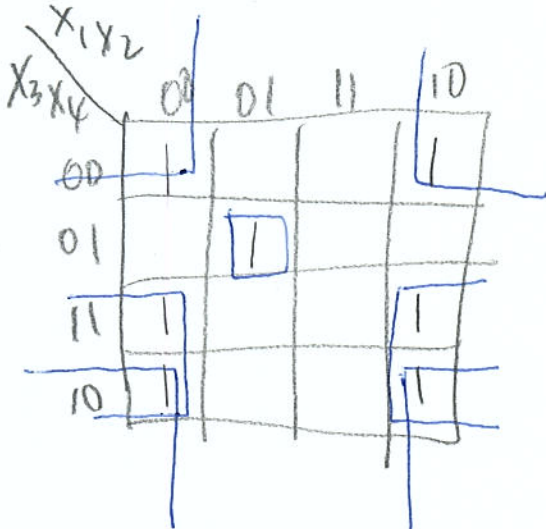


Boise State University  
Department of Electrical and Computer Engineering  
ECE 230 Digital Systems  
Quiz 3 – September 10, 2010

Name: \_\_\_\_\_

*Kay*

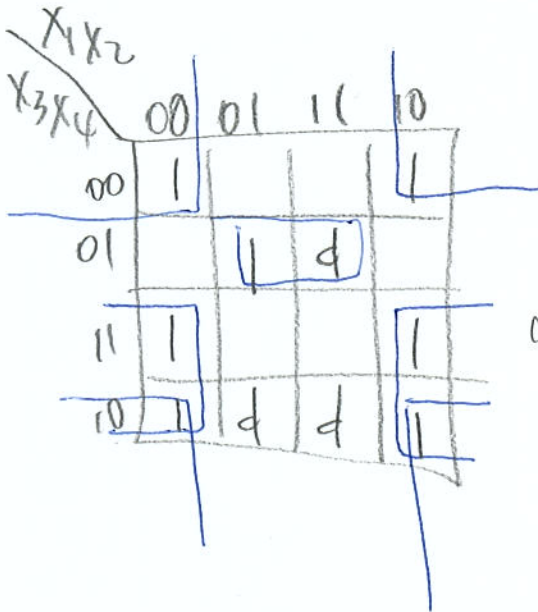
1. Find the simplest circuit that implement function  $f(x_1, x_2, x_3, x_4) = \sum m(0, 2, 3, 5, 8, 10, 11)$  using K-map.



$$f = \bar{x}_2 \bar{x}_4 + \bar{x}_2 x_3 + \bar{x}_1 x_2 \bar{x}_3 x_4$$

$$\begin{aligned} \text{cost} &= \text{inputs} + \text{gates} \\ &= 11 + 4 = 15 \end{aligned}$$

2. Find the simplest circuit that implement function  $f(x_1, x_2, x_3, x_4) = \sum m(0, 2, 3, 5, 8, 10, 11) + D(6, 13, 14)$  using K-map.



$$f = \bar{x}_2 \bar{x}_4 + \bar{x}_2 x_3 + x_2 \bar{x}_3 x_4$$

$$\text{cost} = 10 + 4 = 14$$