Part A: Reading comprehension

1. Based on a literal reading of the first paragraph, which one executes instructions?
   a. the PC – The PC only includes a CPU, but based on a literal reading of the paragraph, it does not execute instructions by itself.
   b. the CPU – According to the paragraph, and based on a literal reading, the CPU is built into a chip, which executes instructions. So, based on a literal reading of the paragraph, the chip executes instructions, not the CPU itself. (of course this would not be true if we were talking about the real meaning of the sentence and not the literal meaning)
   c. the single chip – According to the above, this is a correct answer.
   d. the integrated circuit – The chip has been described in a dash-enclosed nested clause (“a small piece of silicon …”). According to the nested clause, the chip is a small piece of silicon with an electrical circuit, i.e. the integrated circuit. So based on a literal reading of the paragraph, the chip is itself not an integrated circuit (IC), and the IC does not execute instructions itself.

So the only correct answer is choice c. (explanation was not needed, if you had only chosen this choice)

2. Based on a literal reading of the first paragraph, which of the following is true?
   Correct answers have been marked in bold. Refer to the explanations above to understand the rationales.
   a. The processor is the same as the CPU.
   b. The brain of the computer is a small piece of silicon with a complex electrical circuit.
   c. The single chip executes instructions.
   d. The CPU is the same as the chip.
   e. The brain of your computer is the same as the integrated circuit.
   f. The integrated circuit coordinates the activities of all the other units.

3. Which of the following can be inferred from the text?
   Correct answers have been marked in bold. Pointers to text are provided below each sentence. (explanation was not needed)
   a. Disk drives are used in communication of the BIOS with the peripherals.
      According to the second from last paragraph of part B, ROM is used by the BIOS to control communication with peripherals, not disk drives.
   b. The instructions executed by the CPU are fetched from the memory.
      The first bullet point in part A tells us that the control unit, which is a part of the CPU, examines instructions from memory. So we can also infer that the instructions are fetched by the CPU from memory.
c. Expansion cards expand the peripherals to allow for more functionality.

According to the last paragraph of part A, expansion cards expand the motherboard/PC to allow for more functionality, not the peripherals.

d. The front side bus coordinates the activities of units other than the CPU.

According to the second from last paragraph of part A, the front side bus merely carries data from the CPU to other devices; thus it can be inferred that it does not coordinate them.

e. A computer can boot using only a RAM and a CPU.

According to the first paragraph of part B, the RAM is volatile memory, so when a computer needs to boot, no program can be run without using a permanent memory (like ROM and the hard disk), since the RAM is initially empty.

f. The number of concurrent programs which a PC can run is fixed.

While according to the last paragraph of part B, the amount of RAM determines the number of programs that can run simultaneously, it adds that the RAM can be expanded; so the number of concurrent programs which a PC can run, can be expanded as well.

g. Bits are simply representations of each of two states.

From the beginning paragraph of part C, it can be inferred that bits are representations of each of two states.

h. The peripherals are directly connected by internal paths on the motherboard.

According to the second from last paragraph of part A, controllers for peripherals, not the peripherals themselves, are connected by internal buses/paths.

4. Complete the following sentences using vocabulary from Unit 8 left-hand page. Each blank space may contain more than one word.

a. The personal organizer can synchronize your data between your smartphone and your PC.

b. If you are not sure where the program is installed, look for it in the “Program Files” folder.

c. Like the brain in the human body, the CPU is the nerve centre (center) of all kinds of computers.

d. Volatile computer memory is typically faster than non-volatile memory. (Both blanks should be filled with the same word)

e. Once you post something confidential to the internet, the information will be permanently out of your control; even if you delete it from the server, someone else might have downloaded and stored it in the meantime, without you noticing it.

f. Modern software engineering practice requires that security be built into the software from the beginning of software development, and not be regarded as an afterthought which is simply “added” to the software after it is developed. If a software is not secure, you probably have to rewrite it to make it secure.

Part B: Recognizing usage context for common phrases and sentence patterns

Fill in the blanks, each by using one of the following common phrases and sentence patterns (or their variations) which have been extracted from Units 0 to 6. Each blank space may contain any number of words as needed.

1. with the advent of (Unit 0)

2. <sentence>, such as X, Y and Z. (Unit 0, exercise 0.2)

3. <statement of fact>, but what <clause X> really <adjective or verb> <clause Y> (Unit 1)
4. X does something so <adverb> that <sentence> (Unit 1, exercise 1.3)
5. As a X, <instance of X> <rest of sentence>. (Unit 2, exercise 2.4)
6. X will do Y as <passive sentence about doing Y> (Unit 2, exercise 2.4)
7. to design X to do Y (Unit 3)
8. come with (Unit 5)
9. <description of X> known as <name of X, introduced for the first time> (Unit 5)
10. <clause>, for example, <rest of sentence> (Unit 6)
11. to represent X in/convert X into/... a form that can be [adverb] seen/understood/sent/... (Unit 6)

a. I have always enjoyed programming, but what really ignited my love of programming was developing my first real-world software which was actually used by a guy when doing his job. (pattern #3)

b. Bad programming results in difficult to read and hard to understand code, often known as spaghetti code. (pattern #9)

c. Equipped with such artificial intelligence features, the robot can, for example, detect when you leave the home. (pattern #10)

d. There are a few commonly used operating systems to choose from, such as Microsoft Windows, Apple Max OS X and Linux. (pattern #2)

e. Before programs can be run, they should be converted into a form that can be directly executed by hardware. (pattern #11)

f. Netbooks have been (are) designed to be used for simple, mundane tasks such as everyday word processing and web browsing. (pattern #7)

g. The logic circuit I designed and implemented worked as expected by the lab teacher. (pattern #6)

h. With the advent of modern touchscreen tablets, the way users interact with computers is fundamentally changing. (pattern #1)

i. Open source software comes with source code. (pattern #8)

j. The file search runs so quickly that you won't need to wait for it more than a few seconds. (pattern #4)

k. As a electrical engineer, I need to know how to use circuit design software. (pattern #5)