

Computer  
Professional  
English Course

# 计算机 专业英语教程

柯晓华 主编



科学出版社

English Course for Computer Specialty

# 计算机专业英语教程

柯晓华 主编

湖北工业大学图书馆



01347926



科学出版社

北京

## 内 容 简 介

本书是以计算机领域的英语文章和国外最新的计算机原版教材为基础编写而成的,内容注重实际应用与教学模式相结合,从而激发学生对计算机专业英语课程学习的热情。作为教材,本书的专业知识涉及信息系统与计算机基础知识、软硬件组成结构、计算机网络的组成及其应用、数据库、数据结构、多媒体技术、信息安全、程序设计和其他深刻影响我们生活的信息技术。本书选材广泛,内容丰富,针对计算机专业英语的应用需求设计许多训练场景,使读者能够快速掌握计算机领域的大量专业英语词汇和相关的语言运用技巧,从而提高课程的实用性。

本书可作为高等院校计算机相关专业(如计算机科学与技术专业、软件工程专业、网络工程专业、电子商务专业、信息管理专业等)的教材,也可作为计算机专业英语培训教材和相关技术人员的自学教材。

### 图书在版编目(CIP)数据

计算机专业英语教程/柯晓华主编. —北京:科学出版社,2013. 1  
ISBN 978-7-03-035940-7

I. 计… II. 柯… III. 电子计算机-英语-高等学校-教材 IV. H31

中国版本图书馆 CIP 数据核字(2012)第 259958 号

责任编辑:杨瑰玉 卜 新 / 责任校对:王望容

责任印制:彭 超 / 封面设计:苏 波

科学出版社出版

北京东黄城根北街16号

邮政编码:100717

<http://www.sciencep.com>

武汉市科利德印务有限公司印刷

科学出版社发行 各地新华书店经销

2013年1月第一版 开本:787×1092 1/16

2013年1月第一次印刷 印张:15

字数:339 000

定价:29.80元

(如有印装质量问题,我社负责调换)

## 前 言

本书是按照教育部 2009 年颁发的《大学英语教学大纲》(修订本)对专业英语的要求,参考国际先进教学理念,尤其是美国计算机协会(Association for Computing Machinery, ACM)推荐的课程体系和内容,编写的面向国际化信息技术人才培养的教材。在满足计算机专业英语教学的同时,本书通过信息技术外包(Information Technology Outsourcing, ITO)的原理和案例介绍,体现了计算机专业英语教学体系的改革新思路。

全书共 8 章,每章包含 3 部分:

Section A:本章专业知识的精读课文、生词和专业术语,布置学习任务。

Section B:本章专业知识的阅读材料,以专业文章和经典教材的内容对本章所涉及的知识领域作补充,布置学习任务。

Section C:语言技巧、学习评估和补充阅读材料。

本书的特色体现于“学习任务”、“语言技巧”和“学习评估”这三个环节的设计。

(1)“学习任务”是根据计算机专业英语的应用场景设计的练习活动。

应用场景	学习任务
职场沟通	第 1、3 章:再现工作场景,完成对话和角色扮演等任务
学术交流	第 2 章:立足学术讨论场景,完成对学科知识的讨论、复述等任务
注释代码	第 4 章:看代码,掌握注释方法,完成为代码写注释的任务
科技翻译	第 5 章:长句翻译。第 2、3、6、7 章:看图阅读并翻译
阅读文献	第 3 章:看图阅读,写摘要。第 8 章:阅读文献,写摘要

(2)“语言技巧”安排如下。

第 1、2 章:讲解专业英语的词汇。

第 3 章:讲解专业英语的语法现象——及物动词的基本句型。

第 4 章:看流程图,并表述出来。看流程图、结构图等;分小组讨论,并选取代表,将流程图用英语说出来;最后,老师发原文,供学生参照。

第 5 章:讲解专业英语的长句翻译。

第 6、7 章:看图阅读并翻译。翻译的材料与本章所学内容相关,增强真实性,让学生活学活用。

第 3、8 章:看图阅读,写摘要。选择国外最新的计算机原版教材中 1000 字左右的报告,让学生组成小组,提炼关键词,写 150 个单词的英文摘要。

(3)“学习评估”目的是在动机上让学生改变对学习课程的态度。通过自我评估见书中(学习成效评估表),要学生总结学到的词一句一段一全文。

通过自我评估,回头看学生的学习过程和思考的变化,从而培养学生的思维,把被

动学习变成主动参与。

特别值得一提的是,“学习任务”的设置融合了角色扮演、双人对话和小组讨论等行之有效的训练方法,采用场景式教学和体验式学习相结合的方式。此举不但实用性强,而且能较好地满足外语课堂教学的需要,有利于学生在课堂上对知识点的消化吸收,打破以往“哑巴英语”“只输入,不输出”的学习模式。

此外,本书的部分章节安排 ITO 的阅读材料,内容涉及 ITO 的现状、案例分析和专家评述等,既为高校教学与 ITO 行业应用接轨提供指导,也为学生毕业后能更快地适应 IT 领域的工作起到引导和促进作用。

柯晓华策划并组织编写本书,姚敏锋、彭振、周明华、李霞、卢伟烈参与编写、修改补充、校订。其中,柯晓华编写第 1、2、6、8 章和附录,姚敏锋编写第 3、5 章,彭振修改补充第 3 章,周明华修改补充第 5 章,李霞编写第 4 章,卢伟烈编写第 7 章,彭振校订各章 Section C。

本书得到教育部人文社会科学研究青年基金项目(11YJC740046),教育部、财政部第五批高等学校特色专业建设项目,广东外语外贸大学普通高等教育“十二五”规划教材资助,特此感谢。

编 者

2012 年 8 月 19 日

# Contents

## 前言

<b>Chapter 1 Information Technology and the Third Industrial Revolution</b> .....	1
Introduction .....	1
Section A Information Technology .....	2
1. Cloud Computing .....	2
2. Modern Information Technology Departments .....	4
3. Hardware .....	5
4. Software .....	6
5. Notes .....	7
6. Exercises .....	8
Section B The Third Industrial Revolution .....	8
1. Five Pillars .....	9
2. 3D Printing in the Third Industrial Revolution .....	11
3. Notes .....	13
4. Exercise .....	13
Section C Review, Reading, Computer Terms and Exercise .....	13
1. Review .....	13
2. Supplementary Reading .....	15
3. Computer Terms .....	16
4. Exercise .....	23
<b>Chapter 2 System Unit</b> .....	25
Introduction .....	25
Section A System Unit, Electronic Data and Instructions .....	25
1. System Unit .....	25
2. Electronic Data and Instructions .....	28
3. Notes .....	30
4. Exercise .....	33
Section B Buses, Ports, Slots, and Power Supplies .....	35
1. Buses .....	35
2. Ports .....	35
3. Expansion Slots .....	37
4. Power Supplies .....	39
5. Notes .....	40

6. Exercises .....	41
Section C Review and Translation .....	42
1. Review .....	42
2. Translation .....	44
<b>Chapter 3 Data Structures</b> .....	47
Introduction .....	47
Section A Fundamentals and Implementation .....	48
1. Data Structure Fundamentals .....	48
2. Data Structures Implementation .....	53
3. Notes .....	64
4. Exercises .....	65
Section B Constructed Data Structures .....	67
1. Customized Data Types .....	67
2. Classes and Objects .....	71
3. Notes .....	74
4. Exercises .....	74
Section C Review and Grammar .....	76
1. Review .....	76
2. Grammar .....	77
<b>Chapter 4 Computer Programming and Its Languages</b> .....	81
Introduction .....	81
Section A Computer Programming .....	81
1. Introduction .....	81
2. Different Types of Computer Programming .....	82
3. Object-Oriented Programming .....	83
4. Programming Style .....	85
5. Notes .....	90
6. Exercises .....	92
Section B Computer Programming Languages .....	94
1. History of Programming Language .....	94
2. Low-level Programming Language .....	96
3. High-Level Programming Language .....	99
4. Notes .....	103
5. Exercises .....	104
Section C Self-evaluation and Review .....	107
1. Self-evaluation .....	107
2. Review .....	109

---

<b>Chapter 5 Operating Systems</b> .....	113
Introduction .....	113
Section A Description of Operating Systems .....	113
1. General Knowledge of Operating Systems .....	113
2. The History of Operating Systems .....	114
3. Note .....	116
4. Exercise .....	117
Section B Components of an Operating System .....	121
1. A Software Survey .....	121
2. The Shell of an Operating System .....	122
3. The Kernel of an Operating System .....	124
4. Notes .....	128
5. Exercises .....	128
Section C Reading and Exercise .....	133
1. Supplementary Reading .....	133
2. Exercise .....	135
<b>Chapter 6 Application Software—Database and Multimedia</b> .....	137
Introduction .....	137
Section A Database .....	137
1. About Database and DBMS .....	138
2. Features .....	139
3. Applications of Databases .....	141
4. Database Development Platforms .....	142
5. Notes .....	145
6. Exercise .....	147
Section B Multimedia .....	149
1. Introduction .....	149
2. The Elements of Multimedia .....	150
3. Interactive Multimedia Applications .....	156
4. Notes .....	157
5. Learning Task .....	158
Section C Review, Reading and Grammar .....	159
1. Review .....	159
2. Supplementary Reading .....	164
3. Grammar .....	165
<b>Chapter 7 Internet</b> .....	167
Introduction .....	167
Section A Internet Communication .....	168



1. The History of the Internet .....	168
2. Web Basics .....	169
3. Accessing the Internet .....	172
4. Notes .....	173
5. Exercise .....	175
Section B Internet Applications .....	177
1. Communication .....	177
2. Web Search Engine .....	179
3. Electronic Commerce .....	180
4. Data Transfer .....	181
5. Globalization and the 21st Century .....	182
6. Notes .....	183
7. Exercises .....	184
Section C Reading, Grammar and self-evaluation .....	187
1. Supplementary Reading .....	187
2. Grammar .....	189
3. Self-evaluation .....	190
<b>Chapter 8 Computer Network</b> .....	193
Introduction .....	193
Section A Network Software .....	194
1. Example Networks .....	194
2. Protocol Hierarchies .....	197
3. Types of Networks .....	198
4. Notes .....	201
5. Exercises .....	202
Section B Network Hardware .....	203
1. Guide .....	203
2. Physical Communication Channel .....	204
3. Basic Hardware Components .....	206
4. Notes .....	210
5. Exercise .....	210
Section C Review and Abstracting .....	213
1. Review .....	213
2. Writing an Abstract .....	214
<b>References</b> .....	221
<b>Appendix Common Vocabulary in English for Computer Specialty</b> .....	223

# Chapter 1 Information Technology and the Third Industrial Revolution

## Introduction

Researchers use the term **information technology (IT)** to refer to an **entire** industry. In actuality, information technology is the use of computers and software to manage information. In some companies, this is referred to as **management information services (MIS)** or simply as **information systems (IS)**. The information technology department of a large company would be responsible for storing information, protecting information, processing information, **transmitting** information, and **retrieving** information as necessary. All of these approaches go on with the help of computers.

The purpose of this book is to help you become **competent** with reading, writing, understanding, and speaking computer-related

entire  
[in'taiə]  
adj. 全部的; 整个的

transmitting  
[trænz'mitiŋ]  
vt. 传递

retrieving  
[ri'tri:vɪŋ]  
vt. [电脑] 检索, 撷取(信息)

competent  
['kɒmpitənt]  
adj. 有能力的; 称职的

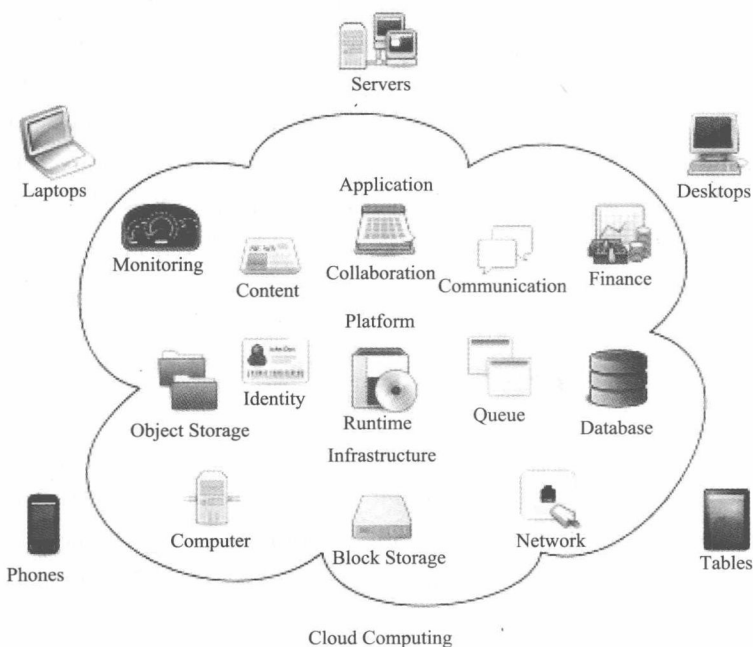


Figure 1-1 Cloud computing logical diagram

essence	[ˈesns]	n. 本质; 精华
maintain	[meɪnˈteɪn]	vt. 维修; 保持
branch	[brɑːntʃ]	n. (学科的) 分科
acquisition	[ækwiˈziʃən]	n. 获得; 取得
dissemination	[diːsemiˈneɪʃən]	n. 散播; 宣传
vocal	[ˈvəʊkəl]	adj. 声音的
pictorial	[pɪkˈtɔːriəl]	adj. 用图表示的
bioinformatics	[baɪəʊˌɪnfəˈmætɪks]	n. 生物信息学
capacity	[kəˈpæsɪti]	n. 容量
obscure	[əbˈskjʊə]	adj. 模糊的; 难解的
metaphor	[ˈmetəfə]	n. 比喻

topics in English language. They include the introduction of information technology and the third industrial revolution, the description of cloud computing and the Internet of things, and how to effectively use those portable personal devices and the essences of how to maintain your modern digital life.

In this chapter, we present an overview of information technology from the perspective of cloud computing: the application, platform, and infrastructure (see Figure 1-1). To be competent with computer technology, you need to know and understand the trend and main content inside the third industrial revolution.

## Section A Information Technology

**Information technology** is the branch of engineering that deals with the use of computers to store, retrieve and transmit information. The acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications are its main fields. The term in its modern sense first appeared in 1958 article published in the *Harvard Business Review* in which authors Leavitt and Whisler commented that “the new technology does not yet have a single established name. We shall call it information technology (IT)”. Some of the modern and emerging fields of information technology are next generation **web technologies**, **bioinformatics**, **cloud computing**, **global information systems**, large scale **knowledge bases**, etc. Advancements are mainly driven in the field of computer science.

### 1. Cloud Computing

Cloud computing is the delivery of computing and storage capacity as a service to a community of end-recipients. The origin of the expression cloud computing is obscure, but it appears to derive from the practice of using drawings of stylized clouds to denote networks in diagrams of computing and communication systems. The term cloud is used as a metaphor for the Internet, based on the standardized use of a cloud-like shape to denote a networked on

telephony **schematics** and later to **depict** the Internet in computer network diagrams as an abstraction of the underlying infrastructure it represents. Cloud computing **entrusts** services with a user's data, software and computation over a network, see Figure 1-2.



Figure 1-2 Cloud computing services users

There are three types of cloud computing:

- **Infrastructure as a Service (IaaS)**—Using Infrastructure as a Service, users rent use of servers (as many as needed during the rental period) provided by one or more cloud providers.
- **Platform as a Service (PaaS)**—Using Platform as a Service, users rent use of servers and the system software to use in them.
- **Software as a Service (SaaS)**—Using Software as a Service, users also rent application software and databases.

The cloud providers manage the infrastructure and platforms on which the applications run. End users access cloud-based applications through a Web browser or a **lightweight** desktop or mobile app while the business software and user's data are stored on servers at a remote location. **Proponents** claim that cloud computing allows enterprises to get their applications up and running faster, with improved manageability and less maintenance, and enables IT to more rapidly **adjust** resources to meet **fluctuating** and unpredictable business demand.

Cloud computing relies on sharing of resources to achieve coherence and economies of scale similar to a utility (like the electricity grid) over a network (typically the Internet). At the foundation of cloud computing is the broader concept of converged infrastructure and shared services.

schematic

[ski'mætik] n. 简图

depict

[di'pikt]

vt. 描画, 调出

entrust

[in'trʌst]

vt. 委托; 托管

lightweight

['lait,wet]

adj. 轻量级的

proponent

[prə'pəunənt]

n. 提议人; 拥护者

adjust

[ə'dʒʌst]

vt. 调节; 改变...以  
适应

fluctuating

['flʌktʃueitiŋ]

n. 波动; 涨落

erroneously  
[i'rəʊniəsli]  
adv. 错误, 不正确

synonym  
['sɪnənim]  
n. 同义词

## 2. Modern Information Technology Departments

In order to perform the complex functions required of information technology departments today, the modern Information Technology Department would use computers, servers, information systems, and cryptography. The department would be made up of several System Administrators, Database Administrators and at least one Information Technology Manager. The group usually reports to the Chief Information Officer (CIO).

An **information system** is the system of person, data records and activities that process the data and information in a given organization, including manual processes or automated processes. Usually the term is used **erroneously** as a **synonym** for computer-based information systems, which is only the information technologies component of an information system. Meanwhile, nowadays, from the computer scientific perspective, an information system can be described in six objects: people, procedures, software, hardware, data, and connectivity(see Figure 1-3).

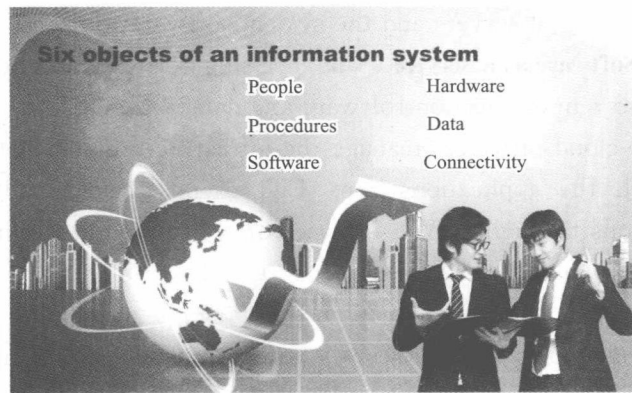


Figure 1-3 The six objects of an information system

- **People:** It is easy to overlook people as one of the six parts of an information system. However, it is the most important part. As this is what microcomputers are all about—making people and end users like you, more productive.

• **Procedure:** The rules or guidelines for people to follow when using software, hardware, and data are procedures. It can indicate a sequence of activities, tasks, steps, decisions, calculations and processes, that when undertaken in the sequence laid down produces the described result, product or outcome. For example, software and hardware manufacturers provide manuals with their products with the procedures of how to use them.

• **Software:** A program consists of the step-by-step instructions that tell the computer how to do its work. The purpose of software is to convert data into information. For example, a payroll program would instruct the computer to take the number of hours you worked in a week (data) and multiply it by your pay rate (data) to determine how much you are paid for the week (information).

• **Hardware:** The equipment that processes the data to create information is called hardware. It includes the keyboard, mouse, monitor, system unit and other devices. Hardware is controlled by software.

• **Data:** The raw, unprocessed facts, including text, numbers, images, and sounds, are called data. Processed data yields information.

• **Connectivity:** It allows computers to connect and to share information via computer networks. These connections, including the Internet can be accessible by telephone lines, by cables, or through the air. It allows users to greatly expand the capability and usefulness of their information systems.

### 3. Hardware

Hardware is a general term that refers to the physical **artifacts** of a technology. It may also mean the physical components of a computer system.

Hardware historically meant the metal parts and fittings that were used to make wooden products stronger, more functional, longer lasting and easier to **fabricate** or assemble. In modern usage, it includes equipments such as keys, locks, **hinges**, **latches**, corners, handles, wires, and machine parts, especially when they are made of metal.

In the electronics and especially computer industries, computer hardware specifically means the physical or tangible

artifact	
[ˈɑːtɪfækt]	
n. 人造物品	
fabricate	
[ˈfæbrɪkeɪt]	
vt. 编造, 伪造	
hinge	
[ˈhɪndʒ]	
n. 铰链	
latch	
[lætʃ]	
n. 门闩	

parts of the equipment, such as circuit boards, keyboards, monitors etc. , as shown in Figure 1-4, in contrast to non-physical software running on the computer or other device.

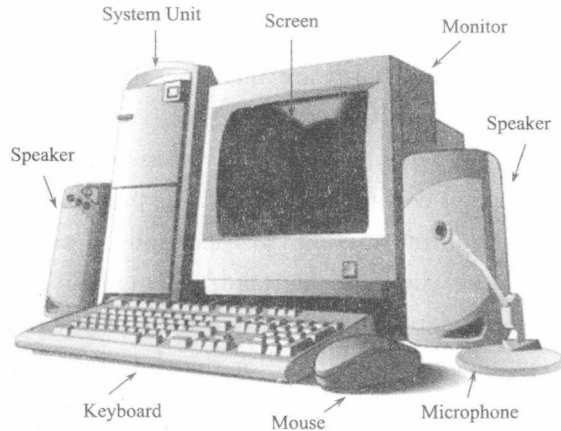


Figure 1-4 Hardware of a personal computer

#### 4. Software

Software can be defined as any data processed with hardware such as data on a static recording medium or an active electronic signal. **Computer software** is a general term used to describe a collection of computer programs, procedures and documentation that perform some task on a computer system. The term includes **application software** such as word processors which perform productive tasks for users, **system software** such as operating systems, which interface with hardware to provide the necessary services for application software, and **middleware** such as utilities which control and coordinate distributed systems. They can be referred to Figure 1-5.

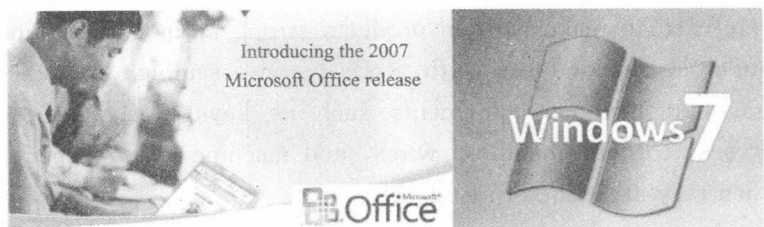


Figure 1-5 Software

### What are the differences between data and information?

The purpose of software is to convert **data** (raw, unprocessed facts) into **information** (processed facts). Data in everyday language is a synonym for information. In the exact sciences, there is a clear distinction between data and information. Data is a measurement that can be disorganized and when the data becomes organized it becomes information.

Raw data includes numbers, characters, images or other outputs from devices to convert physical quantities into symbols, in a very broad sense. Such data is typically further processed by a human or input into a computer, stored and processed there, or transmitted (output) to another human or computer.

Information is the result of processing, gathering, manipulating and organizing data in a way that adds to the knowledge of the receiver. In other words, it is the context in which data is taken.

## 5. Notes

**信息技术(Information Technology)**:有关数据与信息的应用技术。其内容包括:数据与信息的采集、表示、处理、安全、传输、交换、显现、管理、组织、存储、检索等。

**信息系统(Information System)**:由计算机硬件、网络和通信设备、计算机软件、信息资源、信息用户和规章制度组成的、以处理信息流为目的的人机一体化系统。

**计算机硬件(Computer Hardware)**:计算机系统中由电子、机械和光电元件等组成的各种物理装置的总称。这些物理装置按系统结构的要求构成一个有机整体,为计算机软件运行提供物质基础。现在,人们常把计算机硬件当做主机箱和外部设备的统称。主机箱内主要包括 CPU、内存、主板、硬盘驱动器、光盘驱动器、各种扩展卡、连接线、电源等,外部设备包括鼠标、键盘、显示器、音箱等,这些设备通过接口、连接线与主机相连。

**计算机软件(Computer Software)**:计算机系统程序及其文档。程序是计算任务的处理对象和处理规则的描述,文档是为了了解程序所需的阐明性资料。程序必须装入机器内部,才能工作;文档一般是给人看的,不一定装入机器。计算机软件总体分为系统软件和应用软件两大类:系统软件是各类操作系统,如 Windows、Linux、UNIX 等,还包括操作系统的补丁程序及硬件驱动程序,都是系统软件类。应用软件可以细分的种类就更多了,如



outline  
 ['aʊlən]  
 vt. 概述

endorse  
 [in'dɔ:s]  
 vt. 赞同, 认同

工具软件、游戏软件、管理软件等,都属于应用软件类。

## 6. Exercises

### I. Matching

maintain	编造; 伪造
retrieve	同义词
acquisition	拥护者
depict	波动; 涨落
obscure	模糊的; 难解的
fluctuate	描画
proponent	获得; 习得
synonym	检索
fabricate	维修; 保持

### II. Respond to each question or statement

(1) Describe briefly the types of cloud computing.

(2) List and briefly explain the six parts of a typical Information System.

(3) Explain the differences between data and information.

(4) Briefly introduce the components of a personal computer to your partner.

## Section B The Third Industrial Revolution

The Third Industrial Revolution is a concept and vision **outlined** by Jeremy Rifkin and **endorsed** by the European Parliament in 2007. Throughout history, economic transformations occur when new