

## EHB205 Introduction to Logic Design

### 1st Homework

#### Part 1

1. Convert the hexadecimal number  $64CD_{16}$  to binary, to octal and decimal.
2. Convert the decimal number 431 to binary, hexadecimal and octal.
3. Express the following numbers in decimal:
  - a.  $(10110.0101)_2$
  - b.  $(16.5)_{16}$
  - c.  $(26.24)_8$
  - d.  $(DADA.B)_{16}$
  - e.  $(1010.1101)_2$
4. Convert the following binary numbers to hexadecimal and to decimal:
  - a. 1.10010
  - b. 110.010. Explain why the decimal answer in (b) is 4 times that in (a).
5. Draw truth table of the Boolean function  $f(x,y,z)=x'y+z$ .

#### Part 2

1. Get Xilinx ISE 14.7 webpack from <https://www.xilinx.com/support/download.html>. Install to your computer.
2. Take "OR\_gate.vhd" and "OR\_gate\_tb.vhd" files from ninova.
3. Start "Project Navigator" in "ISE Design Tools" in Xilinx ISE.
4. Build a new project by "New Project" command. Give a name to your project.
5. Add the files mentioned above by "Add Source" command in "Project" tab.
6. When the option is "view" "implementation" and "OR\_gate.vhd" is chosen, view your circuits schematic by "view RTL schematic" in "Synthesize" list. Take the picture in order to use in your homework report.
7. Choose "view" "Simulation" option.
8. When "OR\_gate\_tb.vhd" file is chosen, push "Simulate Behavioral Model" command. You should see a graph with inputs and outputs. Take a picture of this graph between 0 ns – 60 ns for your homework report.
9. Prepare a report which shows that you successfully completed all the above steps.

#### Kaynaklar

- 1) Morris Mano, Micheal Ciletti, Digital Design, Fifth Edition, Pearson.
- 2) Frank Vahid, Digital design, with RTL design, VHDL, and Verilog, Hoboken, NJ : John Wiley, 2010
- 3) Peter D Minns, FSM-based digital design using Verilog HDL, Chichester, England : J. Wiley & Sons , c2008
- 4) Pong P. Chu, FPGA prototyping by Verilog examples Xilinx Spartan -3 version, Hoboken, N.J. : J. Wiley & Sons, c2008