

21世纪高等学校计算机规划教材

21st Century University Planned Textbooks of Computer Science

# 计算机 英语

Computer English

司爱侠 张强华 编著

- 计算机英语畅销书作者的最新力作
- 精选最新英语时文，兼顾发展热点
- 教辅资料完整，教学支持服务周到



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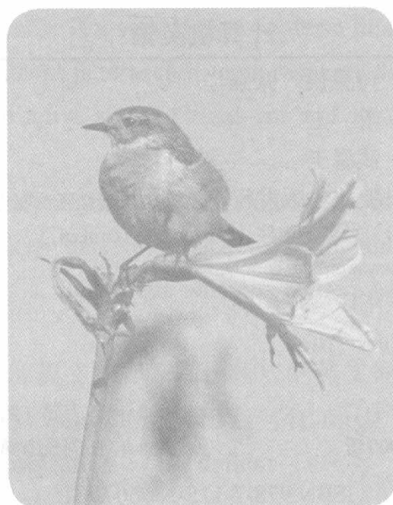
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## 内 容 提 要

本书是为培养计算机人才的专业英语能力而编写的教材。主要内容包括: 计算机硬件和软件基础、外部设备、操作系统、数据结构、C 语言、数据库、面向对象编程、计算机网络、因特网及相关技术、多媒体、人工智能、网络安全以及计算机病毒等。

全书以 Unit 为单位, 每个 Unit 由以下几部分组成: 课文——选材广泛、风格多样、切合实际; 单词——给出课文中出现的新词, 读者由此可以积累专业的基本词汇; 常用词组——给出本单元所涉及的常用词组; 难句讲解——讲解课文中出现的疑难句子, 培养读者的阅读理解能力; 习题——针对课文的练习, 巩固学习效果, 其中的真题再现, 作者遴选历年软件水平考试专业英语试题, 并提供参考答案, 这对参加这些考试的读者十分有用; 练习答案——供读者对照检查。

本书既可作为高等院校计算机相关专业、网络专业、电子商务专业、信息管理专业的教材, 也可供相应的培训班使用或作为相关技术人员的自学教材。

21 世纪高等学校计算机规划教材

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## 出版者的话

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计算机应用能力已经成为社会各行业最重要的工作要求之一，而计算机教材质量的好坏会直接影响人才素质的培养。目前，计算机教材出版市场百花争艳，品种急剧增多，要从林林总总的教材中挑选一本适合课程设置要求、满足教学实际需要的教材，难度越来越大。

人民邮电出版社作为一家以计算机、通信、电子信息类图书与教材出版为主的科技教育类出版社，在计算机教材领域已经出版了多套计算机系列教材。在各套系列教材中涌现出了一批被广大一线授课教师选用、深受广大师生好评的优秀教材。老师们希望我社能有更多的优秀教材集中地呈现在老师和读者面前，为此我社组织了这套“21世纪高等学校计算机规划教材-精品系列”。

“21世纪高等学校计算机规划教材-精品系列”具有下列特点。

(1) 前期调研充分，适合实际教学需要。本套教材主要面向普通本科院校的学生编写，在内容深度、系统结构、案例选择、编写方法等方面进行了深入细致的调研，目的是在教材编写之前充分了解实际教学的需要。

(2) 编写目标明确，读者对象针对性强。每一本教材在编写之前都明确了该教材的读者对象和适用范围，即明确面向的读者是计算机专业、非计算机理工类专业还是文科类专业的学生，尽量符合目前普通高等教学计算机课程的教学计划、教学大纲以及发展趋势。

(3) 精选作者，保证质量。本套教材的作者，既有来自院校的一线授课老师，也有来自IT企业、科研机构等单位的资深技术人员。通过他们的合作使老师丰富的实际教学经验与技术人员丰富的实践工程经验相融合，为广大师生编写出适合目前教学实际需求、满足学校新时期人才培养模式的高质量教材。

(4) 一纲多本，适应面宽。在本套教材中，我们根据目前教学的实际情况，做到“一纲多本”，即根据院校已学课程和后续课程的不同开设情况，为同一科目提供不同类型的教材。

(5) 突出能力培养，适应人才市场要求。本套教材贴近市场对于计算机人才的能力要求，注重理论技术与实际应用的结合，注重实际操作和实践动手能力的培养，为学生快速适应企业实际需求做好准备。

(6) 配套服务完善，共促提高。对于每一本教材，我们在教材出版的同时，都将提供完备的PPT课件，并根据需要提供书中的源程序代码、习题答案、教学大纲等内容，部分教材还将在作者的配合下，提供疑难解答、教学交流等服务。

在本套教材的策划组织过程中，我们获得了来自清华大学、北京大学、人民大学、浙江大学、吉林大学、武汉大学、哈尔滨工业大学、东南大学、四川大学、上海交通大学、西安交通大学、电子科技大学、西安电子科技大学、北京邮电大学、北京林业大学等院校老师的大力支持和帮助，同时获得了来自信息产业部电信研究院、联想、华为、中兴、同方、爱立信、摩托罗拉等企业和科研单位的领导和技术人员的积极配合。在此，人民邮电出版社向他们表示衷心的感谢。

我们相信，“21世纪高等学校计算机规划教材-精品系列”一定能够为我国高等院校计算机课程教学做出应有的贡献。同时，对于工作欠缺和不妥之处，欢迎老师和读者提出宝贵的意见和建议。

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# | Unit 1

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## Text A

### How Computers Work

A general-purpose computer has four main sections: the arithmetic and logic unit (ALU), the control unit, the memory, and the input and output devices, collectively termed I/O. These parts are interconnected by busses, often made of groups of wires.

The control unit, ALU, registers, and basic I/O, and often other hardware closely linked with these, are collectively known as a central processing unit (CPU). Early CPUs were comprised of many separate components but since the mid-1970s CPUs have typically been constructed on a single integrated circuit called a microprocessor.

#### 1. Control Unit

The control unit, often called a control system or central controller, directs the various components of a computer. It reads and interprets instructions in the program one by one. The control system decodes each instruction and turns it into a series of control signals that operate the other parts of the computer. Control systems in advanced computers may change the order of some instructions so as to improve performance.

A key component common to all CPUs is the program counter, a special memory cell that keeps track of which location in memory the next instruction is to be read from.

The control system's functions are as follows. Note that this is a simplified description and some of these steps may be performed concurrently or in a different order depending on the type of CPU:

- Read the code for the next instruction from the cell indicated by the program counter.
- Decode the numerical code for the instruction into a set of commands or signals for each of the other systems.
- Increment the program counter so it points to the next instruction.
- Read whatever data the instruction requires from cells in memory, or perhaps from an input device. The location of this required data is typically stored within the instruction code.
- Provide the necessary data to an ALU or register.
- If the instruction requires an ALU or specialized hardware to complete, instruct the hardware to



perform the requested operation.

- Write the result from the ALU back to a memory location or to a register or perhaps an output device.
- Jump back to the first step.

Since the program counter is conceptually just another set of memory cells, it can be changed by calculations done in the ALU. Adding 100 to the program counter would cause the next instruction to be read from a place 100 locations further down the program. Instructions that modify the program counter are often known as "jumps" and allow for loops and often conditional instruction execution.

It is noticeable that the sequence of operations that the control unit goes through to process an instruction is in itself like a short computer program. And indeed, in some more complex CPU designs, there is another yet smaller computer called a microsequencer that runs a microcode program that causes all of these events to happen.

## 2. Arithmetic and Logic Unit (ALU)

The ALU is capable of performing two classes of operations: arithmetic and logic.

The set of arithmetic operations that a particular ALU supports may be limited to adding and subtracting or might include multiplying or dividing, trigonometry functions and square roots. Some can only operate on integers whilst others use floating point to represent real numbers. However, any computer that is capable of performing just the simplest operations can be programmed to break down the more complex operations into simple steps that it can perform. Therefore, any computer can be programmed to perform any arithmetic operation, although it will take more time to do so if its ALU does not directly support the operation. An ALU may also compare numbers and return Boolean values depending on whether one is equal to, greater than or less than the other.

Logic operations involve Boolean logic: AND, OR, XOR and NOT. These can be useful both for creating complicated conditional statements and processing Boolean logic.

Superscalar computers contain multiple ALUs so that they can process several instructions at the same time. Graphics processors and computers with SIMD and MIMD features often provide ALUs that can perform arithmetic on vectors and matrices.

## 3. Memory

A computer's memory can be viewed as a list of cells into which numbers can be placed or read. Each cell has a numbered "address" and can store a single number. The computer can be instructed to "put the number 123 into the cell numbered 1357" or to "add the number that is in cell 1357 to the number that is in cell 2468 and put the answer into cell 1595". The information stored in memory may represent practically anything. Letters, numbers, even computer instructions can be placed into memory with equal ease. Since the CPU does not differentiate between different types of information, it is up to the software to give significance to what the memory sees as nothing but a series of numbers.

In almost all modern computers, each memory cell is set up to store binary numbers in groups of eight bits, called a byte. Each byte is able to represent 256 different numbers; either from 0 to 255 or

-128 to +127. To store larger numbers, several consecutive bytes may be used, typically, two, four or eight. When negative numbers are required, they are usually stored in two's complement notation. Other arrangements are possible, but are usually not seen outside of specialized applications or historical contexts. A computer can store any kind of information in memory as long as it can be somehow represented in numerical form. Modern computers have billions or even trillions of bytes of memory.

The CPU contains a special set of memory cells called registers that can be read and written to much more rapidly than the main memory area. There are typically between two and one hundred registers depending on the type of CPU. Registers are used for the most frequently needed data items to avoid having to access main memory every time data is needed. Since data is constantly being worked on, reducing the need to access main memory, which is often slow compared to the ALU and control units, greatly increases the computer's speed.

Computer main memory comes in two principal varieties: random access memory or RAM and read-only memory or ROM. RAM can be read and written to anytime the CPU commands it, but ROM is pre-loaded with data and software that never changes, so the CPU can only read from it. ROM is typically used to store the computer's initial start-up instructions. In general, the contents of RAM are erased when the power to the computer is turned off while ROM retains its data indefinitely. In a PC, the ROM contains a specialized program called the BIOS that orchestrates loading the computer's operating system from the hard disk drive into RAM whenever the computer is turned on or reset. In embedded computers, which frequently do not have disk drives, all of the software required to perform the task may be stored in ROM. Software that is stored in ROM is often called firmware because it is notionally more like hardware than software. Flash memory blurs the distinction between ROM and RAM by retaining data when turned off but being rewritable like RAM. However, flash memory is typically much slower than conventional ROM and RAM so its use is restricted to applications where high speeds are not required.

In more sophisticated computers there may be one or more RAM cache memories which are slower than registers but faster than main memory. Generally computers with this sort of cache are designed to move frequently needed data into the cache automatically, often without the need for any intervention on the programmer's part.

#### **4. Input/Output (I/O)**

I/O is the means by which a computer receives information from the outside world and sends results back. Devices that provide input or output to the computer are called peripherals. On a typical personal computer, peripherals include inputs like the keyboard and mouse, and outputs such as the display and printer. Hard disks, floppy disks and optical discs serve as both inputs and outputs. Computer networking is another form of I/O.

Often, I/O devices are complex computers in their own right with their own CPU and memory. A graphics processing unit might contain fifty or more tiny computers that perform the calculations necessary to display 3D graphics. Modern desktop computers contain many smaller computers that assist the main CPU in performing I/O.

## New Words

purpose	[ˈpəːpəs]	<i>n.</i> 目的, 意图, 用途
arithmetic	[əˈriθmətik]	<i>n.</i> 算术, 算法
memory	[ˈmeməri]	<i>n.</i> 存储器, 内存
input	[ˈɪnput]	<i>n.</i> & <i>v.</i> 输入
output	[ˈaʊtput]	<i>n.</i> 输出
device	[diˈvaɪs]	<i>n.</i> 设备, 装置
interconnect	[ˌɪntəːkəˈnekt]	<i>vt.</i> 使互相连接
bus	[bʌs]	<i>n.</i> 总线
wire	[ˈwaɪə]	<i>n.</i> 金属丝, 电线
hardware	[ˈhɑːdweə]	<i>n.</i> 硬件
comprise	[kəmˈpraɪz]	<i>v.</i> 包含, 由……组成
separate	[ˈsepəreɪt]	<i>adj.</i> 分开的, 分离的, 个别的, 单独的
component	[kəmˈpəʊnənt]	<i>n.</i> 部件; 成分, 部分
construct	[kənˈstrʌkt]	<i>vt.</i> 建造, 构造, 创立
microprocessor	[ˌmaɪkrəʊˈprəʊsesə]	<i>n.</i> 微处理器
direct	[diˈrekt]	<i>v.</i> 指导, 指挥
concurrently	[kənˈkʌrəntli]	<i>adv.</i> 并列地, 并行地; 同时发生地
instruction	[ɪnˈstrʌkʃən]	<i>n.</i> 指令
program	[ˈprəʊgræm]	<i>n.</i> 程序
decode	[diːˈkəʊd]	<i>vt.</i> 解码, 译码
signal	[ˈsɪgnl]	<i>n.</i> 信号 <i>adj.</i> 信号的 <i>v.</i> 发信号
operate	[ˈɒpəreɪt]	<i>v.</i> 操作, 运转
location	[ləʊˈkeɪʃən]	<i>n.</i> 地点, 位置
function	[ˈfʌŋkʃən]	<i>n.</i> 功能, 作用; 函数
perform	[pəˈfɔːm]	<i>vt.</i> 履行, 执行
type	[taɪp]	<i>n.</i> 类型, 字型 <i>v.</i> 打字
cell	[sel]	<i>n.</i> 单元, 电池
increment	[ˈɪnkrimənt]	<i>n.</i> 增加, 增量
point	[pɔɪnt]	<i>vi.</i> 指, 指向, 表明
register	[ˈredʒɪstə]	<i>n.</i> 寄存器 <i>v.</i> 记录, 登记, 注册
counter	[ˈkaʊntə]	<i>n.</i> 计数器
modify	[ˈmɒdɪfaɪ]	<i>vt.</i> 更改, 修改
jump	[dʒʌmp]	<i>n.</i> 跳转

loop	[lu:p]	<i>n.</i> 循环
conditional	[kən'diʃnəl]	<i>adj.</i> 有条件的
execution	[.eksɪ'kju:ʃən]	<i>n.</i> 实行, 完成, 执行
sequence	[.si:kwəns]	<i>n.</i> 次序, 顺序, 序列
microsequencer	[.maɪkrəu'si:kwəns]	<i>n.</i> 微序列器
microcode	[.maɪkrəkəud]	<i>n.</i> 微码
logic	[.lɒdʒɪk]	<i>n.</i> 逻辑, 逻辑学, 逻辑性
subtract	[səb'trækt]	<i>vt.</i> 减去
integer	[.ɪntɪdʒə]	<i>n.</i> 整数
Boolean	[.bu:liən]	<i>adj.</i> 布尔的
statement	[.steɪtmənt]	<i>n.</i> 语句
multiple	[.mʌltɪpl]	<i>adj.</i> 多样的, 多重的 <i>n.</i> 倍数, 若干 <i>v.</i> 成倍增加
processor	[.prəusesə]	<i>n.</i> 处理器, 处理机
vector	[.vektə]	<i>n.</i> 向量, 矢量
matrix	[.meɪtrɪks]	<i>n.</i> 矩阵
address	[ə'dres]	<i>n.</i> 地址
differentiate	[dɪfə'renʃieɪt]	<i>v.</i> 区分, 区别, 分辨
significance	[sɪg'nɪfɪkəns]	<i>n.</i> 意义, 重要性
binary	[.baɪnəri]	<i>adj.</i> 二进制的
byte	[baɪt]	<i>n.</i> 字节
consecutive	[kən'sekjʊtɪv]	<i>adj.</i> 连续的, 连贯的, 顺序的
negative	[.neɡətɪv]	<i>n.</i> 否定, 负数
complement	[.kɒmplɪmənt]	<i>n.</i> 补码
arrangement	[ə'reɪndʒmənt]	<i>n.</i> 排列, 安排
rapidly	[.ræpɪdli]	<i>adv.</i> 快速地, 迅速地
constantly	[.kɒnstəntli]	<i>adv.</i> 经常地, 不断地
variety	[və'reɪətɪ]	<i>n.</i> 变化, 变量; 种类
random	[.rændəm]	<i>adj.</i> 随机的 <i>n.</i> 随意, 任意
initial	[.ɪnɪʃəl]	<i>adj.</i> 最初的, 初始的
erase	[ɪ'reɪz]	<i>vt.</i> 删除, 抹去, 擦掉
retain	[ri'teɪn]	<i>vt.</i> 保持, 保留
orchestrate	[.ɔ:kɪstreɪt]	<i>vt.</i> 使和谐地结合起来; 配合
reset	[ri:'set]	<i>vt.</i> 复位, 重新启动
embed	[ɪm'bed]	<i>vt.</i> 嵌入
firmware	[.fɜ:m.wɛə]	<i>n.</i> 固件, 韧件(软件硬件相结合)
blur	[blɜ:]	<i>v.</i> 模糊
conventional	[kən'venʃənəl]	<i>adj.</i> 惯例的, 常规的

restricted	[ris'triktid]	<i>adj.</i> 受限制的, 有限的
cache	[kæʃ]	<i>n.</i> 高速缓存
automatically	[ɔ:tə'mætikli]	<i>adv.</i> 自动地
intervention	[intə'venʃən]	<i>n.</i> 干涉, 介入
receive	[ri'si:v]	<i>vt.</i> 收到, 接到, 接收
peripheral	[pə'rifərəl]	<i>n.</i> 外围设备 <i>adj.</i> 外围的
keyboard	['ki:bɔ:d]	<i>n.</i> 键盘
mouse	['maʊs]	<i>n.</i> 鼠标
display	[di'splei]	<i>n.</i> 显示, 显示器
printer	['printə]	<i>n.</i> 打印机
interface	['intəfeis]	<i>n.</i> 界面, 接口
tiny	['taini]	<i>adj.</i> 很少的, 微小的
calculation	[,kælkju'leɪʃən]	<i>n.</i> 计算

## Phrases

integrated circuit	集成电路
central controller	中央控制器
keep track of	跟踪, 明了
depend on	依靠, 依赖
a set of	一组, 一套
trigonometry function	三角函数
square root	平方根
floating point	浮点数
real number	实数
break down	分解
equal to	等于
greater than	大于
less than	小于
logic operation	逻辑运算
superscalar computer	超级计算机
set up	设置
as long as	只要, 在……的时候
turn off	关机
hard disk drive	硬盘驱动器
turn on	开机
flash memory	闪存
personal computer	个人计算机, 缩写为 PC
floppy disk	软盘

optical disc  
desktop computer

光盘  
台式计算机

## Abbreviations

ALU	算术逻辑单元; 运算器 (Arithmetic and Logic Unit)
CPU	中央处理器 (Central Processing Unit)
SIMD	单指令多数据 (Single Instruction Multiple Data)
MIMD	多指令多数据 (Multiple Instruction Multiple Data)
RAM	随机存储器 (Random Access Memory)
ROM	只读存储器 (Read-Only Memory)
BIOS	基本输入输出系统 (Basic Input Output System)

## Notes

[1] A key component common to all CPUs is the program counter, a special memory cell that keeps track of which location in memory the next instruction is to be read from.

本句中, a special memory cell that keeps track of which location in memory the next instruction is to be read from 是一个名词性短语, 对 the program counter 进行补充说明。在该短语中, that keeps track of which location in memory the next instruction is to be read from 是一个定语从句, 修饰和限定 a special memory cell。keep track of 的意思是“跟踪; 明了”。

[2] It is noticeable that the sequence of operations that the control unit goes through to process an instruction is in itself like a short computer program.

本句中, It 是形式主语, 真正的主语是 that 引导的从句 the sequence of operations that the control unit goes through to process an instruction is in itself like a short computer program。在该从句中, the sequence of operations 是主语, is like a short computer program 是谓语, that the control unit goes through to process an instruction 是一个定语从句, 修饰和限定 the sequence of operations, 动词不定式短语 to process an instruction 作目的状语, 修饰 goes through。in itself 的意思是“本身, 实质上”。

[3] And indeed, in some more complex CPU designs, there is another yet smaller computer called a microsequencer that runs a microcode program that causes all of these events to happen.

本句中, called a microsequencer 是一个过去分词短语, 作定语, 修饰和限定 another yet smaller computer。that runs a microcode program 是一个定语从句, 修饰和限定 a microsequencer, that causes all of these events to happen 也是一个定语从句, 修饰和限定 a microcode program。

[4] Therefore, any computer can be programmed to perform any arithmetic operation, although it will take more time to do so if its ALU does not directly support the operation.

本句中, although it will take more time to do so if its ALU does not directly support the operation 是一个让步状语从句。在该从句中, if its ALU does not directly support the operation 是一个条件状语从句。so 指 performing any arithmetic operation。

[5] Since the CPU does not differentiate between different types of information, it is up to the software to give significance to what the memory sees as nothing but a series of numbers.

本句中，句型 *It is up to sb. to do sth.* 的意思是“由某人来做某事”。请看下例：

*It is not up to you to decide what you should do next.*

下一步该做什么我们说了不算。

*significance* 的意思是“意义”、“重要性”；*nothing but* 等于 *nothing else than*，意思是“只，不过”。请看下例：

*What he said is of no significance, nothing but nonsense.*

他说的话毫无意义，简直就是一派胡言。

[6] *Since data is constantly being worked on, reducing the need to access main memory, which is often slow compared to the ALU and control units, greatly increases the computer's speed.*

本句中，*Since data is constantly being worked on* 是一个原因状语从句，*reducing the need to access main memory* 是动名词短语作主语，*which is often slow compared to the ALU and control units* 是一个非限定性定语从句，对 *main memory* 进行补充说明，*which* 指 *main memory*。

## Exercises

【 Ex. 1 】 根据课文内容回答问题

- (1) How many main sections does a general-purpose computer have? What are they? And how are they interconnected?
- (2) What is the control unit often called? Please list.
- (3) Please list the functions of the control system.
- (4) What are the two classes of operations ALU is capable of performing?
- (5) What do logic operations involve?
- (6) What can a computer's memory be viewed as? What does each of them have?
- (7) What are the two principal varieties of computer main memory?
- (8) In a PC, what does the specialized program called BIOS do?
- (9) Why is the software that is stored in ROM often called firmware?
- (10) What is I/O?

【 Ex. 2 】 根据下面的英文解释，写出相应的英文词汇

- (1) \_\_\_\_\_: Information put into a communications system for transmission or into a computer system for processing.
- (2) \_\_\_\_\_: An integrated circuit that contains the entire central processing unit of a computer on a single chip.
- (3) \_\_\_\_\_: An instruction sequence in programmed instruction.
- (4) \_\_\_\_\_: A parallel circuit that connects the major components of a computer, allowing the transfer of electric impulses from one connected component to any other.
- (5) \_\_\_\_\_: A computer and the associated physical equipment directly involved in the performance of data-processing or communications functions.
- (6) \_\_\_\_\_: A unit of a computer that preserves data for retrieval.
- (7) \_\_\_\_\_: The information produced by a computer from a specific input.

- (8) \_\_\_\_\_: A basic unit of storage in a computer memory that can hold one unit of information, such as a character or word.
- (9) \_\_\_\_\_: A part of the central processing unit where groups of binary digits are stored as the computer is processing them.
- (10) \_\_\_\_\_: A number used in information storage or retrieval that is assigned to a specific memory location.

【 Ex. 3 】把下列句子翻译为中文

- (1) He went to town with the purpose of buying a new computer.
- (2) Most online services have their own browsers.
- (3) Floppy disk may be double-density or high-density.
- (4) The formula then includes the addresses of the cells.
- (5) C might best be described as a "medium level language".
- (6) Every browser has the built-in ability to understand HTML.
- (7) C is one of the most popular computer languages in the world.
- (8) Java technology is both a programming language and a platform.
- (9) In fact, a window manager can be thought of as a GUI for a CLI OS.
- (10) A database management system handles user requests for database action.

【 Ex. 4 】选择适当的答案填空（真题再现 2007年11月程序员专业英语试题）

- (1) A \_\_\_ is a functional unit that interprets and carries out instructions.  
A. memory                      B. processor                      C. storage                      D. network
- (2) A \_\_\_ consists of the symbols, characters, and usage rules that permit people to communicate with computer.  
A. programming language                      B. network  
C. keyboard                      D. display
- (3) \_\_\_ software, also called end-user program, includes database programs, word processors, spreadsheets etc.  
A. Application                      B. System                      C. Compiler                      D. Utility
- (4) In \_\_\_, the only element that can be deleted or removed is the one that was inserted most recently.  
A. a line                      B. a queue                      C. an array                      D. a stack
- (5) Most \_\_\_ measures involve data encryption and password.  
A. security                      B. hardware                      C. display                      D. program

【 Ex. 5 】将下列词填入适当的位置（每词只用一次）

speed	device	other	considered	exists
hardware	effective	operate	moving	designer

A buffer is a data area shared by \_\_\_(1)\_\_\_ devices or program processes that \_\_\_(2)\_\_\_ at different speeds or with different sets of priorities. The buffer allows each \_\_\_(3)\_\_\_ or process to operate without being held up by the \_\_\_(4)\_\_\_. In order for a buffer to be \_\_\_(5)\_\_\_, the size of the buffer and the algorithms for \_\_\_(6)\_\_\_ data into and out of the buffer need to be \_\_\_(7)\_\_\_ by the



buffer \_\_\_(8)\_\_. Like a cache, a buffer is a "midpoint holding place" but \_\_\_(9)\_\_\_ not so much to accelerate the \_\_\_(10)\_\_\_ of an activity as to support the coordination of separate activities.

## Text B

### PC Hardware Basic

#### 1. Computer case (PC enclosure)

Computer systems are general-purpose devices that may be modified to perform particular tasks or functions. Such general-purpose computers typically include housings for enclosing various components and circuitry associated with operating the general-purpose computers. The computer enclosure is used to protect the components and circuitry housed therein from physical damage, and to prevent electromagnetic signals generated by components of the computer from escaping and causing electromagnetic interference (EMI) to other electronic devices in the vicinity of the computer. A typical computer enclosure includes a chassis, an expansion card seat, a front bezel and a plurality of components connectable to external apparatus and systems. In a typical application, a computer case has a high structural integrity to protect against physical impact, and conductive, shielding materials to reduce EMI emissions. The conductive components of the computer are also grounded to the case to protect users and computer components from electric shock. In assembly, the bezel, the side panels and the cover are directly secured to the base with screws. In order to remove the bezel or the cover, the screws must be disengaged from the base one by one. Some computer enclosures adopt hooks to reduce or even eliminate the need for screws. Hooks formed on panels of the enclosure engage in recesses defined in other panels of the enclosure. Modern computer systems comprise not only a motherboard, but also one or more expansion cards that provide specialized functions. A rear panel of a computer case typically defines a plurality of expansion slots therein. Each expansion card typically comprises a slot cover attached at one of the expansion slots, to correctly position the corresponding expansion card. In most cases, the computer housings take the form of a box, as for example, the housings associated with tower style computers.

#### 2. PC motherboard

A general computer system is basically built with a motherboard, interface cards and peripherals. The motherboard is the physical arrangement that contains the system's basic circuitry and components. The motherboard functions to facilitate communication between each of the internal components of the system, which usually contains a controller chip set, several slots for installing the interface cards, a central processing unit (CPU) and several memory module slots for accommodating the memory modules. Typically, a computer motherboard includes many input/output (I/O) ports for connecting to various peripherals, and these I/O ports are arranged on the personal computer. A computer motherboard comprises a large printed circuit board having a number of components mounted thereon, including a processor coupled to a host or local bus, a chip set, system memory coupled to a memory bus, and a Peripheral Component Interconnect (PCI) bus. The motherboard is typically permanently attached to the