

Homework #6
Due Tu. 10/26

Note: Do not use a calculator or computer to complete the following exercises. You must show all your work and put a box around your final answer to receive credit. Messy or unreadable submissions will receive no credit.

Homework will only be accepted at the beginning of class and all pages must be stapled together.

Total Points: 111

1. (0 points) How long did it take you to complete the homework? This will not affect your grade (unless omitted) but it helps gauge the workload for this and future semesters. If you do not answer this question you will get -5 points.
2. (12 points) Use a Karnaugh map to minimize the following functions. Assume Y is the output and all other variables are inputs and express your final answer in minimized SOP and POS form.

(a) (6 points)

A	B	C	Y
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

(b) (6 points)

A	B	C	Y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

3. (19 points) Use a Karnaugh map to minimize the following functions. Express the output in minimized SOP form only. The terms in parenthesis indicate the input variable names.
 - (a) (3 points) $F(A, B, C) = \sum m(1, 5) + \sum d(2, 7)$
 - (b) (3 points) $G(A, B, C) = \sum m(0, 2, 4) + \sum d(1, 3)$
 - (c) (8 points) Construct a truth table which encodes each month in its natural binary encoding (e.g. 0000 = January, 0001 = February, etc.). The boolean output signal H is considered true if the month contains a school holiday (Labor Day, Nevada Day, Veterans Day, Thanksgiving, and Washington's Birthday (February), Spring Break (March)). Find the simplified expression making use of "don't cares" where appropriate.
 - (d) (5 points) $J(A, B, C, D, E) = \sum m(0, 3, 4, 7, 8, 12, 14, 16, 19, 20, 23, 24, 26, 28)$
4. (80 points) Hand's On Assignment 1 [\[link\]](#)