CSE 320 Spring 2013

Computer Project #4 -- Sequential Circuits

a) Give your name, MSU PID and sequence derived from your MSU PID.

Name:

MSU PID:

Derived sequence:

b) Complete the following truth tables to describe the Boolean functions which form the basis for your circuits. For each function, replace the hyphens with the appropriate entry (0, 1 or d), where ’d’ represents the "don’t care" condition.

| Current | | | | Next | | | |
|---|---|---|---|---|---|---|---|
| w | x | y | z | W() | X() | Y() | Z() |
| 0 | 0 | 0 | 0 | - | - | - | - |
| 0 | 0 | 0 | 1 | - | - | - | - |
| 0 | 0 | 1 | 0 | - | - | - | - |
| 0 | 0 | 1 | 1 | - | - | - | - |
| 0 | 1 | 0 | 0 | - | - | - | - |
| 0 | 1 | 0 | 1 | - | - | - | - |
| 0 | 1 | 1 | 0 | - | - | - | - |
| 0 | 1 | 1 | 1 | - | - | - | - |
| 1 | 0 | 0 | 0 | - | - | - | - |
| 1 | 0 | 0 | 1 | - | - | - | - |
| 1 | 0 | 1 | 0 | - | - | - | - |
| 1 | 0 | 1 | 1 | - | - | - | - |
| 1 | 1 | 0 | 0 | - | - | - | - |
| 1 | 1 | 0 | 1 | - | - | - | - |
| 1 | 1 | 1 | 0 | - | - | - | - |
| 1 | 1 | 1 | 1 | - | - | - | - |

c) Complete the following Karnaugh maps for your Boolean functions. For each input combination, replace the hyphen with the appropriate entry (0, 1 or d).

| W() | y’z’ | y’z | yz | yz’ |
|---|---|---|---|---|
| w’x’ | - | - | - | - |
| w’x | - | - | - | - |
| wx | - | - | - | - |
| wx’ | - | - | - | - |

| X() | y’z’ | y’z | yz | yz’ |
|---|---|---|---|---|
| w’x’ | - | - | - | - |
| w’x | - | - | - | - |
| wx | - | - | - | - |
| wx’ | - | - | - | - |

| Y() | y’z’ | y’z | yz | yz’ |
|---|---|---|---|---|
| w’x’ | - | - | - | - |
| w’x | - | - | - | - |
| wx | - | - | - | - |
| wx’ | - | - | - | - |

| Z() | y’z’ | y’z | yz | yz’ |
|---|---|---|---|---|
| w’x’ | - | - | - | - |
| w’x | - | - | - | - |
| wx | - | - | - | - |
| wx’ | - | - | - | - |

d) Give the minimized (simplified) expression for each of the Boolean functions.

W(w,x,y,z) =

X(w,x,y,z) =

Y(w,x,y,z) =

Z(w,x,y,z) =