Assignment 4
(**Due date: 10/14/2009/Wednesday, in class**)

Your name:	Grade:

Important notice on how to submit and grade this assignment:

- Write your answers on **different papers** from the question sheets; otherwise, they will **NOT** be graded.
- You do **NOT** have to write the question text, but you need to **write the question number** for each question.
- Put your solutions in the **same order** as the questions appear on the assignment; otherwise, **missed or misplaced** solutions will **NOT** be graded.
- **How to Grade:**
  - The total score for the assignment is **100** points.
  - **An extra 8%** will be added to the **TYPEWRITTEN** submissions.
  - **3 points will be deducted** from your total score if you **missed any ONE** of the following (this is a *cumulative penalty*, e.g., 9 points will be taken for 1 missed name and 2 missed required blank lines):
    - **Your name** and **assignment number** on the top of each solution sheet/paper,
    - At least **one blank line** between solutions of adjacent questions (**except for** those of *Multiple Choice* or *True/False* questions).

The following questions are taken from the textbook Chapter 5 (p. 142-144).

- **For questions 1 through 23, using A, B, C, D, E, or F as your answers** for each of these questions (you may write text solutions alongside these A, B, …F). **50%** will be deducted if your solutions are **NOT** one of these A, B, …F (even though your texts give the correct answers).
- Do **NOT** use any calculators for the conversion/calculation questions.

- For exercises 1–16, match the power of 10 to its name or use (using **A, B**, … through **I**):

  A. 10^{-12}
  B. 10^{-9}
  C. 10^{-6}
  D. 10^{-3}
  E. 10^{3}
  F. 10^{6}
  G. 10^{9}
  H. 10^{12}
  I. 10^{15}

  1. Nano

  2. Pico

  3. Micro

4. Milli

5. Tera

6. Giga

7. Kilo

8. Mega

12. Latin for “thousand”

13. Spanish for “little”

14. Peta

15. Roughly equivalent to 2^{10}

- For Exercises 17–23, match (using **A, B, .. F**) the acronym with its most accurate definition .

A. CD-ROM
B. CD-DA
C. CD-WORM
D. DVD
E. CD-RW
F. CD

17. Generic compact disk that is recorded during manufacturing

18. Data is stored in the sectors reserved for timing information in another variant

19. Can be read many times, but written after its manufacture only once

20. Can be both read from and written to any number of times

21. Format used in audio recordings

22. There is one tract that spirals from the inside out

23. A newer technology that can store large amounts of multimedia data

- **Exercises 24–64 are problems or short answer exercises.**

24. Define the following terms:

a. Pentium IV processor

b. hertz

c. random access memory

25. What is the word length in the Pentium IV processor?

26. What does it mean to say that a processor is 1.4 GHz?

27. What does it mean to say that memory is 133 MHz?

28. How many bytes of memory are there in the following machines?

a. 128MB machine

b. 256MB machine

29. Define RPM and discuss what it means in terms of speed of access to a disk.

30. What is the stored-program concept, and why is it important?

31. What does "units that process information are separate from the units that store information" mean in terms of a computer architecture?

32. Name the components of a von Neumann machine.

33. What is the addressability of an 8-bit machine?

34. What is the function of the ALU?

35. Which component in the von Neumann architecture acts as the stage manager? Explain.

37. What is an instruction register, and what is its function?

38. What is a program counter, and what is its function?

39. List the steps in the fetch-execute cycle.

40. Explain what is meant by "fetch an instruction."

41. Explain what is meant by "decode an instruction."

42. Explain what is meant by "execute an instruction."

43. Compare and contrast RAM and ROM.

44. What is a secondary storage device, and why are such devices important?

46. Draw one surface of a disk showing the tracks and sectors.

48. What is a cylinder?

51. Describe a parallel architecture that uses synchronous processing.

52. Describe a parallel architecture that uses pipeline processing.

53. How does a shared-memory parallel configuration work?

54. How many different memory locations can a 16-bit processor access?

64. What is the difference between 1K of memory and 1K transfer rate.