Birzeit University
Faculty of Engineering and Technology
Department of Electrical and Computer Engineering
First Semester – 2023/2024
ENCS2340 - Digital Systems
Homework # 2

Student name:

Student ID:

Notes:

1- Use this page as a cover for your homework.
2- Late homeworks will not be accepted (the system will not allow it).
3- Due date is Wednesday January 17, 2024at 11:59 pm on ritaj.
4- Organize your solution for each question (Q1, Q2, etc.) and add them to one file. Then, name you file as (Assign2_LastName_FirstName_StudetnsID.pdf).

Q1 **(10 points):** Design a combinational circuit with three inputs, x, y and z, and the three outputs, A, B, and C. when the binary input is 0, 1, 2, or 3, the binary output is one greater than the input. When the binary input is 4, 5, 6, or 7, the binary output is one less than the input.

Q2 **(5 points):** Implement the Boolean function **F(A,B,C) = AB + A'C + A'B'**
Using a single 4x1 multiplexer.

Q3 **(5 points):** Implement the same function in **Q2** using the minimum number of 2x4 decoders with enable and a single NOR gate.

Q4 **(10 points):** Implement the following function F(A,B,C,D) = ∑(0, 2, 4, 6, 8, 10) using

a. Mux 4×1
b. Decoders 3-to-8
c. AND-OR
d. NAND-NAND

Q5 **(6 points):** In the following function determine the Essential prime implicant
F(A,B,C,D) = Σ (0,2,5,7,6,8.9,10,11,13,14,15)

Q6 **(4 points):** Explain the concept of odd parity generator?