Due: Thursday, November 13, 2003

1. (10 points) Question A.12, page 494, Murdocca & Heuring
2. (10 points) Question A.16, page 495, Murdocca & Heuring
3. (10 points) Question A.17, page 495, Murdocca & Heuring
4. (50 points) In the following, the notation $\sum m(x_1, \ldots, x_j)$ indicates a Boolean function that is the sum of the minterms $x_1, \ldots, x_j$, where x_i is the ith minterm in canonical ordering — i.e., the ith row of the truth table where the input values are ordered as binary numbers. Similarly,

$$\sum m(x_1, \ldots, x_j) + d(y_1, \ldots, y_k)$$

indicates a Boolean function that is the sum of the minterms $x_1, \ldots, x_j$ and whose values for rows $y_1, \ldots, y_k$ of the truth table are *don't cares.*

Minimize the following functions using Karnaugh maps. Then, write down a Boolean formula in sum-of-products or product-of-sums form for each function. Show your work (including the Karnaugh maps).

(a) $f(A, B, C) = \sum m(2, 3, 4, 5)$
(b) $f(A, B, C, D) = \sum m(0, 1, 4, 6, 9, 13, 14, 15)$
(c) $f(A, B, C, D) = \sum m(0, 1, 2, 8, 9, 10, 11, 12, 13, 14, 15)$
(d) $f(A, B, C, D) = \sum m(2, 9, 10, 12, 13) + d(1, 5, 14)$
(e) $f(A, B, C, D) = \sum m(1, 3, 6, 7) + d(4, 9, 11)$