11.10.2013

Istanbul Technical University
Department of Computer Engineering

BLG 231E - Digital Circuits
Assignment 3

Due Date: 21.10.2013**, Monday,** 17.00.

- Please **write and draw neatly**.
- If you are not preparing your homework in a computer, please show complement of a symbol by putting a **dash** over the symbol (e.g. do not use *x'* use $\bar{x}$).
- Plagiarized assignments will be given a negative mark.
- **No late submissions** will be accepted.

Submissions: Please submit your solutions to the Digital Circuits Course Assignment Box at the department secretary's office.

1. Find **all** prime implicants of the following function by using Kaurnaugh Maps.

$$f(a,b,c,d) = \cup_1(1,4,6,7,8,9,12,13,14) + \cup_\Phi(5,10)$$

2. Create the prime implicant chart of the above function according to the given cost criteria and simplify it. Explain **each** step of the simplification. Write the expression of the function with the least cost and give the total cost.

Cost criteria: 2 units for each variable and 1 unit for each complement.

3. Draw the least cost expression of the function using **only** NAND gates.