Name: **Id#**

COE 301/ICS 233, Term 161

Computer Architecture & Assembly Language

Quiz# 1 Solution

Date: Tuesday, Oct. 11, 2016

Q1. Fill the blanks in the following questions:

(1) Assuming 12-bit unsigned representation, the binary number 1111 0000 1111 is equal to the decimal number 3855.

(2) Assuming 12-bit signed 2`s complement representation, the hexadecimal number FC0 is equal to the decimal number -64.

(3) The instruction Pointer (IP) is a register that holds the address of the next instruction to be fetched from memory.

(4) Two main advantages of programming in high-level language are: program development is faster and programs are portable.

(5) Two main advantages of programming in assembly language are: space and time efficiency and accessibility to system hardware.

(6) With a 36-bit address bus and 64-bit data bus, the maximum memory size (assuming byte addressable memory) that can be accessed by a processor is 2^{36}=64GByte and the maximum number of bytes that can be read or written in a single cycle is 8 Bytes.

(7) The bandwidth mismatch between the speed of processor and the speed of main-memory is alleviated by using cache memory.

(8) The advantage of dynamic RAM over static RAM is that it is dense and cheap but the disadvantage is that is slow as it needs refreshing.

(9) The instruction set architecture of a processor consists of the instructions set, the programmer accessible registers and memory.

(10) Assuming that the CPU has just read a 32-bit MIPS instruction from the address 0x00400008. Then, the address of the next instruction that this CPU is going to read is 0x00400008+4=0x0040000c.

(11) Given a magnetic disk with the following properties:

- Time of one rotation is 8 ms
- Average seek = 8 ms, Sector = 512 bytes, Track = 200 sectors

The average time to access a block of 20 consecutive sectors is 8 + 4 + 8*20/200=12.8 ms.