

1. Explain what is meant by a PN junction, and explain why it will conduct electricity in only one direction.
2. Explain what is meant by a MOSFET and explain how it works.
3. Draw the transistor diagram of a CMOS NOT gate, and explain why it works.
4. Draw the layout of a 3-Input CMOS NOR Gate.
5. Show the vertical constraint graph for the following channel.

1	4	3	7	10	7	8	7	2	0	0	9	4	5	6	6
2	3	8	10	0	3	8	10	3	9	5	0	8	4	0	4

6. Show the routing for the following channel. Use the left-edge algorithm.

10	8	1	5	10	5	1	3	9	2	5	0	6	3	5	4	7	8
10	9	1	4	9	4	2	2	6	4	6	3	7	2	6	7	7	0

7. We want to partition the following circuit into two equally-sized pieces. The initial partition is {1,2,3,4} {5,6,7,8} For each gate, show the gain. Show the gain for each pair of gates. Remember that the gain for a gate is the reduction in the total nets that will be cut if we move the gate from one set to the other. The gain for a pair is the reduction in total nets that are cut when we swap the pair of gates.

