

Name and MSU PID:

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

	w	x	y	z	Valid	Present	Even	Prime
0	0	0	0	0	-	-	-	-
1	0	0	0	1	-	-	-	-
2	0	0	1	0	-	-	-	-
3	0	0	1	1	-	-	-	-
4	0	1	0	0	-	-	-	-
5	0	1	0	1	-	-	-	-
6	0	1	1	0	-	-	-	-
7	0	1	1	1	-	-	-	-
8	1	0	0	0	-	-	-	-
9	1	0	0	1	-	-	-	-
A	1	0	1	0	-	-	-	-
B	1	0	1	1	-	-	-	-
C	1	1	0	0	-	-	-	-
D	1	1	0	1	-	-	-	-
E	1	1	1	0	-	-	-	-
F	1	1	1	1	-	-	-	-

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

Valid	y'z'	y'z	yz	yz'
w'x'	-	-	-	-
w'x	-	-	-	-
wx	-	-	-	-
wx'	-	-	-	-

Present	y'z'	y'z	yz	yz'
w'x'	-	-	-	-
w'x	-	-	-	-
wx	-	-	-	-
wx'	-	-	-	-

Even	y'z'	y'z	yz	yz'
w'x'	-	-	-	-
w'x	-	-	-	-
wx	-	-	-	-
wx'	-	-	-	-

Prime	y'z'	y'z	yz	yz'
w'x'	-	-	-	-
w'x	-	-	-	-
wx	-	-	-	-
wx'	-	-	-	-

c) Give the minimized expression for each Boolean function.

Valid(w,x,y,z) =

Present(w,x,y,z) =

Even(w,x,y,z) =

Prime(w,x,y,z) =