

ECE 465, Spring 2005, Instructor: Prof. Shantanu Dutt

Homework 1 : Due Thurs, Feb. 17

1. Prob. 3.58 with the requirement that the least-cost set of PIs to cover all minterms should be determined using Petrick's algorithm and not the PI table part of QM; the set of all PIs are, however, to be determined using the first stage of the QM method. **50**

2. Prob. 3.60. Note that there should be a fifth variable E for the two functions for this problem (there is a typo in the text and only four variables A, B, C, D are given). **60**

3. Prob. 3.63 **80**

4. (a) Devise a method, similar to the (single-function) QM method for **directly** obtaining a minimal POS expression of a function that may have don't cares. Write down the steps of your method clearly along with reduction rules and heuristics for obtaining a minimal-cost solution. **60**
 (b) Using the method you have developed in part (a), obtain a minimal POS expression for the following functions.
 - (i) $f(A, B, C, D) = \prod M(0, 1, 5, 7, 9, 11, 12, 14)$ **25**
 - (ii) $f(A, B, C, D, E) = \prod M(0, 5, 6, 9, 21, 28, 31) \cdot D(2, 12, 13, 14, 15, 25, 26)$ **45**