The Development of Computer Technology

Unit 1

I ▶ Guided Reading

Pre-reading Activities

1. *Try to fill the missing words. The first letter of each word is given to help you.*

The first electronic c _____ were built in the 1940s. By the early 1970s, they were in common use in large b _____, g _____ and the m _____. The largest computers were called m _____.

2. *Name the following figures.*

Figure 1：_____   Figure 2：_____   Figure 3：_____

New Words

apprentice　*n.* 学徒,徒弟

arithmetical　*a.* 算术的

manual　*a.* 手工的,用手操作的;靠人工的

abacus　*n.* 算盘

consume　*v.* 消耗;消费

calculation　*n.* 计算;推断;预测;估计

colossus　*n.* 巨大的人(物),伟人;极重要的事物

multiplication　*n.* 乘法,乘法运算;增加,增多

figure　*n.* 数字,数字符号(即0~9),位数;画像,模型;图形,图表

numerical　*a.* 数字的,数值的;用数字表示的

integrator　*n.* 积分器

calculator　*n.* 计算器

vacuum　*n.* 真空

relay　*n.* 继电器;中继站;转播

register　*n.* 寄存器;记录册

crystal　*n.* 水晶,水晶玻璃

diode　*n.* 二极管

capacitor　*n.* 电容器

house　*v.* 给……提供住房;收藏,存放

drawback　*n.* 缺点,毛病;不利因素

stride　*n.* 进步,大步,阔步;*v.* 迈大步走

component　n. 构件，元件
semiconductor　n. 半导体
chip　n. 芯片
transistor　n. 晶体管，晶体管收音机
miniaturize　v. 使微型化，使小型化
circuit　n. 电路，线路
mainframe　n. 主机
microprocessor　n. 微处理器，微处理机
hurdle　n. 困难，障碍
simplify　v. 简化
version　n. 版本，改编本；描述；复制件
drop-out　n. 辍学者
graphics　n.（尤指计算机程序中的）图，图表
interface　n. 接口，界面
application　n. 申请（书）；用途；实际应用
spreadsheet　n. 电子表格
novice　n. 初学者，新手
fledgling　a. 刚刚起步的；新形成的；n. 学飞的小鸟
unprecedented　a. 前所未有的

unbroken　a. 未破损的；未中断的，持续的
string　n. 线；一连串，一系列
underscore　v. 强调；n. 下划线（字符）
expansion　n. 扩大，增加；（公司或企业）扩张，扩充
automate　v. 自动化
share　n. 份额；一份；v. 共有，共用；均摊
dub　v.（一般用被动态）把……诙谐地称为；给……起绰号
prestige　n. 声望
fad　n. 时尚，风尚；流行一时的狂热
retrieve　v. 检索
legitimate　a. 合法的
emerge　v. 出现，显露；兴起
intriguing　a. 令人感兴趣的；出人意料的
fascinating　a. 有极大吸引力的；迷人的；引人入胜的
quantum　n. 量子
Maglev　n.【缩写词】磁悬浮列车
prototype　n.（新机器，新装置等的）原型

Useful Phrases

make great/rapid strides	取得很大进展/进步
in the form of	以……形式
at the rate of	以……速度/比率
in no time	很快
be accustomed to	习惯于
a matter of	大约
all levels of	各行各业的
CD-based software	光盘软件
cope with	处理，应付

Reading Passage

The Development of Computer Technology

　　Whatever you are, a scientist or an apprentice, a farmer or a successful scholar; and whether you are diligent or lazy, old or young, in the modern work, study and life, you always need your honest friends—computers.

　　In the life of humanity, arithmetical operations have been more important. So, man gradually invented such manual computing devices as sand tables, abacus and napier bones

for performing different calculations. But those devices consumed a large amount of time and were unable to handle large numbers in calculations.

With the invention of the computer, mankind made a big step forward.

In 1943, a British mathematician, Alan Mathison Turing developed the first pure electronic digital programmable computer that was known as Colossus. It could perform only some specific functions. In 1944, Howard Aiken, a professor of Harvard University, designed MARK Ⅰ, and built by IBM, which could perform the multiplication of two numbers of twenty figures in 6 seconds. In the year 1946, at the Moore School of Engineering of the University of Pennsyvania, Dr. John Mauchly created and their team developed ENIAC (the Electronic Numerical Integrator and Calculator). ENIAC is considered to have been the first truly electronic computer in the world. It remained in operation until 1955. This machine included 17,468 vacuum tubes, 1,500 relays, 70,000 registers, 7,200 crystal diodes and 10,000 capacitors. They were housed in a large room, and required special electrical cabling and air conditioning. Although it could operate at 1,000 times more speed than that of MARK Ⅰ, it was too noisy and large in size.

Because of the drawbacks of the early machines, engineers and technicians never stopped going to develop new products.

In the late 1960s, engineers made great strides in reducing the size of electronic components. They developed the semiconductor chip, which was about the size of a fingernail and could contain hundreds of transistors. The semiconductor chips enabled engineers to miniaturize the circuits contained in all electronic devices. Most importantly, it produced a new generation of mainframes and minicomputers with increased capabilities, greater speed, and smaller size.

In the early 1970s, semiconductor technology progressed to the point where the circuits for the "brain" of a computer (the Central Processing Unit or CPU) could be manufactured on a single semiconductor chip. These miniaturized computers were called microprocessors, and were manufactured by corporations such as Intel and Motorola.

In order for microcomputers to become problem-solving tools, a number of hurdles needed to be overcome. The first was to simplify the program for the machines. One step in this direction was taken by a young Harvard drop-out named Bill Gates, who wrote a version of the programming language BASIC for one of the earliest microcomputers. BASIC had been introduced at Dartmouth College in the mid-1960s by John Kemeny and Kenneth Kurtz. Thus it was a popular programming language on mainframe computers. In 1975, Gates founded a computer company called Microsoft, which has become one of the major producers of software for microcomputers. Once, in his speech to Tsinghua University, Gates said "We spent a lot of our time writing software. I believe software is the key element that really unlocks the power of all this technology and the idea of making it easy to find information, easy to create information, easy to communicate with other people." Over the next few years, Microsoft did a lot of research and developed Windows NT, the

graphics interface, the application, CD-based software, and building the Internet into the software…So many application packages began to appear around 1980. The first generation programs for word processing, data management, spreadsheets, and communication allowed novice users to experience the power of microcomputing.

In 1977, Stephen Jobs and Stephen Wozniak, two microcomputer enthusiasts, working in a garage, designed their own microcomputer. This was named the Apple. And their fledgling business was to become the Apple Computer Corporation. Business grew at an unprecedented rate. In no time, Apple was selling hundreds and then thousands of machines per month. A nearly unbroken string of successful products like iPod, iPhone, and iPad, produced by Apple, changed the PC, electronics and digital-media industries.

One reason behind Apple's success was the availability of a number of useful application programs. The most important of these was spreadsheet VISICALS, which allowed accountants and financial planners to automate many of the calculations that they were accustomed to doing on adding machines, or with pencil and paper.

At about the same time, as the introduction of the Apple Ⅱ, a number of the microcomputer appeared on the market. One of the most popular was Tandy Corporation's TRS-80. Apple and Tandy were the two largest manufacturers, each with about a 25 percent share of the market. Since then, companies worldwide have come to recognize the computer technology's commercial potential and have entered the market.

In 1981, International Business Machines (IBM), the largest computer company in the world, introduced its own microcomputer, dubbed the "IBM PC".

Today, the development of computer technology is bringing about new changes with each passing day, such as Big Data, Computing Cloud, Facebook, Internet of things, Mobile Internet, Artificial Intelligence…The new computer products are emerging in an endless stream, such as note-book computer, iMac, iBook, iTune, mobile phone, quantum computer…

Now, let's see the development and the application of the computer technology in China.

In early 2019, Huawei 5G became a powerful technological platform and officially opened the prologue of commercial services, and brought about encouraging social effects.

Based on 5G, a farmer from Henan Province, using one UAV managed 400 (mu) farmland and increased agricultural productivity and quality.

Based on 5G, one of the China Huawei Desert Tree Robots can work for 24 hours a day continuously.

Based on 5G, "AI TCM"—the integration of AI and the TCM, will become the "Number One" in the world.

On July 31st, 2020, BD3, called "Mazu on the Sea" officially opened, benefiting the humankind.

On January 31st, 2021, at a speed of 627 km/h, a high-temperature superconducting

maglev（train）sped by，from SWJTU.

On May 6th 2021，five months after，"Jiu Zhang" the first quantum computer's coming，China's 62-qubit superconducting processor（a quantum computer prototype）"Zu Chongzhi" was developed successfully，which implemented a programmable two-dimensional walk. To process the same task，it takes only 200 seconds for a "Jiu Zhang" quantum，but 10,000 years for a traditional computer！

You，definitely know：this is the Chinese Velocity and Efficiency！China is filled with wonder！

Now，people use computers to process，store，retrieve，and analyze information；search for everything on-line，order pizza on-line，make friends on-line…People even use computers to run their homes：controlling the heating，air conditioning and cooking systems，and coping with the housework.

With a computer，is there anything that we cannot do？

What will the future of computer technology be？

"Beyond calculation." The future is always intriguing and fascinating，I think.

参考译文

Notes to the Passage

1）Napier bones,纳皮尔算筹。1617 年英国数学家约翰·纳皮尔（John Napier）发明的Napier 乘除器。

2）I believe software is the key element that really unlocks the power of all this technology and the idea of making it easy to find information，easy to create information，easy to communicate with other people.

I believe 分别是主句的主语和谓语。software is…又分别是宾语从句中的主、谓语；从句中的表语 the key element 后,由 that 引导定语从句修饰 element。关系代词 that 是定语从句的主语,谓语 unlocks 有两个宾语 the power, the idea。介词短语 of making it easy to…是 idea 的后置定语;it 充当动名词 making 的形式宾语,分别代替后面的不定式短语 to find information, to create information, to communicate with other people。

3）A nearly unbroken string of successful products like iPod，iPhone，and iPad，produced by Apple，changed the PC，electronics and digital-media industries.

这是一个简单句。主语是 products,谓语是 changed。

4）The most important of these was spreadsheet VISICALS，which allowed accountants and financial planners to automate many of the calculations that they were accustomed to doing on adding machines，or with pencil and paper.

which 引导非限制性定语从句，修饰 VISICALS。在这个非限制性定语从句中,还有一个由 that 引导的限制性定语从句,修饰 many of the calculations。

5）The fact that IBM，a company of such corporate prestige，would enter this market convinced businesses that the microcomputer was more than a passing fad.

主句的主语是 the fact，主句的谓语是 convinced，其后带有复合宾语 businesses that the microcomputer was…同位语从句中的主语是 IBM，谓语是 would enter…；a company of such corporate prestige 充当 IBM 的同位语。

6）Beyond Calculation，书名。1997 年，ACM（Association for Computing Machinery，美国计算机协会）成立 50 周年庆典，邀请几位计算机学科方面的专家撰写文章，预测 50 年后计算机技术发展前景，这些文章结集成册，名为 Beyond Calculation。

Check Your Comprehension

1. Answer the following questions.

1）What were the largest computers like ENIAC called?

2）What did engineers develop in the late 1960s and early 1970s?

3）What was the significance of the appearance of the semiconductor chip?

4）What strides did the engineers make in semiconductor technology in the early 1970s?

5）Who wrote a version of the programming language BASIC?

6）Who designed and developed the Apple?

7）Why was Apple so successful?

8）When did many applications packages begin to appear?

9）What were the first generation programs?

10）When did IBM introduce its own microcomputer IBM PC?

2. Complete the following note-taking with the information mentioned in the passage.

1）The semiconductor chip developed in the late 1960s and early 1970s was about the size of a _____ and could contain hundreds of _____. The semiconductor chips enabled engineers to miniaturize the _____ contained in all electronic devices. Most importantly, it produced a new generation of _____ and minicomputers with _____ capability, _____ speed, and _____ size.

2）In the early 1970s, semiconductor technology progressed so that the Central Processing Unit could be manufactured on a single _____. These miniaturized computers were called _____, and were manufactured by corporations as _____ and _____.

3）Many applications packages began to appear around 1980. Among these are programs for _____, _____, spreadsheets and _____.

3. Fill in each blank with a suitable term according to its official definition. Then, translate them into Chinese.

1）_____, to convert a process or equipment to automatic operations.

2）_____, a large computer, in particular one to which other computers can be connected so that they can share facilities the main frame provides.

3）_____, in data communications, a means of two-way communication between two data terminal installations.

4）_____, a software package widely used by managers and accountants. It is a visually oriented program that aids in executing and understanding financial calculations. A

spreadsheet consists of cells which are organized by row and column.

5）_____, a common program written for a major application so that a user's specific problems of data or organization will not make the package less useful.

6）_____, the process of transferring information in the various media from one point，person，or device to another.

7）_____, to locate data in storage and read it so that it can be processed，printed，or displayed.

8）_____, a high-level programming language with a small repertoire of commands and a simple syntax widely used in microcomputers.

9）_____, in computer programming，a popular spreadsheet package.

4. *Recognize the following abbreviations by matching them with their corresponding full names*.

1）BASIC
2）ENIAC
3）CPU
4）PC
5）IBM
6）UAV
7）TCM
8）BD3
9）Maglev
10）SWJTU

a．the Electronic Numerical Integrator and Calculator
b．Beginner's All-purpose Symbolic Instruction Code
c．Personal Computer
d．the Central Processing Unit
e．International Business Machines
f．Southwest JiaoTong University
g．Beidou-3 Global Navigation System
h．Magnetically Levitated Vehicle
i．Unmanned Aerial Vehicle
j．Traditional Chinese Medicine

5. *Match each of the following terms to its equivalent*(s).

1）an apprentice
2）arithmetical operations
3）register
4）mainframe
5）programmable computer

a．calculator with programmability
b．host processor
c．memory unit
d．mathematical calculations
e．a novice

6. *Oral Activity*. *Practise the following dialogue with your partner*.

A：Professor Li，we know you're an expert on computer technology. Could you please tell our TV audience some information about the history of computers?

B：Okay. In 1930，the first analogue computer(模拟机) was built by an American named Vannevar Bush.

A：What about the second generation?

B：In 1960 the second generation of computers was developed. Compared to the first generation，they could perform work 10 times faster.

A：What was the reason?

B：Because transistors were used instead of vacuum tubes. And they were smaller，faster and more dependable.

A：Thanks for your information. Would you please further explain the third and fourth

generations?

B：Yeah. The third generation appeared on the market in 1965. Their calculation speed was 1 000 times as the first generation.

A：What's the difference between the second and the third generations?

B：The third generation was controlled by tiny integrated circuits，so they were smaller and more dependable.

A：Now，let's come to the fourth.

B：Because of the development of microminiaturization technology，the fourth generation of computers is 50 times faster than the third generation and can complete approximately 1,000,000 instructions per second.

A：As we know，the fifth generation of computers，that is，portable computers，has entered into our life such as business area.

B：Yes. The fifth-generation computer has replaced every computer we know.

A：Let's end our program today. Thank you，Professor Li.

Ⅱ Language Work

Vocabulary

Exercise 1 *Form new words by adding one of the suffixes：-ance，-ence，-er，-or，-ment，-age. Then give their Chinese meanings.*

disturb	_____	_____
persevere	_____	_____
depend	_____	_____
confide	_____	_____
bid	_____	_____
scan	_____	_____
initiate	_____	_____
edit	_____	_____
equip	_____	_____
acknowledge	_____	_____
broker	_____	_____
drain	_____	_____

Exercise 2 *Fill in the blanks with the words or phrases given below. Change the form where necessary.*

> manufacture　　a matter of　　available　　accustomed　　make great strides
> recognize　　band　　underscore　　participate in　　progress　　at the rate of

1) She has been working on the design of the drawing for _____ six hours.

2) Intel and Motorola _____ microprocessors.

3) I'm not _____ to associating with society people.

4) There were no tickets _____ for Friday's performance.

5) China has _____ in computer technology.

6) The word "_____" is an underlined character often used _____ a letter or a word；on nongraphics displays，generally used to indicate italic characters.

7) John is _____ as the best footballer in the school.

8) The output of computers manufactured in China increases _____ 20 percent yearly.

9) The construction of the new building is _____ according to schedule.

10) There is a rule that professionals cannot _____ the tournament.

Structure

句子的成分

句子的成分包括主语（the Subject）、谓语（the Predicate）、宾语（the Object）、表语（the Predicative）、定语（the Attribute）、状语（the Adverbial）和同位语（the Appositive）等。

主语是句子中行为、动作、状态的主体，是施动者；被动句中的主语是受动者。名词、代词或起名词作用的词组、短语或句子可以充当句子的主语。谓语用于说明主语的动作，处于某种状态，或具有某种特征，由动词来充当谓语。主语和谓语是句子的主要成分。谓语在人称上必须和主语保持一致。宾语表示动作的承受者或动作产生的结果，分为直接宾语、间接宾语、复合宾语、同源宾语和保留宾语等。表语是说明主语的身份、特征或状态的，也称为主语补足语。定语修饰或限制名词、短语或句子，说明事物的属性、性质、特征或状态等。定语有前置定语和后置定语两种。状语是修饰动词、形容词或全句的句子成分。同位语是对句子某一成分（主语或宾语）作进一步解释说明，而与被其说明的部分在语法上处于同等地位的词、短语或句子。

此外，还有与整个句子没有语法联系的独立成分。如对句子起补充说明作用的插入成分（Parenthesis），表示说话人情感的感叹词（Interjections），以及对他人的呼语（Direct Address）等。

Exercise Analyze the following sentences，and point out the function of the underlined parts in each sentence.

1) Laser is one of the most sensational developments in recent years.

2) The computers have already changed our lives since 1946.

3) Computers are wonderful machines.

4) The Backspace is near the top right side of keyboard.

5) Scientists have sent rockets into outer space.

6) Before quitting the program，you must save your work.

7) The computer must have an operating system—its main control program—or it just won't start.

8) In any event of freeze-ups，by pressing the Reset button，you are telling the computer to give up and start over.
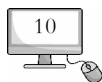
9）Oh，what a fine computer！

10）Normally，when you see the term BIOS by itself，it refers to the PC's main BIOS.

Translation

词义的选择

　　英语中的一个词可以分属几种词类；而同一个词在不同的语境中有不同的词义；同一个词和不同的词搭配会有不同的词义。所以，学习英语单词，必须注意它的概念意义和关联意义。翻译时，要根据词在特定句子中的作用，或根据不同的交际场合，或根据上下行文，或根据与其他词的搭配等，选择适当的目的语（这里指汉语）对应词，才能准确地表达该词的意义。如在 "A computer system is made up of a number of different sub-component systems，which together allow the system to perform calculations and complicated tasks."中，三次出现 system 一词，却表示三种不同的汉语意义："a computer system" 译作"计算机系统"；"a number of different sub-component systems"译作"元件"；"allow the system to perform"译作"计算机"。

　　system 在不同学科领域中的译法不同。例如，"system of equations"译作"（方程）组"；"system of notation"译作"（计数）法"；"the postal system"译作"（邮政）制度"；"Her system was harmed by living abroad."中，system 译作"身体"；"You need some system in your life if you want to succeed." 中，system 译作"有条不紊"或"有条理"。

Exercise 1　*Translate the following sentences into Chinese，and pay more attention to the underlined parts.*

1）This allows you to change or modify a file or a program.

2）How much time did they allow us for making the preparations？

3）Computer systems allow you to perform such tasks as solving statistical problems，keeping your company's account books or playing a computer game.

4）We must allow that computers can reach solutions to problems in a fraction of time it takes men to do the job.

5）Also like the disk，memory devices usually hold one or more sets of instructions.

6）A storage device with 16k can hold 16，384 bytes，and one that holds 5 megabytes holds 5 million bytes.

7）You might want to hold the board just above the case plate and see which holes on the case line up with holes on the motherboard.

8）It is difficult to locate a company that doesn't use a microcomputer for some of its processing.

9）The Central Processing Unit and main memory are located in the small cabinet under the screen.

10）Devices in a computer system perform the same functions as human brain.

11）One should always perform what one promises.

Exercise 2　*Translate the following sentences into English.*

1）他们研制了半导体芯片。这些芯片约指甲般大小，能容纳数百个晶体管，使得工程技术人员能够将所有电子装置含有的电路微型化。