



### Electronics exam– Transistor MOS and logic functions

[SI-S4-ELEC-4-TMOS]

*Calculators and documents are forbidden. Scoring scale is given as a guide  
Answers exclusively on the subject. If you need more space, you can use the back of the pages.*

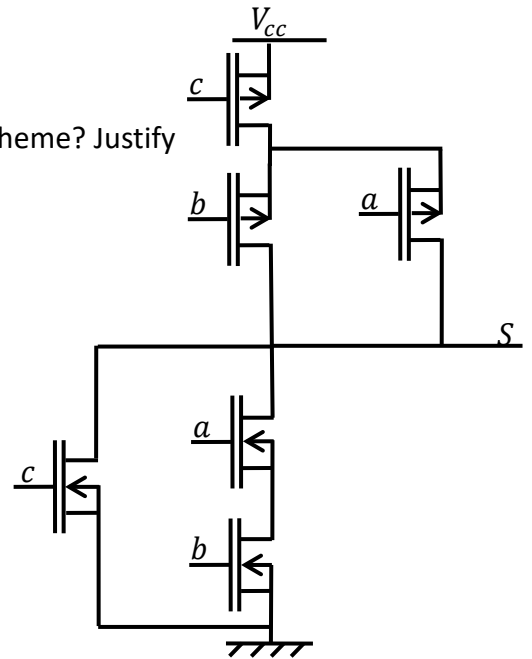
**Q1.** (2 points)

Recall the pass (Drain Source channel conductive) and block (Drain Source channel not conductive) conditions for N and P Channel MOSFETs

**Q2.**(4 points)

Consider the scheme on the opposite.

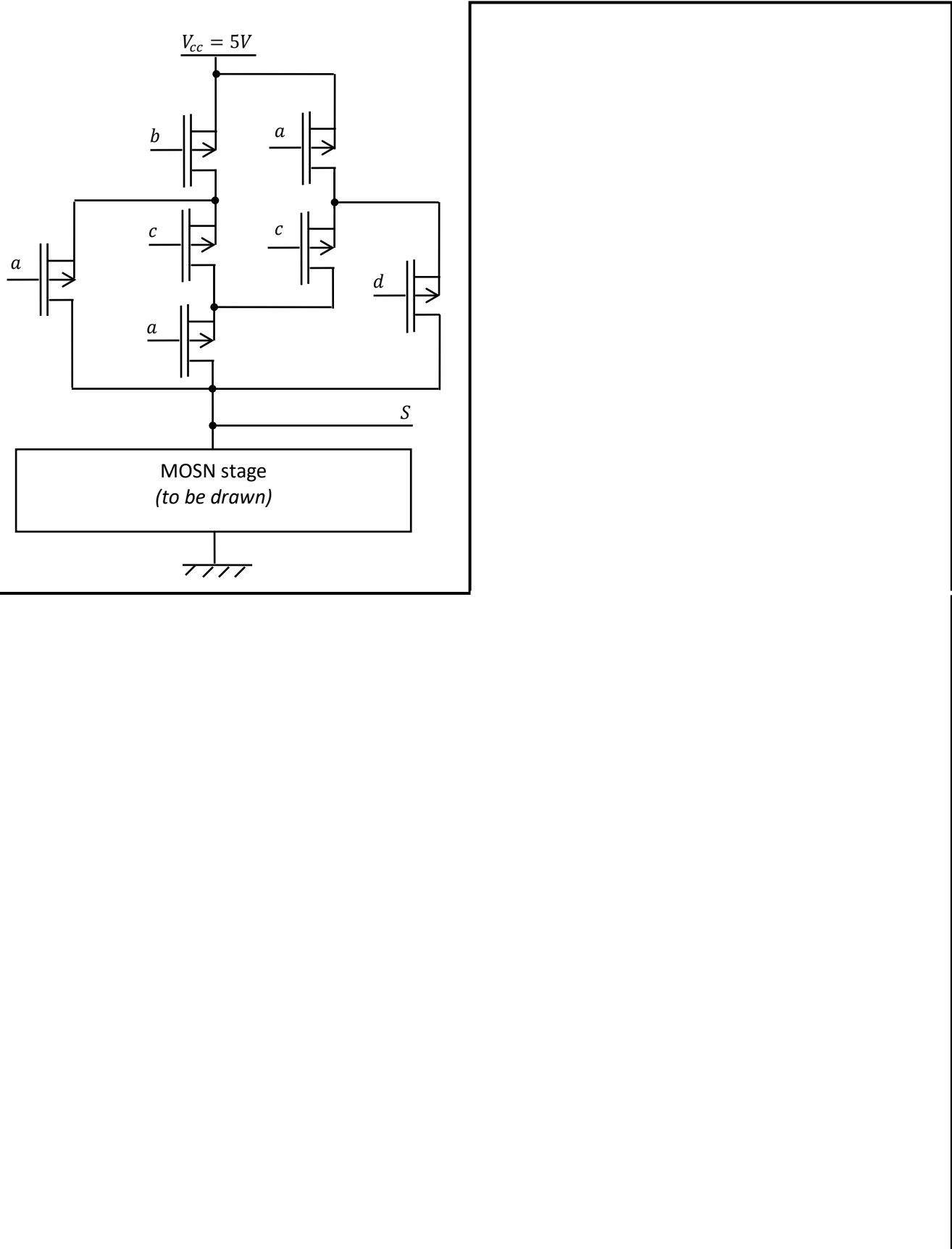
What is the expression of the logic function realized by this scheme? Justify your answer.



**Q3.**(7 points)

Consider the following diagram: It corresponds to a logic function realized in CMOS technology.

Determine the logic equation corresponding to this function (justify your answer), then, after simplifying this equation), redraw the FULL scheme of this logic gate including the MOSN stage, undrawn in the initial scheme.



**Q4.**(7 points)

Consider the following diagram: It corresponds to a logic function realized in CMOS technology.

Determine the logic equation corresponding to this function (justify your answer), then, after simplifying this equation, redraw the FULL scheme of this logic gate including the MOSP stage, undrawn in the initial scheme

