University of Maryland Baltimore County
Department of Computer Science and Electrical Engineering

CMPE 212, Digital Systems Design

Assignment #3 Due: Mon 3/7/2016 in the class

Question 1: *(10 Points)*

Plot the following functions on the Karnaugh map.

$$f(A,B,C,D,E) = \bar{B}\bar{C}D + \bar{A}B\bar{C}E + AB\bar{D}+\mathrm{A}\bar{E}$$

Question 2: *(30 Points)*

Minimize the following functions using the K-map.

(a) $f(A,B,C) = \sum m(0,1,5,7)$ *(5 pts)*

(b) $f(A,B,C,D) = \sum m(0,1,2,6,8,9,10,12,13,15)$ *(10 pts)*

(c) $f(A,B,C,D,E) = \sum m(1,3,4,6,9,11,13,15,18,25,26,27,29,30)$ *(15 pts)*

Question 3: *(30 Points)*

Minimize the following functions containing don't-cares using the K-map.

(a) $f(A,B,C,D) = \sum m(1,5,6,7) + d(2,9,11)$

(b) $f(A,B,C,D,E) = \sum m(5,6,13,15,18,26,27,31) + d(4,9,11,23,28)$

Question 4: *(30 Points)*

Use a K-map to find the following forms of the given switching functions:

(a) Canonical SOP form (b) Canonical POS form

i. $f(A,B,C,D) = (C + \bar{B})(A + \bar{D})(\bar{A} + C)$

ii. $f(A,B,C,D) = A\bar{B}D + \bar{A}C + B\bar{C}\bar{D}$