15.10.2015

Istanbul Technical University
Department of Computer Engineering

BLG 231E - Digital Circuits
Assignment 2

Due Date: 22.10.2015, **Thursday,** 17.00.

- Please **write <u>neatly</u>**.
- 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 $\bar{x}$).
- **Consequences of plagiarism:** Disciplinary regulations of The Council of Higher Education and of the university are applied.
- **No late submissions** will be accepted.

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

Two logical expressions (***f*** and ***g***) have been given as follows

$$f(a,b,c,d) = \sum m(0,1,2,3,10,11)$$

$$g(a,b,c,d) = \prod M(1,3,5,7,12,14)$$

i. Write the first and the second canonical forms for both expressions (***f*** and ***g***).

ii. Calculate the logical expressions for $f + g$ and $f \cdot g$.

iii. Write SoP *(sum of product*s) for the expressions $f + g$ and $f \cdot g$.

iv. Simplify the logical expression $(f + g)$ by using PoS (*product of sums*) form.

v. Draw the circuit design for the expression found in **iv**.