

# COMP.CE.320-2020-2021-1 High-level Synthesis exam

## 1. explain concepts (6p)

- a) blocking read
- b) conditional IO
- c) scheduling

## 2. essay: conditional vs unconditional IO (6p)

## 3. find problems/inefficiencies from code (3p), fix them without breaking synthesis constraints (3p)

a & b are arrays of size 4.

synthesis constraints:

- pipelining  $|| = 1$
- no loop unrolling
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```
1 void addsub(ac_int<4, true> a*, ac_int<4, true> b*, bool add, bool sub) {
2
3     const int MAX = 64;
4
5     ac_int<4, true> acc;
6
7     for (int i=0; i<4; ++i) {
8
9         if (add)
10            acc += a[i] + b[i];
11
12        if (sub)
13            acc += a[i] - b[i];
14    }
15
16    if (acc > MAX)
17        return MAX;
18
19    return acc;
21 }
```