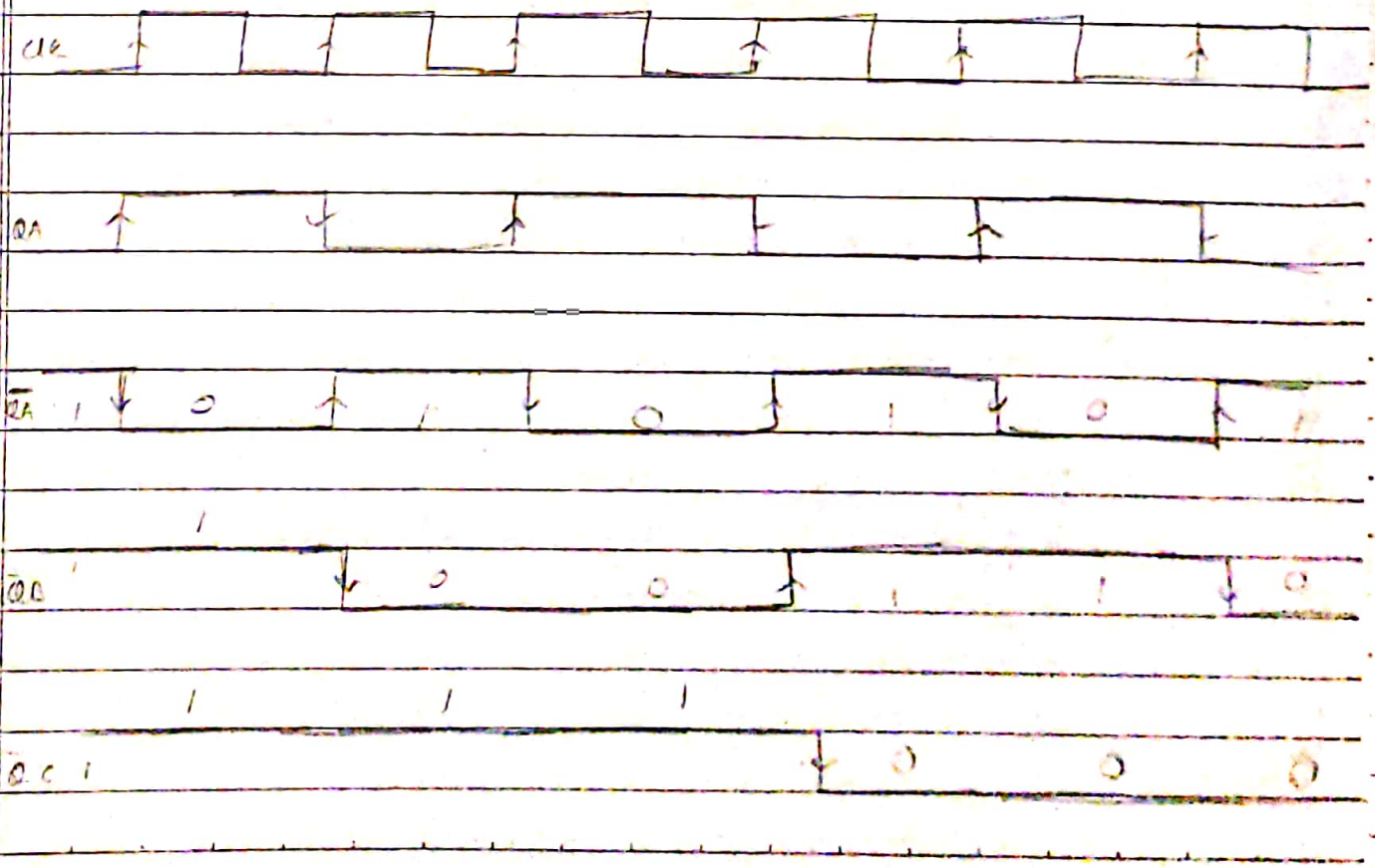
Name: Sravat Shah

SAP: 60004220126

Term Test 2.

1. 3 bit Asynchronous down counter. Rising edge D flip flop.





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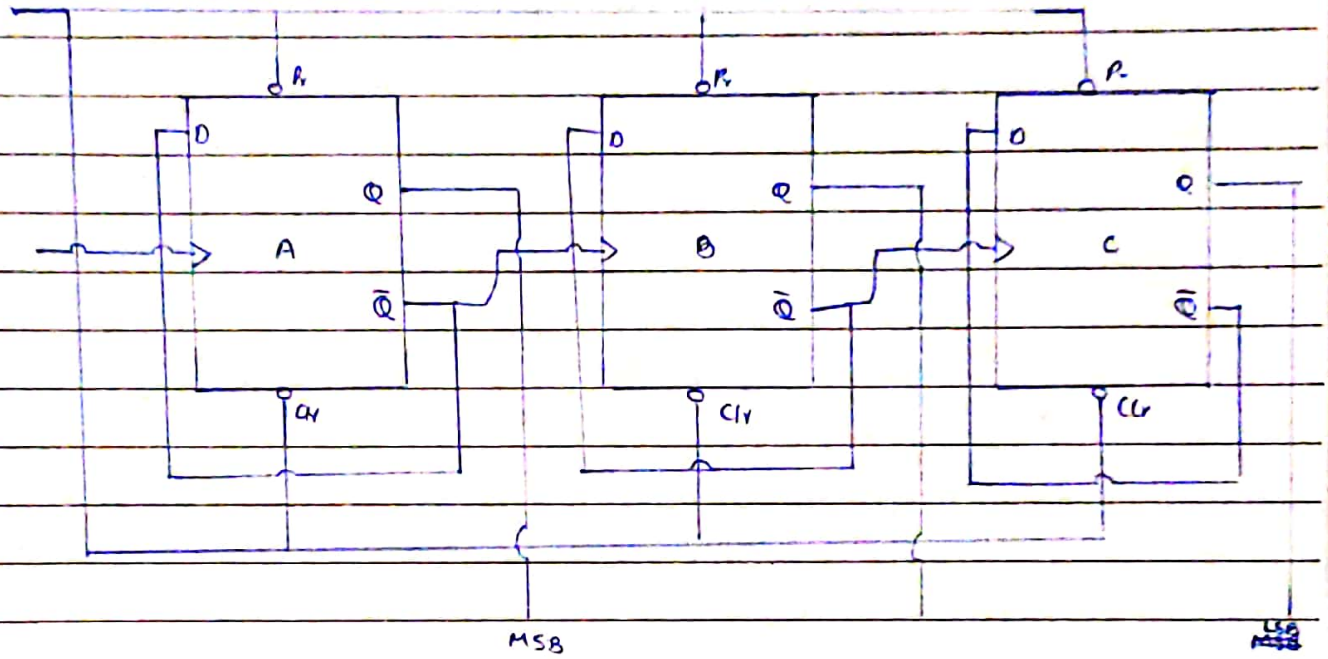
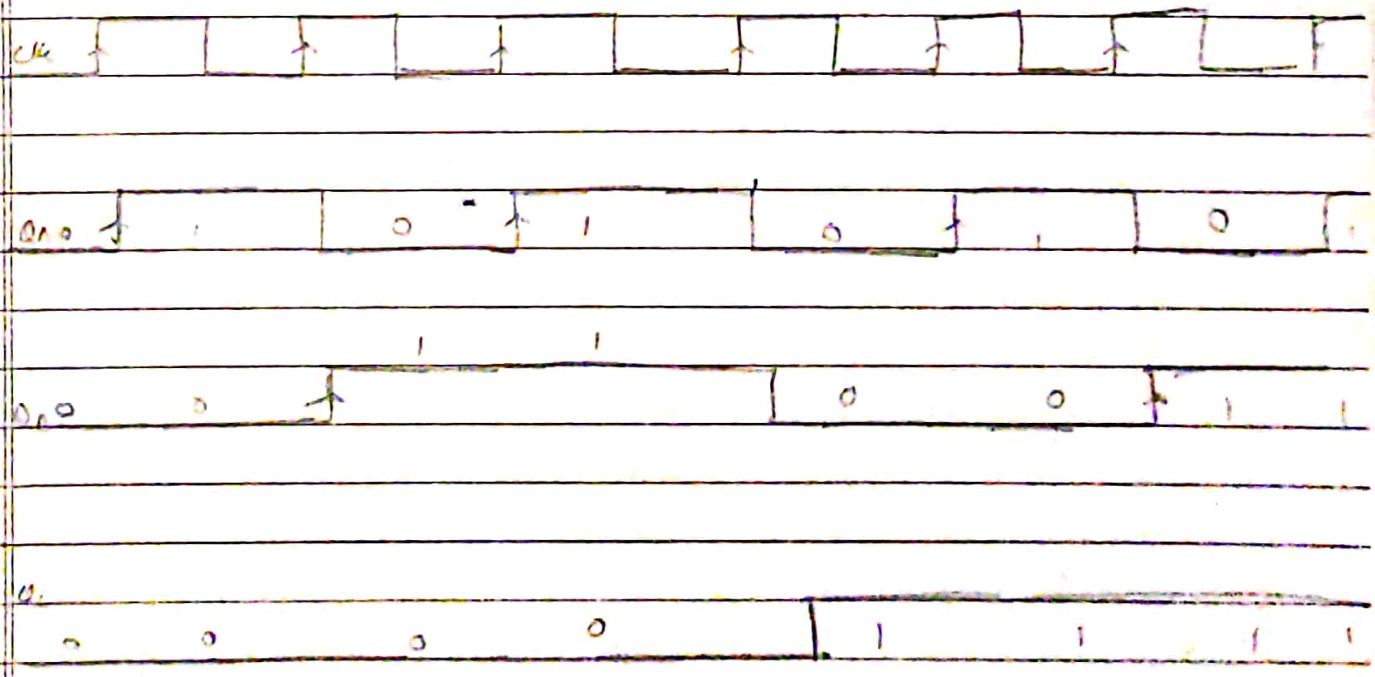
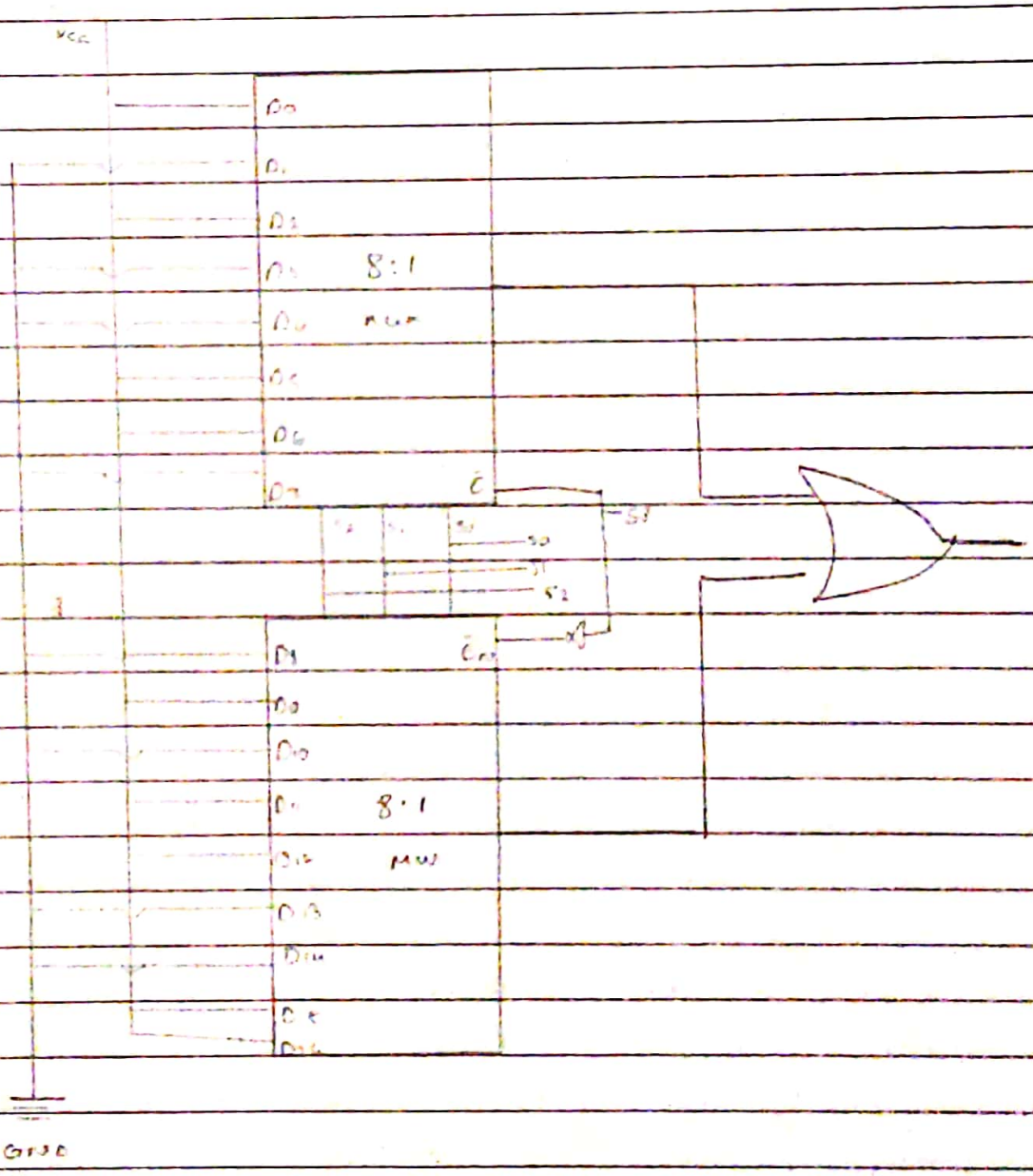
Q2 3 bit Asynchronous Up counter. Rising edge. D flip flop.





2) 8 SOP using 8 : 1 MUX

$Y = \Sigma m (0, 2, 3, 6, 9, 11, 12, 15)$



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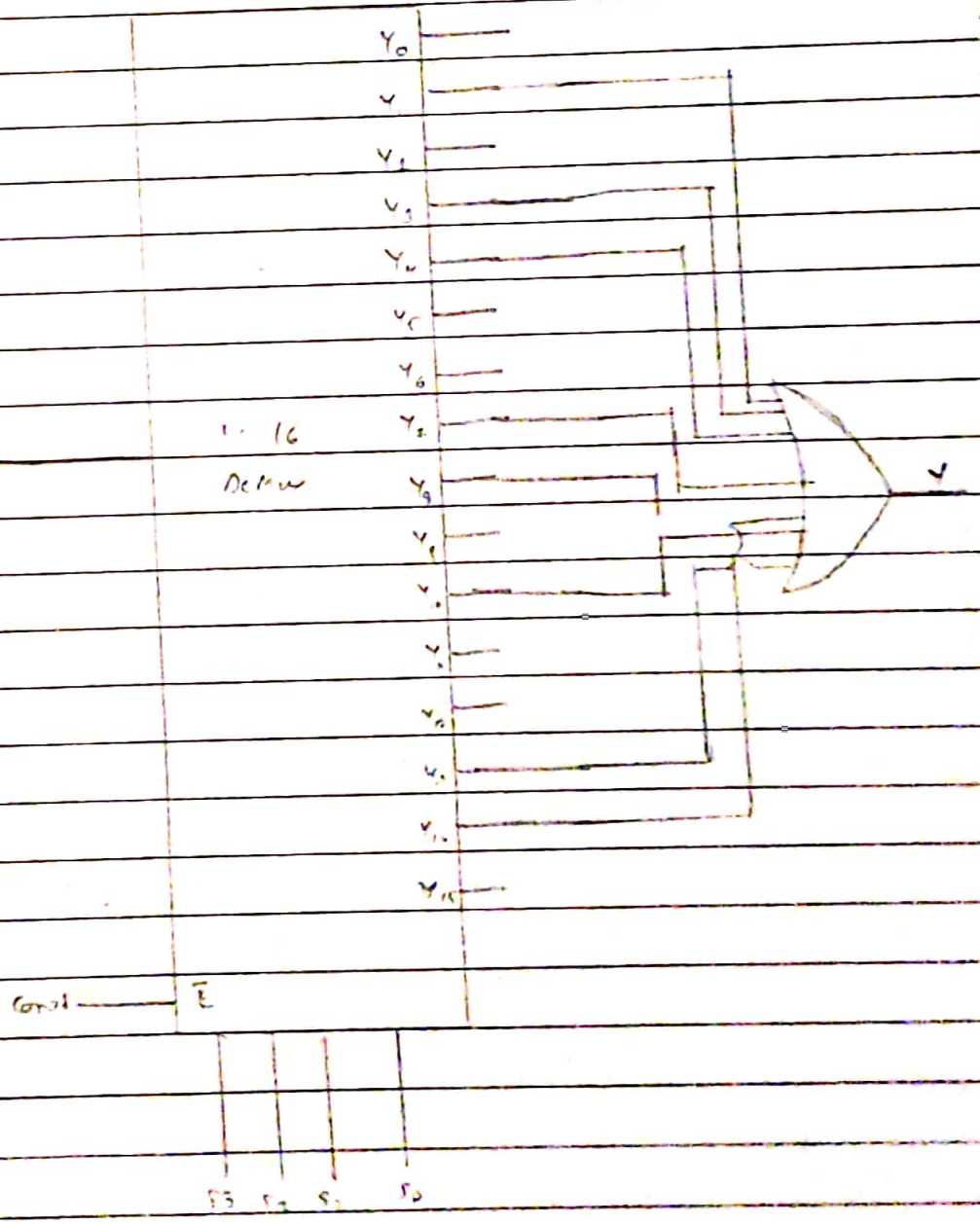
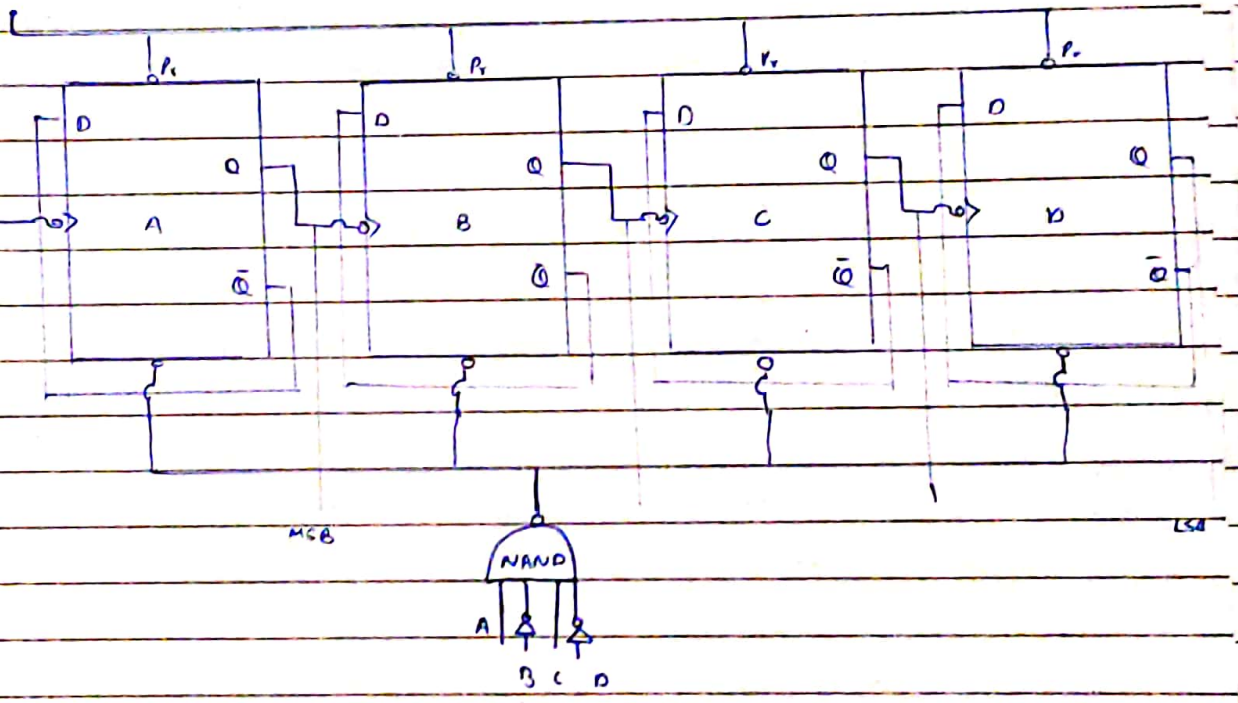
$y = \Pi m\ (0, 2, 5, 6, 9, 11, 12, 15)$

$y = \Sigma m\ (1, 3, 4, 7, 8, 10, 13, 14)$

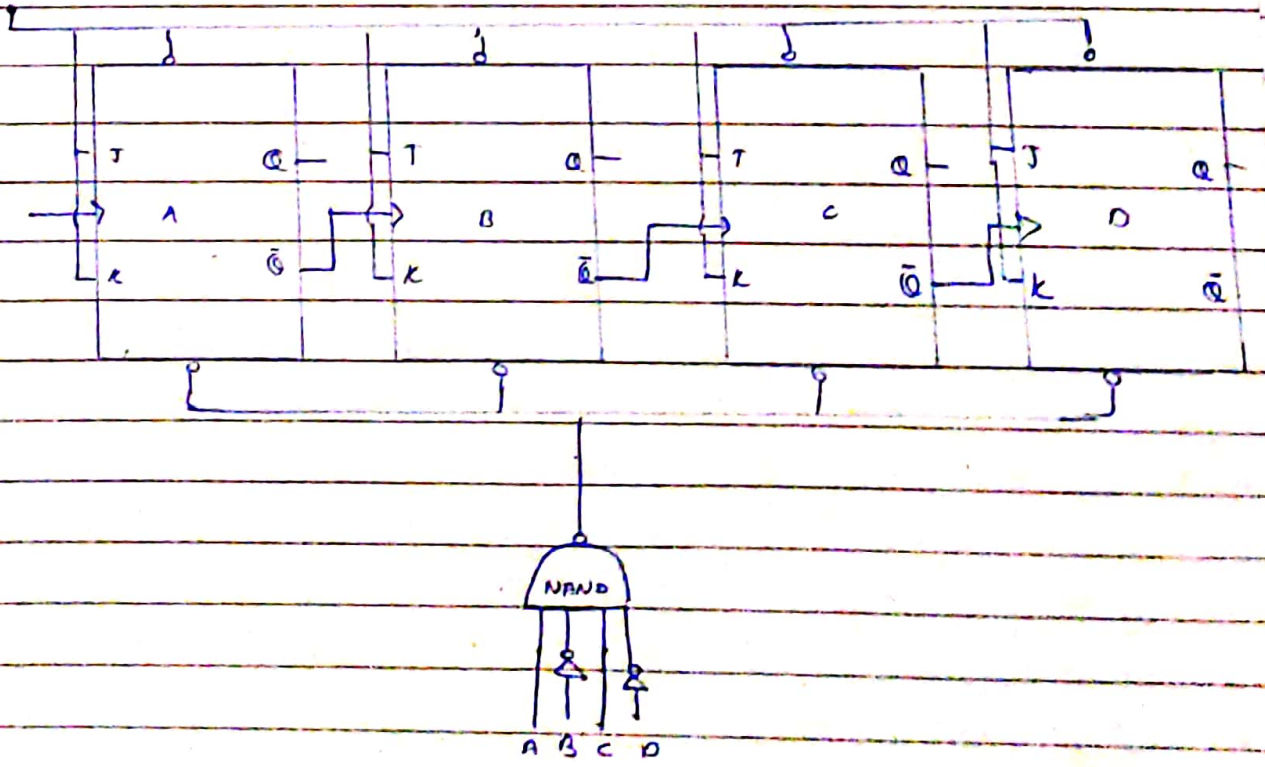


3a Mod 10 Asynchronous Up counter D flip flop.

Falling edge.

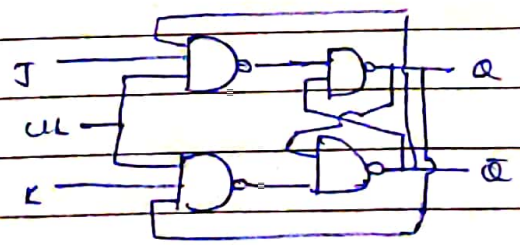


3b



4a Preset and clear are referred as asynchronous inputs in a flipflop.
These are mainly asynchronous.
1) They do not depend on the clock signals whatever they may be.
2) These can be used to set or reset the flipflops.
3) Hence these are very helpful when it comes to mod counters.
4) When the preset input is active, the flip flop will become Q = 1 regardless of any clock signal states.
5) When the ~~preset~~ clear input is active, the flip flop will become Q = 0 regardless of the synchronous clock inputs.
6) When multiple flipflops combine together to perform a function, we need to use set or reset to reset them all at once. Hence we use the preset and clear inputs.

4b J.K flipflop.



	Clk	J	K	Q	$\bar{Q}$
truth table,	0	0	0	Q	$\bar{Q}$
	1	0	0	Q	$\bar{Q}$
	1	0	1	0	1
	1	1	0	1	0
	1	1	1	Toggle	

5 Seven Segment display configuration.

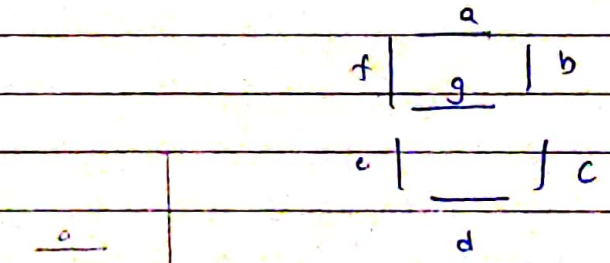
→ Seven segment display configuration has 7 LEDs, lights and 1 decimal point LED.

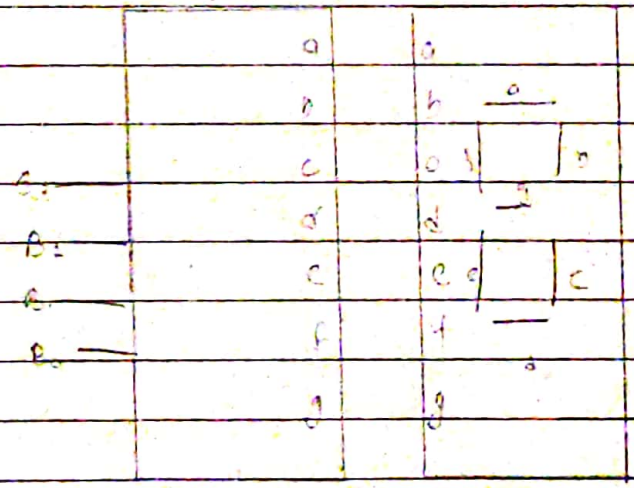
Each of the seven segment LED is called a segment.

→ These displays are using in digital clock for basic calculators.

→ Segments are named from a to g.

→ According to the output required we provide inputs to the seven segment and accordingly LEDs light up.





7 segment

B_3	B_2	B_1	B_0	a	b	c	d	e	f	g
0	0	0	0	1	1	1	1	1	1	0
0	0	0	1	0	1	1	0	0	0	0
0	0	1	0	1	1	0	1	1	0	1
0	0	1	1	1	1	1	1	0	0	1
0	1	0	0	0	1	1	0	0	1	1
0	1	0	1	1	0	1	1	0	1	1
0	1	1	0	1	0	1	1	1	1	1
0	1	1	1	1	1	1	0	0	0	0
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	1	0	1	1

b) Explain ways to achieve Binary to Excess 3 code

→ Excess -3 code can also be represented as XS - 3 code.

→ In excess 3 code each digit of decimal number is represented by adding 3 in each decimal digit.

Following step to convert binary number into excess 3 code.

1) Convert the binary number to decimal.
2) Add 3 in each digit of decimal number
3) Find binary code of each digit of newly generated number.