

Wentworth Institute Of Technology
Department Of Computer Science
Computer Architecture COMP278
Final

Name: _____

The exam consists of 3 parts and the parts A , B and C are compulsory questions that need to be answered for credit. Please draw all the appropriate diagrams and table associated with the questions given to receive full credit. Please keep your answers to the point and write legibility.

Please show all your work for full credit.

Note: *What I cannot Read, I cannot Grade!!*

All the Best!

Part A:
True or False?

1. All numbers are by default unsigned.
2. A full adder adds is a combination of two half adders.
3. The difference between a SLC and a CLC is feedback.
4. A DeMUX is similar to a Decoder with an Enable and the MUX to the encoder.
5. A latch is a sequential logic circuit.

Fill in the Blanks:

1. The associative law is _____
2. What is the complement of (A')' _____
3. What is the 2's complement of $(10101100)_2$
4. In data communication all messages sent from the transmitter to the receiver are governed by guidelines called _____.

5. Draw a Master-Slave flip-flop. How does it work?

Part B:

Answer the following:

1. Convert the following numbers to decimal;
 - a. $(123)_{16}$
 - b. $(1234)_8$
 - c. $(1011011011)_2$

2. Explain briefly the working of the Multiplier. No truth table necessary.

3. Explain Priority encoding.

4. Simplify the following:

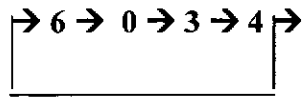
$$f = AB + \overline{A}B\overline{C} + \overline{A}\overline{B} + \overline{A}B C$$

5. Convert the following decimal numbers to the bases indicated.

- a. 7562 to hexadecimal
- b. 11938 to hexadecimal
- c. 175 to binary
- d. 3886 to octal
- e. 4455 to octal

Part C:

1. What is a Flip Flop? Design the following counter.



2. What is the value of \bar{F} ? Complement F using DeMorgan's Laws.

$$\bar{f} = \bar{X}Y (X\bar{Y} + XYZ + Y\bar{Z})$$