CSE340: Computer Architecture

Assignment 2 [MSDH]

Chapter 2 (Till Non Leaf Procedure)

Total Marks: 15 (Marks are indicated in third brackets after each question)

[CO2] Question 1 [Marks: 5]

Given the following code sequence:

```
for (i = 0; i<10; i++) {
        if (A[i] ! = 5){
                A[B[i]] += 1; }
        else{
                A[i] = B[i+1] ;}}
```

If the base address of arrays A and B are in x8 and x9 respectively and i is in x18, **convert** the above code to its equivalent RISC-V code

[CO2] Question 2 [Marks: 7]

Consider the following code sequence:

```
x = 20;
y = x - 10;
a = 7;
z = y + a;
total = sum(x, y, z);
int sum (x, y, z){
        a = mul(x,y) + z;
        return a;
}
int mul (x, y){
        return x * y;
}
```

Suppose the values a, x, y and z are in x8, x9, x18 and x19 respectively.

Translate the code to its equivalent RISC-V (32-bit) code.

[CO2] Question 3 [Marks: 3]

Let us consider a set of C Code instructions given below. Here, Y is in registers x8, i is in x9 and the base address of A is in register x18. **Convert** the following C Code to its equivalent RISC-V Code using the 64-Bit Architecture and **find** the equivalent Machine Code for each instruction. For values of opcode, funct3, funct7, immediates, please refer to the RISCV Green Card: ***Click Here***

Y = i + A[2i + 4];