

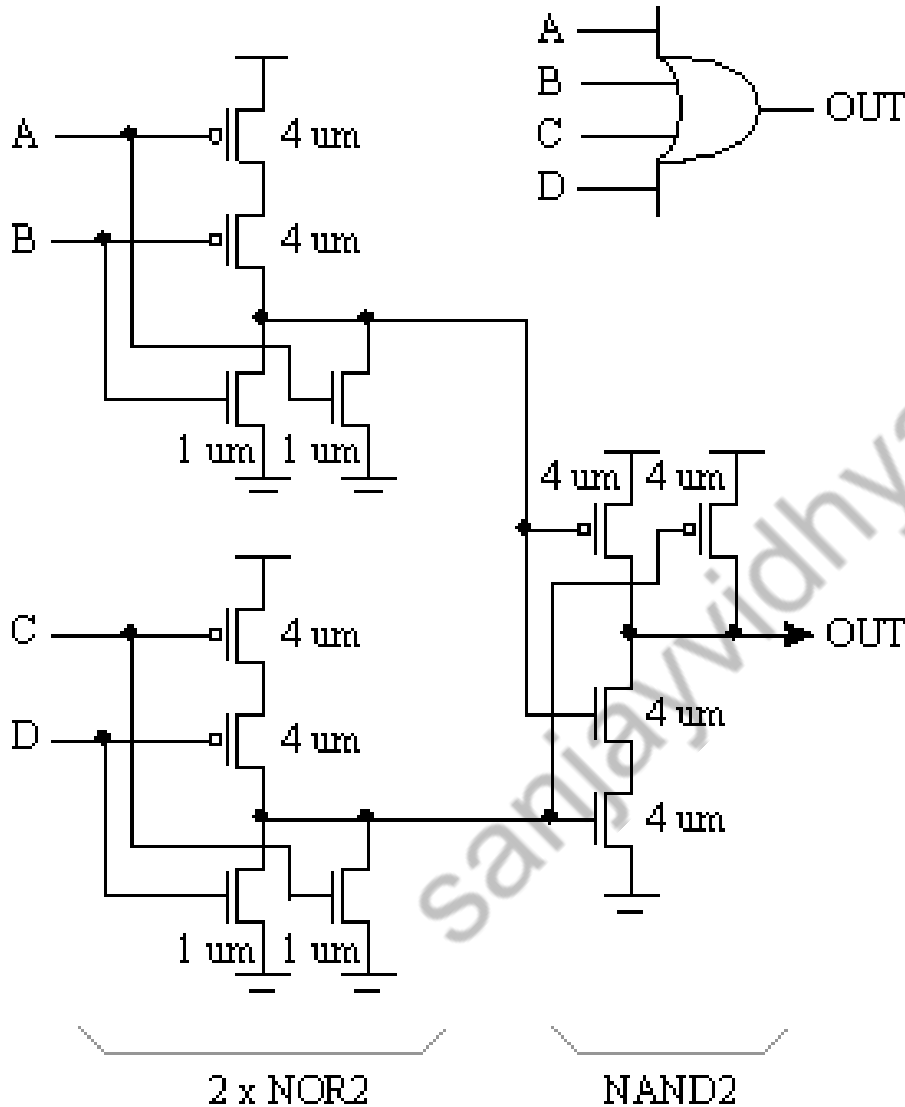
VLSI Design Using LT SPICE

Dynamic CMOS Design

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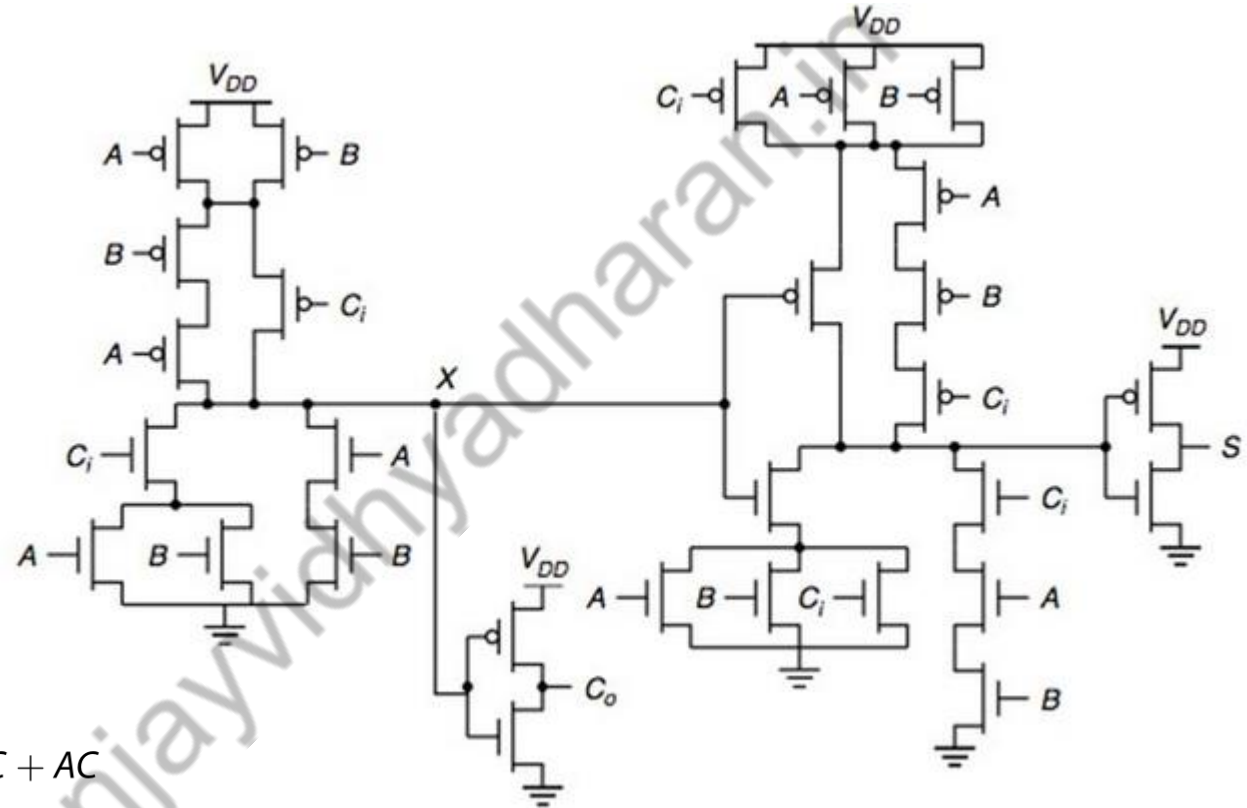


Static CMOS Logic



- Area Large
- Static Dissipation
- Dynamic Dissipation
 - Short Circuit
 - Switching Loss

Static Full Adder

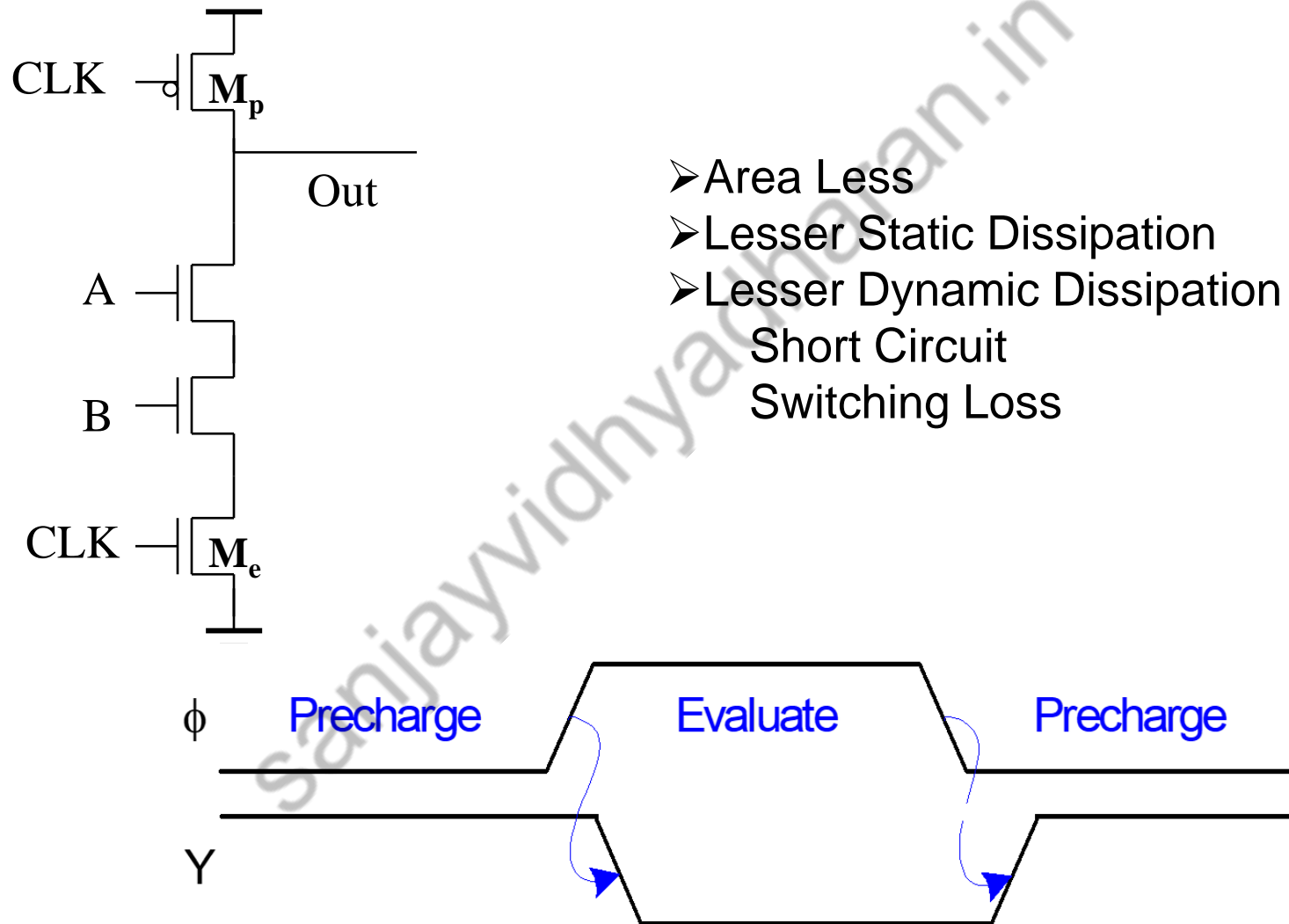


$$\text{Carry}(CY) = AB + BC + AC$$

$$\text{Sum}(S) = \bar{A}\bar{B}C\bar{C} + A\bar{B}\bar{C} + \bar{A}B\bar{C} + ABC$$

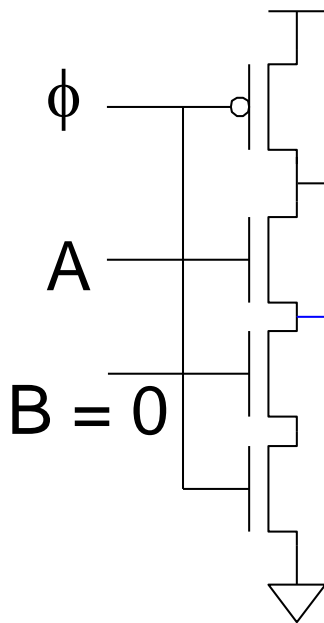
$$\left. \begin{array}{l} CY = AB + C(A + B) \\ S = \bar{C}\bar{Y}(A + B + C) + ABC \end{array} \right\} \begin{array}{l} \text{Simplified} \\ \text{Expressions} \end{array}$$

Dynamic Logic



Dynamic Logic

- **Dynamic Logic Suffers from Charge Sharing Phenomenon**

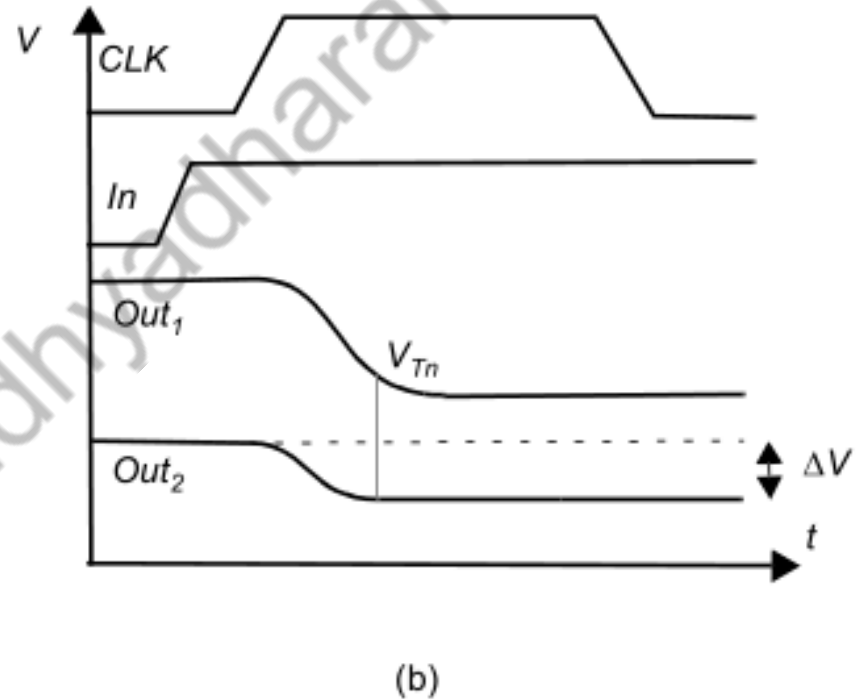
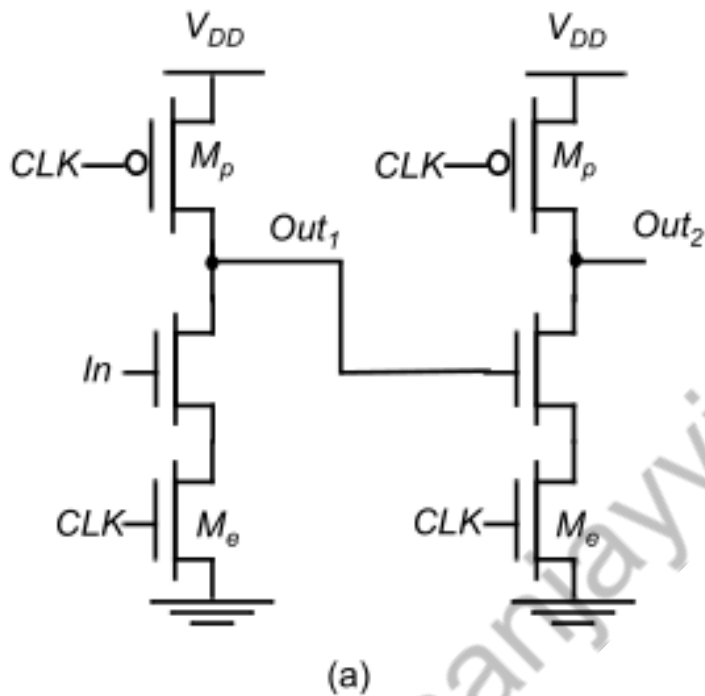


$$Y = \frac{V_{DD} C_Y}{C_X + C_X}$$

[6] Rabaey, J. M., Chandrakasan, A., & Nikolic, B. (2016). "Digital Integrated Circuits: A design perspective" (Second edition ed.). S.l.: Pearson Education India.

Dynamic Logic

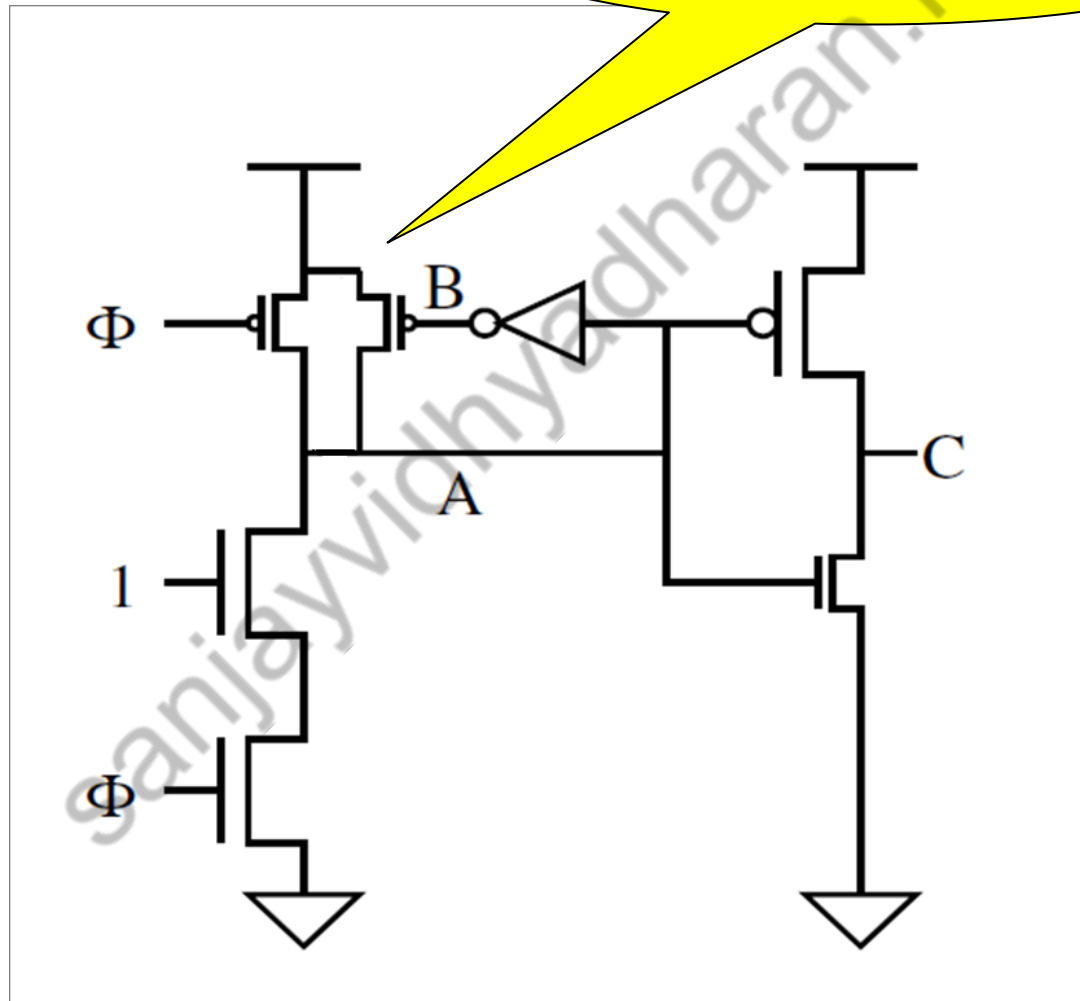
➤ Cascading Dynamic Gates



[6] Rabaey, J. M., Chandrakasan, A., & Nikolic, B. (2016). "Digital Integrated Circuits: A design perspective" (Second edition ed.). S.l.: Pearson Education India.

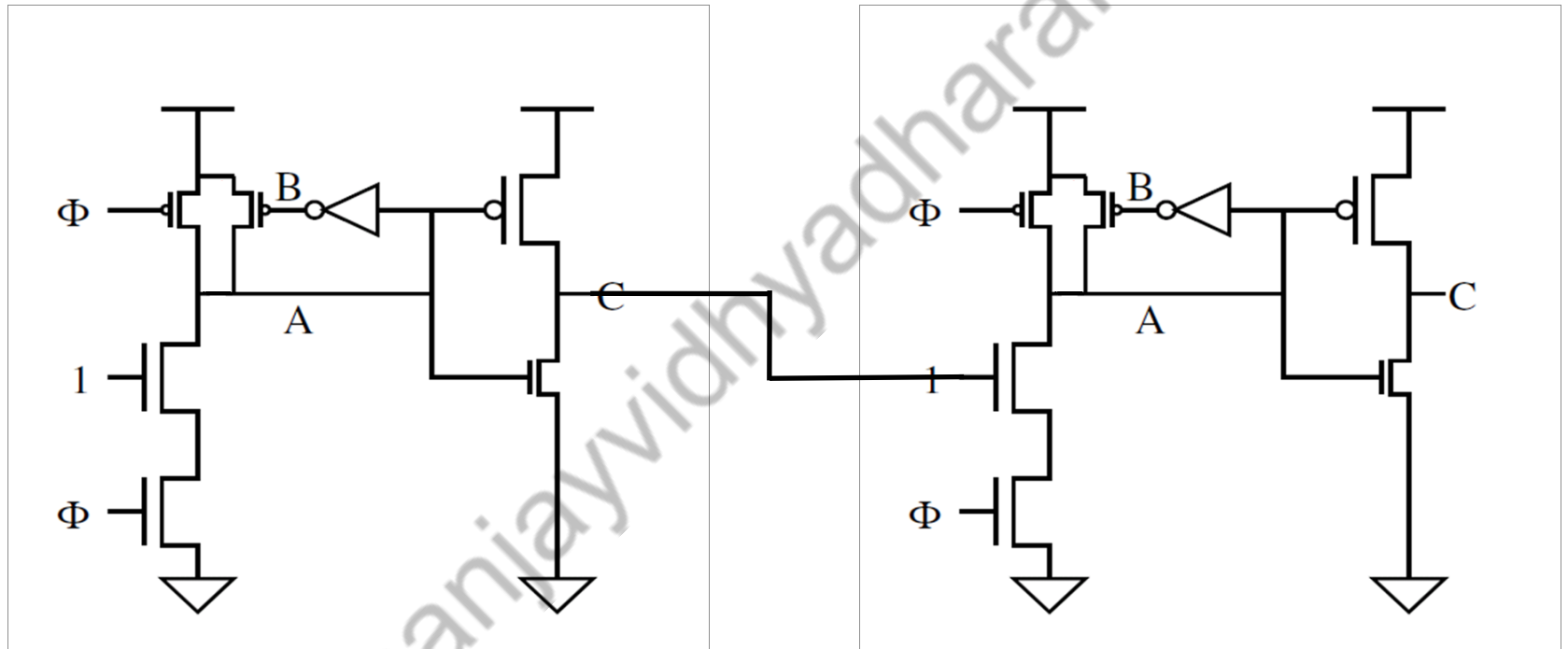
Domino Logic

Keeper PMOS used to restore high state

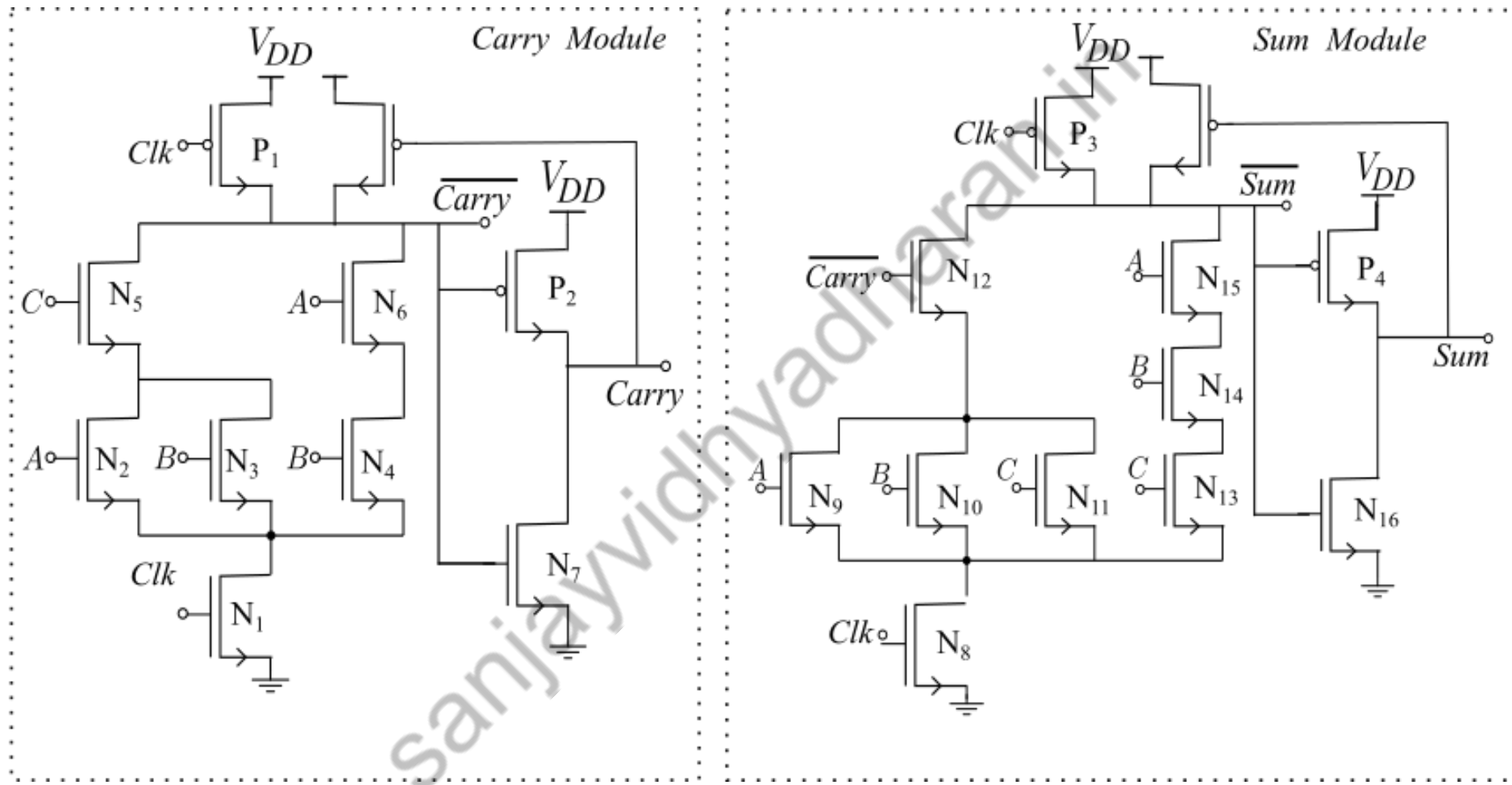


Domino Logic

➤ Cascading Domino Logic



Domino Logic



22T Domino Full Adder

Thankyou

sanjayvidhyasadhan.in