Department of Computer Science and Engineering. NITK, Surathkal

CS203 – Design of Digital Systems Lab

Assignment 2

Simulate the listed experiments on LogiSim (https://sourceforge.net/projects/circuit/).

Instructions:

1. Assignment is to be completed in teams of 2. One submission per team.
2. Submission: Create a directory with the registration numbers of your team. Eg. 18CO201-202. Inside,
    a. place a README with your identification info (name, reg. No. etc., ...).
    b. Create one directory per question. Put your code, screenshots, etc. inside the directory.
3. Pack the parent directory and send to cs201.nitk@gmail.com. Deadline: September 11, 9AM.

Experiments to Simulate on LogiSim (Module III)

1. Verify the truth tables for the following gates: AND, OR, NOT, NAND, NOR, XOR, XNOR.
2. Implement all the gates in Q1 using universal gates (NANDs and NORs)
3. Find r's and (r-1)'s complement of a given number using Universal gates only.
4. Implement
    a. Gray code to Binary code and vice versa.
    b. Excess-3 to BCD code and vice versa.
    c. Output binary number equal to the square of the input number.
    d. 9's complement of decimal equivalent of BCD.
5. Implement (i) Half Adder (ii) Half Subtractor (iii) Full Adder (iv) Full Subtractor
6. Implement
    a. 4-bit adder using decoder
    b. 4-bit adder using multiplexer
    c. 4-bit subtractor using decoder
    d. 4-bit subtractor using multiplexer