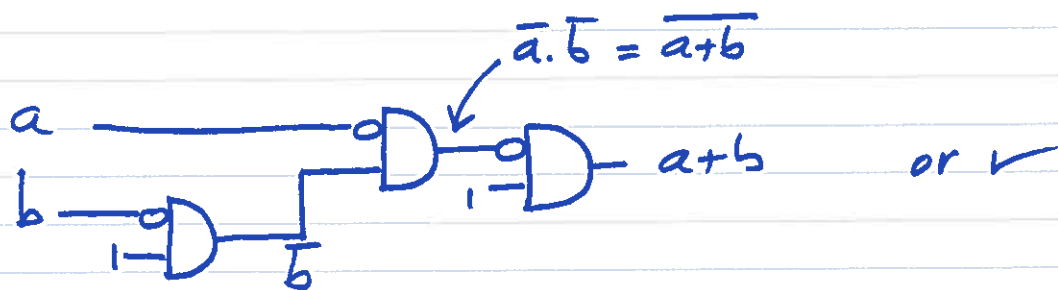
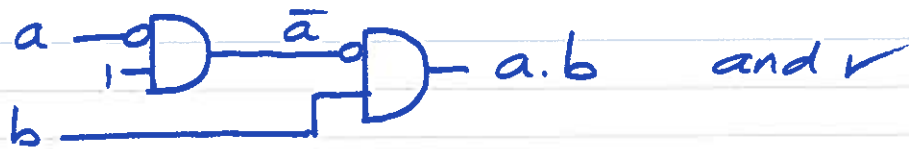
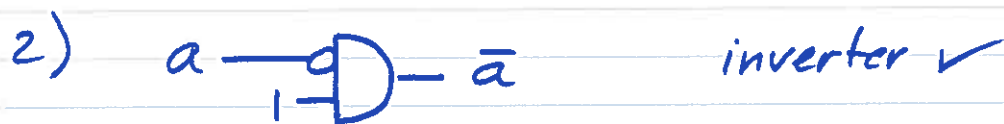


HW#2 Solutions

CSC270
2012
DT

1) The XOR is not a universal gate. You can implement an inverter but not an and or an or gate.

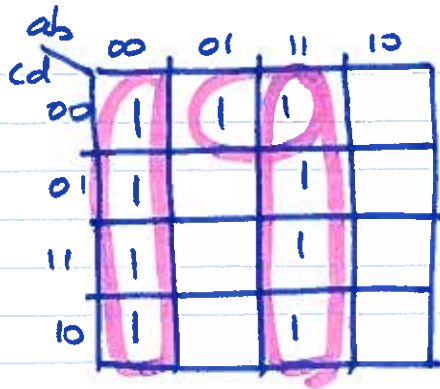


the gate is a universal gate

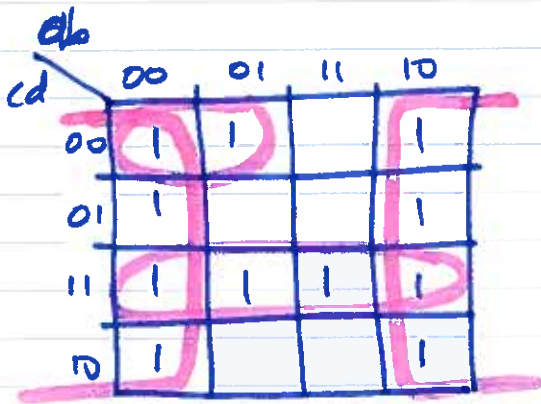
$$3) f = \sum(1, 2, 13, 14, 15) = \prod(0, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)$$

$$g = \prod(0, 1, 2, 3, 4, 5, 6, 7) = \sum(\quad) = 0$$

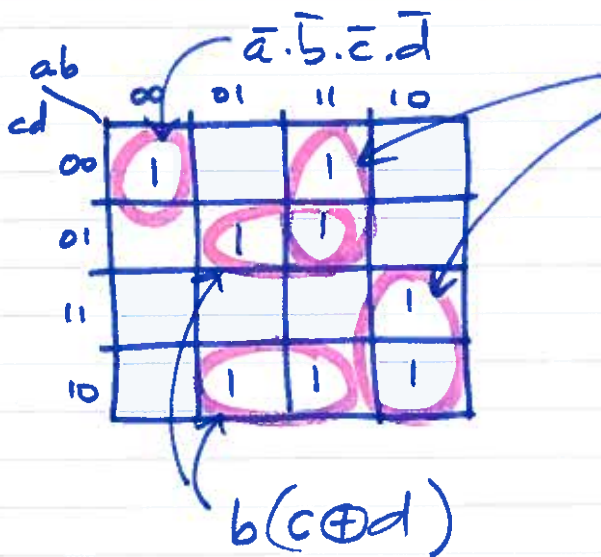
4)



$$f = \overline{a} \oplus b + b \overline{c} \overline{d}$$



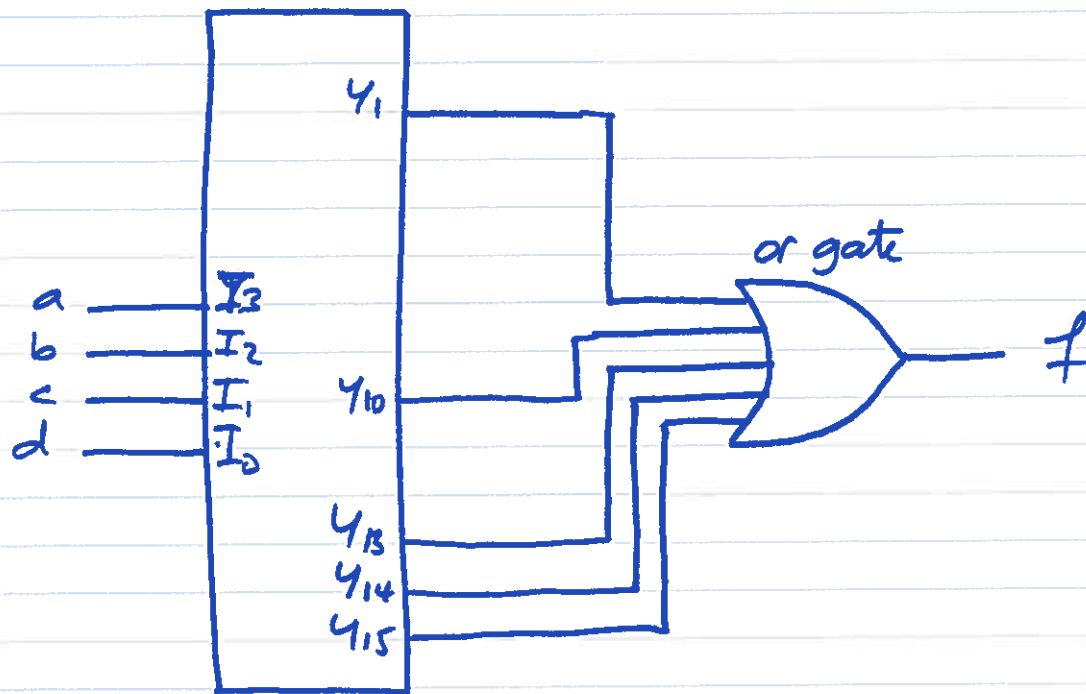
$$g = \overline{b} + cd + \overline{a} \overline{c} \overline{d}$$



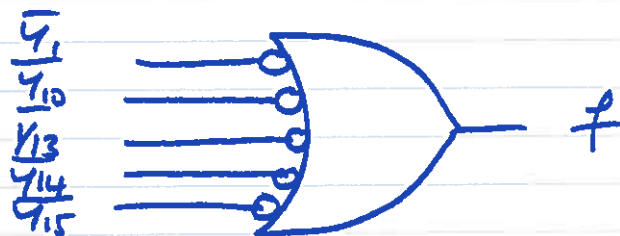
$$a(b \oplus c)$$

$$h = \overline{a} \cdot \overline{b} \cdot \overline{c} \cdot \overline{d} + a \cdot (b \oplus c) + b(c \oplus d)$$

5) A decoder with active-high outputs generates all the minterms of the inputs.



if the decoder has active low outputs, use a nand instead of the or gate.



6)

