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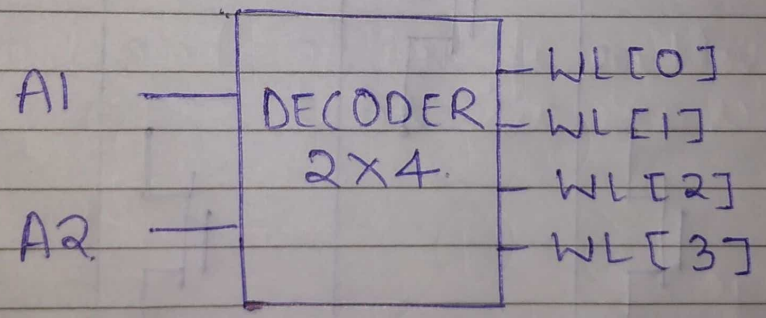
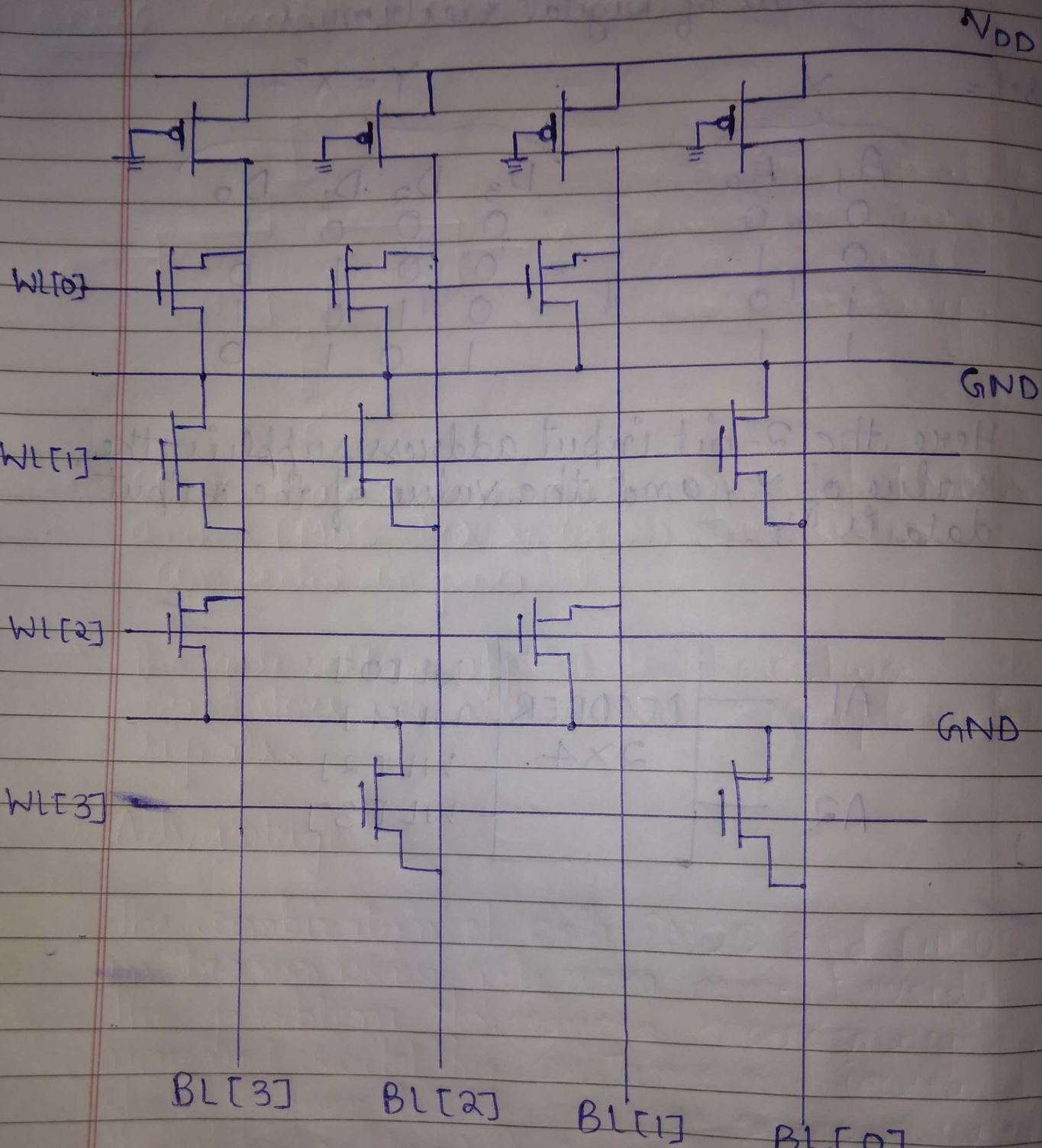
Quiz of Digital Electronics.

Ans.1 =

X		$Y = X^2 + 1$			
A_1	A_0	D_3	D_2	D_1	D_0
0	0	0	0	0	1
0	1	0	0	1	0
1	0	0	1	0	1
1	1	1	0	1	0

Here the 2-bit input address supplies the value of X, and the value of the output data is Y.





Transistors used :-
10 NMOS transistors + 4 PMOS transistors.

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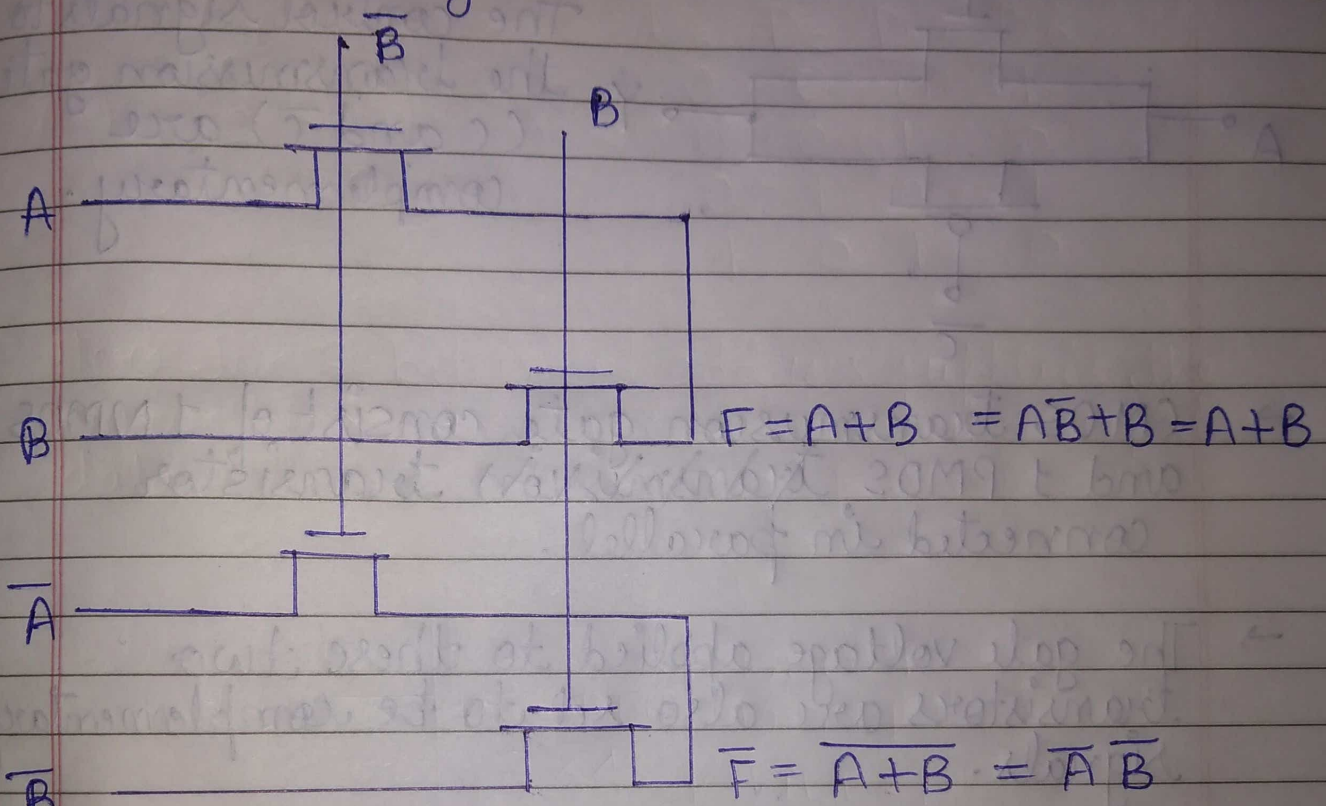
Ans. 3:

OR gate implementation using Pass transistor logic :-



Pass transistor logic is not a static logic but it is a ratioed logic.
Yes, Pass transistor is a static logic.

Ans. 4 = Differential Cascode Voltage Switch Logic (or DCVSL)

Ans. 5 = Differential Cascode Voltage Switch Logic (or DCVSL)

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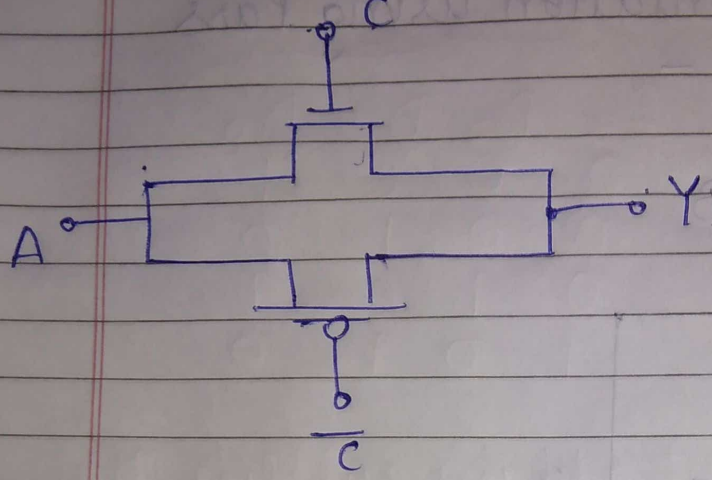
Ans. 6. Circuit of CMOS transmission gate.



The control signals to the transmission gate (C and $\bar{C}$) are complementary.

→ CMOS transmission gate consist of 1 NMOS and 1 PMOS transmission transistor connected in parallel.

→ The gate voltage applied to these two transistors are also set to be complementary signals.

→ Advantage :-

The combination of both PMOS and NMOS in transmission gate arrangement avoids the problem of reduced noise margin, increased switching resistance and increased static power dissipation (caused by increased threshold voltage) but requires that the control and its complement be available