Name: KEY   **Id#**

ICS 233, Term 072

Computer Architecture & Assembly Language

Quiz# 1

Date: Wednesday, Feb. 27, 2008

Q1. Fill the blanks in the following questions:

1. There is a one-to-one correspondence between **assembly language** and **machine language**.

2. Advantages of programming in high-level language are: **program development is faster**, **program maintenance is easier** and **programs are portable**.

3. Advantages of programming in assembly language are: **accessibility to system hardware** and **space and time efficiency**.

4. The processor consists of two main units: **data path unit** and **control unit**.

5. Given an address bus of 20 bits and data bus of 16 bits, the maximum memory size that can be interfaced with the CPU is $2^{20}=1$ **M** bytes and the maximum number of bytes that can be read in a single read/write cycle is **16/8=2** bytes.

6. **Dynamic** RAM is slower than **static** RAM but is denser and cheaper.

7. Given a magnetic disk with Rotation speed = 8000 RPM (rotations per minute)**.** Then, the average rotation latency, i.e. average time to locate a needed sector is:

   Rotations per second= 8000/60=133.33. Time for one rotation in ms= 1000/133.3=7.5 ms. Average rotation latency = 0.5 * 7.5 ms = 3.75 ms.

8. The need for a memory hierarchy is due to **widening speed gap between CPU and main memory.**

9. Cache memory is faster than **random access memory (RAM)** but slower than **registers**.

10. **Instruction Pointer (IP) or Program Counter (PC)** is a register that holds the address of the next instruction to be fetched from memory.

11. Given that a wafer can be diced into 1000 dies, out of which 200 dies are defective. Then, the yield is 800/1000=80%.

12. The **instruction set architecture** is considered as an interface between software and hardware and consists of **instruction set**, **programmer accessible registers** and **main memory**.

13. **Operating system** is a program that manages the resources of a computer for the benefit of the programs that run on that machine.

14. **Compiler** is program that translates from high-level languages to assembly language.

15. **Very Large Scale Integration (VLSI)** is a technology in which a single chip contains hundreds of thousands to millions of transistors.