Information Technology University, Lahore, Pakistan

BS Computer and Software Engineering

Computer Organization and Assembly Language

Quiz# 7, Spring 2025

Tuesday, May 06, 2025

Name: _____ Roll Number: _____

Maximum Time Allowed: 20 minutes Maximum Marks: 10

Q. 1. A computer has a byte-addressable memory and a cache with the following characteristics: [6]

- Cache size: 4 KB
- Block size: 64 bytes
- Associativity: Direct-mapped
- Address size: 32 bits

For the memory address `0xCAFEDADA`, identify the Tag, Index, and Offset fields values (in hexadecimal).

Q. 2. An array of 10 signed integers is stored starting at memory address `0x10010000`. Write a RISC-V assembly program fragment that does the following: [3+1]

(a) Find the maximum element in the array.

(b) Store the result in register `a0`.

Example: If the array at `0x10010000` is [5, -3, 17, 8, 0, -2, 17, 4, 6, -9], then after execution, `a0` should contain `17`.

Note:

- No need to write complete program (only the program fragment).
- The base address `0x10010000` is already loaded into register `t0`.
- Use `t1, t2, t3,` and `a0` as needed.
- Do not use any system calls or function calls—just straight-line and loop logic.
- Assume all values are 32-bit signed integers.