CSE 305 (Computer Architecture)

January 2021

Class Test 1

Full Time: 25 minutes (including upload time) **Full Marks: 20**

Instructions

1. In this class test, you have to
   i. Write down the answers in a paper,
   ii. Scan the paper using mobile camera/any other scanner,
   iii. Convert the scanned image to a pdf,
   iv. Rename the pdf with your student id, and
   v. Finally, upload the pdf to the Moodle.

2. Write down your student id and name first.
3. It is a closed book exam. DO NOT copy from any other person or source. Be fair. Be honest.
4. See the format in the following page.

Questions:

<table>
<tr><td>1.</td><td>A program contains 3 multiplication instructions and 2 addition instructions. Based on this program, compare the performance of computer A and computer B where

a. In computer A, each multiplication instruction requires 3 clock cycles and each addition instruction requires 2 clock cycles. The cycle time of computer A is 500ps.
b. In computer B, each multiplication instruction requires 4 clock cycles and each addition instruction requires 1 clock cycle. The cycle time of computer B is 450ps.</td><td>(8)</td></tr>
<tr><td>2.</td><td>Derive the input equations (X_i, Y_i and Z_i) for the parallel adders to be used in the ALU which satisfies the following functional design specification.

<table>
<tr><th>S_2</th><th>S_1</th><th>C_{in}</th><th>Required Functions</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>$F = AB + C$</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>$F = AB + C + 1$</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>$F = AB$</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>$F = AB + 1$</td></tr>
<tr><td>1</td><td>0</td><td>x</td><td>$F = (AB)'$</td></tr>
<tr><td>1</td><td>1</td><td>x</td><td>$F = AB$</td></tr>
</table>
</td><td>(12)</td></tr>
</table>

Answer Script Format:

Student ID: Name:

Answer to the Question 1

Answer to the Question 2