North South University
Department of Electrical and Computer Engineering
Fall-2020, CSE231L Midterm
CSE231 Digital Logic Design, Section-8
Faculty-Shahriar Hossain (HSM)
Instructor-Md. Anisur Rahman Asif

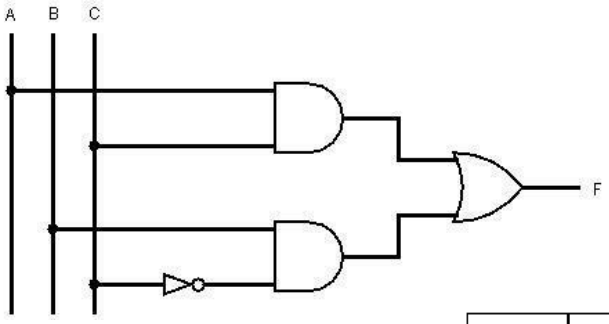
Total Marks: 30 **Time: 30 minutes**

Instructions:

1. Answer all the questions.
2. Clearly label all the diagrams and truth tables.
3. Write **Page number** and your **Name and ID** on each page.

Questions:

1. Write T (true) or F (false) for each of these Boolean equations: [2]
   a. T F $A' \oplus B' = A \oplus B$
   b. T F $(A + B + C)' = A'B'C'$
2. Answer the following questions: [8]
   a. Write down the names of the following postulates:
      a. A+(B+C) = (A+B)+C b. (A′)′ = A
   b. What does it mean by 74HC04N written on top of a 14 pin IC?
   c. What is the full form of TTL?
   d. How many input combinations would a truth table have for a six-input AND gate?
3. Draw the following combinational circuit using **only NOR gates**: [4]



4. a) Consider an Excess-4 system that adds 4 to the corresponding Decimal digits. Complete the values of BCD and Excess-4 in Table-1 for the given Decimal Digits: [4]

   b) Considering W,X,Y,Z as input variables and A,B,C,D as output variables, draw K-maps to find the **minimal 1st canonical functions** for each output variable. [4+4]

   c) Draw the circuit diagram for the equations found in question 5-b. [4]

Decimal Digit	Binary Coded Decimal (BCD)				Excess-4			
	W	X	Y	Z	A	B	C	D
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								

Table-1