

Computer Architecture (CS F342) Quiz-1

Date: 18 September 2021 (Saturday)

Weightage: 5% Mode: Open Book

The question paper contains a total of 6 questions. The duration of the test is 20 minutes.

The exam will start at 4:10 PM and end at 4:30 PM.

Each question carries different points and is mentioned beside each question. Each wrong answer will lead to a negative marking of 25%. Please fill in the student information in the first section and then start answering the questions.

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1. Assume that a system has a spec rating of 120. The spec rating is decided based on 4 floating-point operations. If the (approximate) individual spec-ratio for the programs is in the ratio 1:2:2:4, then the SPEC-RATIO of the system with respect to the second program is (approx.)

2 points

- ☐ 30
- ☐ 32.33
- ☒ 120
- ☐ 36.67

Clear selection

2. Suppose the register \$s0 has the hexadecimal number 0XFFFF FFFF, and \$s1 has the hexadecimal number 0X0000 0000, then the values of the registers \$t0 and \$t1 after the following two instructions will be: slt \$t0, \$s0, \$s1 sltu \$t1, \$s0, \$s1

2 points

- ☐ 0,1
- ☐ 0,0
- ☐ 1,1
- ☒ 1,0

Clear selection



3. Suppose a “for” loop starts at the address location 0x2000 0000 and the starting address has a label “LOOP:” Suppose the loop has 5 instructions, excluding the branch instructions. Then the address that will be substituted in the 2nd branch statement in the loop will be: 2 points

- ☐ 0x18
- ☒ 0x08000000
- ☐ 0x06
- ☐ 0x80000000

Clear selection

4. Two processors A and B have clock frequencies of 500 Mhz and 800 Mhz, respectively. Suppose A can execute an instructions with an average of 3-steps and B can execute with an average of 6-steps. For the execution of the same instruction which processor is faster? 2 points

- ☐ Both have same performance
- ☐ B, 0.667
- ☒ A, 0.8
- ☐ B, 0.8

Clear selection



5. Which of the following instructions do not cause exceptions on overflow?

1 point

- ☐ add, addu
- ☐ sub, subu
- ☐ addi, addu
- ☒ addu, addiu

Clear selection

6. Assume that a program takes 10 seconds to run on a system having 1.66 Ghz clock frequency. The program consumes 8% of execution time on floating-point operation and remaining 92% on integer operations. The integer operations can be parallelized. The maximum speed-up (S_{max}) which can be achieved for the system is

1 point

- ☐ 6
- ☐ 8.33
- ☒ 12.5
- ☐ 5.55

Clear selection

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