

## CSE 311 Quiz Section: April 11, 2013

### 1. Sum-Of-Products

Find the sum-of-products expansion of the Boolean function  $F(w,x,y,z)$  that has the value 1 if and only if an odd number of  $w, x, y, z$  have value 1.

### 2. Circuits

Construct circuits from inverters, AND gates, and OR gates to produce these outputs. Can you simplify any of them? (Note: A bar above an expression means its negation.)

- (a)  $\bar{x} + y$
- (b)  $xyz + \bar{x}y$
- (c)  $(\overline{x + y})(\overline{y + z})(\overline{x + z})$

### 3. Translation with Quantifiers

Let  $L(x, y)$  be the statement “ $x$  loves  $y$ .” Let the domain for both  $x$  and  $y$  consist of all people in the world.

- (a) There is somebody whom everybody loves.
- (b) Nobody loves everybody.
- (c) Everyone loves himself or herself.
- (d) There is someone who loves no one besides himself or herself.