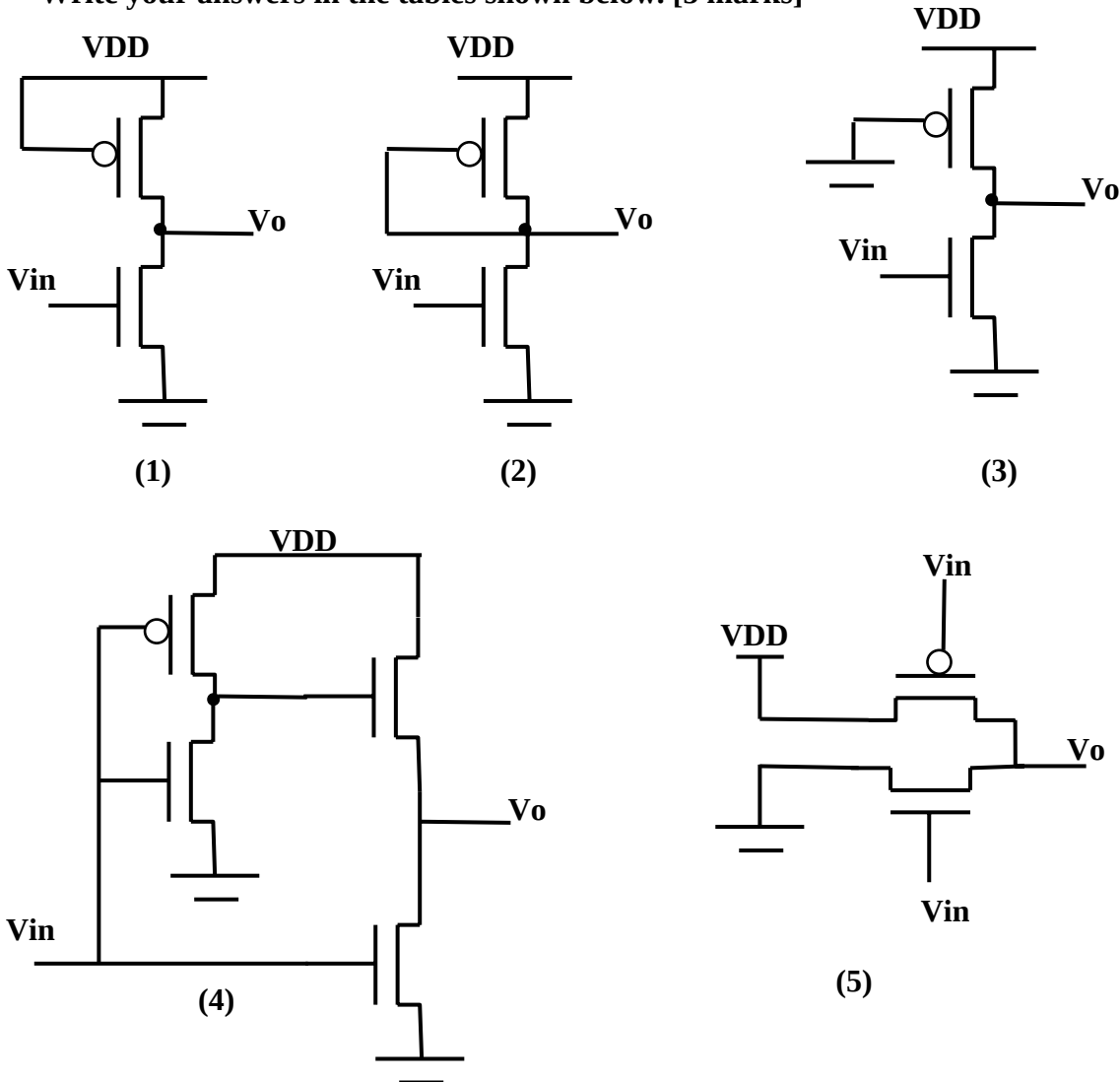


COE360 – Assignment # 4 (Out of 20)
Dr. M. Elrabaa (061)

Q1) Explain which of the following circuits can be used as an inverter? [5 marks]

If more than one circuit can be used as an inverter, which one is the best in terms of speed, which one the best in terms of power and which one is the best in terms area? Explain Why?

Write your answers in the tables shown below. [5 marks]



Circuit	Inverter (Yes/No)	Explanation
1		
2		
3		
4		
5		

Property	Best Circuit	Explanation
Speed		
Power		
Area		

Q2) The following is the Pull-Down block of a CMOS gate:

1. Write down the Boolean function implemented by this gate [3 marks]
2. Complete the circuit schematic by drawing the PU (PMOS) block [2 marks]
3. Calculate the minimum required sizes of all transistors in this circuit (i.e. design the circuit) using the 1 μ m, 5V technology (from the cheat sheet) such that the circuit can operate at 2 GHz at a load capacitance of 50 fF with equal rise and fall delays, symmetrical noise margins and equal path delays. [5 marks]

