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## UNIT 1

### OPTICAL STORAGE

#### **Task 1      Discuss these questions.**

1. What do CD & DVD stand for?
2. What is the main advantage of using DVDs instead of CDs?

#### **Task 2      How do you say these expressions in Vietnamese.**

Access the internet – word processor – four-digit PIN – PIN-protected card – multimedia – assembly line – network architecture – expansion slot – circuit board – binary system – upper-case character – speech recognition system – digitized image -

#### **Task 3      Read the text below and find the following.**

1. the advantages and disadvantages of optical discs over magnetic disks
2. the storage capacity of a double-sided, dual layer DVD
3. the difference between a DVD burner and a DVD recorder
4. the features of a portable DVD player which allow the user to play different formats
5. two possible successors to DVDs
6. where the Blu-ray format gets its name from

### OPTICAL DISKS AND DRIVES

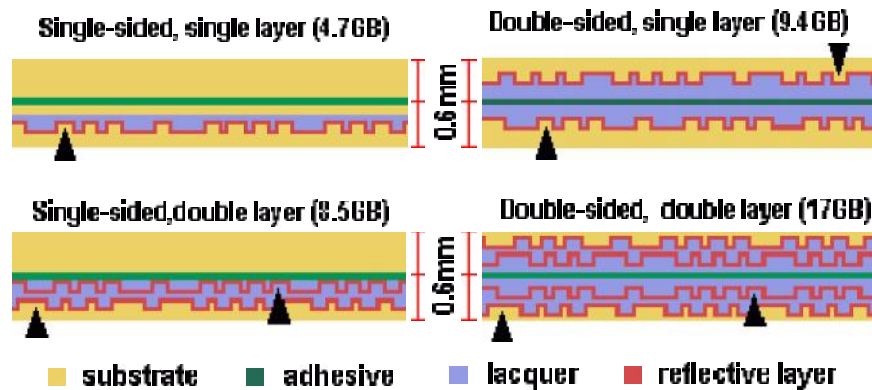
Optical discs can store data at much higher densities than magnetic disks. They are therefore ideal for multimedia applications where images, animation and sound occupy a lot of disc space. Furthermore, optical discs are not affected by magnetic fields, meaning that they are secure and stable, and can be transported through airport metal detectors without damaging the data. However, optical drives are slower than hard drives.

#### **CDs and DVDs**

At first sight, a DVD is similar to a CD. Both disks are 120 mm in diameter and 1.2 mm thick. They also both use laser beam to read data. However, they are very different in internal structure and data capacity. In a DVD, the tracks are very close together, thus

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allowing more tracks. The pits in which data is stored are smaller, there are more pits per track. As a result, a CD can hold 650 – 700MB, whereas a basic DVD can hold 4.7GB. In addition, a DVD can be double-sided and dual layer, with a capacity of 18GB.



CDs come in three different formats:

- ) CD-ROMs (read-only memory) are read-only units, meaning you cannot change the data stored on them (for example, a dictionary or a game).
- ) CD-R (recordable) discs are write-once devices which let you duplicate music CDs and other data CDs.
- ) CD-RW (rewritable) discs enable you to write onto them many times, just like a hard disk.

DVDs also come in several formats:

- ) DVD-ROMs are used in DVD computer drives. They allow for data archiving as well as interactive content (for example, an encyclopedia or a movie).
- ) DVD-R or DVD+R can only be recorded on once.
- ) DVD-RW discs can be erased and re-used many times. They are used to back up data files and to record audio and video.

The DVD drive used in computers is also called a DVD burner because it records information by burning via a laser to a blank DVD disc. However, a DVD recorder typically refers to a standalone unit which resembles a video cassette recorder. New DVD recorder can play all CD and DVD formats. There are also portable DVD players - handheld devices which let you watch movies on TV, play games and listen to music, wherever you are. They come with a built-in DVD drive and widescreen (rectangular 16:9 format) LCD display. They usually support multi-format playback- that is, they can play many file formats, including DVD-video, DivX, CD audio discs, MP3 music and JPEG images.

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## HD-DVD and Blu-ray discs

These two competing formats are expected to replace current DVD as the standard for watching movies at home. On one side are Toshiba, Microsoft and the DVD Forum, who support the High Definition-DVD (HD-DVD). Sony, Panasonic, Samsung, JVC and many movie studios are behind the Blu-ray format.

A Blu-ray disc has a capacity of 25GB (single layer), 50GB (dual layer) and 100GB (four layers). Unlike DVDs, which use a red laser to read and write data. Blu-ray uses a blue-violet laser, hence its name. Blu-ray discs can record and play back high-definition television and digital audio, as well as computer data.

**Task 4**      **Read the text again and make notes about the features of CDs, DVDs and Blu-ray discs.**

	Capacity and formats	Possible uses
CD		
DVD		
Blu-ray		

**Task 5**      **Look at these extracts from the text and put the words in bold into the correct column of the table.**

1. They are **therefore** ideal for multimedia applications.
2. **Furthermore**, optical discs are not affected by magnetic fields.
3. **However**, they are very different in internal structure and data capacity.
4. **As a result**, a CD can hold 650-700MB, **whereas** a basic DVD can hold 4.7GB.
5. **In addition**, a DVD can be double-sided and dual layer.

Indicating addition	Making contrasts	Explaining the results or effects of something

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**Task 6**      **Choose the correct words in brackets to complete these sentences.  
Put them into the correct column of the above table.**

1. (Although/Consequently) CDs and DVDs are similar in size and shape, their data structure is very different.
2. DVD holds more data than CDs. The pits burnt into the disc are smaller than on a CD, and the tracks are closer together. (On the other hand/As a result), DVDs can have up to four recordings layers.
3. A Blu-ray disc drive costs a lot of money (but/so) you should use it carefully..
4. Blu-ray is expected to replace DVD over the coming years (because/besides) it offers much greater storage capacity.
5. Both Blu-ray (and/in addition) HD-DVD devices are backward-compatible with current CDs and DVDs, meaning you can play your old discs on the new players.
6. Sony has invested millions of dollars in the development of Blu-ray technology. The success of Blu-ray is (whereas/therefore) vital for the company's future.

**Task 7**      **Study the products in the computer catalogue and choose the most suitable device for the purposes (1-6). Give reasons for your choices.  
Try to use some connectors to make your statements more logical.**

1. To keep the operating system and the programs on a home computer.
2. To watch a movie on a plane or in the back seat of a car
3. To hold your favourite photos and music
4. To make backup copies and to transport files between computers in a big company.
5. To hold historical records in the National Library
6. To read, write and re-write high-definition video and TV

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**Seagate hard drive**

Superfast 8ms hard drive. Capacity ranges from 80GB to 1TB.

**Iomega portable hard drive**

160GB, 2.5" external hard drive. An affordable way to back up all your data, from business documents to emails.

**LaCie DVD drive**

16x DVD writer with free Nero DVD burning software. Can play and record both DVD+R and DVD-R discs, plus their rewritable counterparts, as well as all types of CD.

**Panasonic portable DVD player**

8" portable LCD DVD Player with Car Kit. Compatible with DVD-Video, CD, JPEG image CD and MP3-formatted audio CD.

**Sony Blu-ray disc drive**

Sony's Vaio AR laptop is the first portable Blu-ray studio, which includes a Blu-ray disc drive and a TV tuner, alongside a 17" widescreen display and a 2GHz Intel Core Duo processor.

**Toshiba USB flash drive**

High-speed 16GB pen drive with a built-in MP3 player. Plug directly into any USB connection.

**Task 8      What's the basic meaning of these compound nouns?**

**Group A:** Network computer – notebook computer – palmtop computer – laptop computer – desktop computer – handheld computer – mainframe computer – microcomputer

**Group B:** computer network - computer system – computer engineer – computer language - computer room – computer consultant

**Group C:** database – data block – data bus – data communication – data stream  
data field – data flow

**Group D:** bar code – colour code – machine code – 8-digit code – source code – object code

**Group E:** assembly language – high-level language – low-level language – computer language – markup language – programming language – symbolic language

[Type here]

**Task 9      A device that scans bar codes is called a bar code scanner. What name is given to:**

1. A device that reads magnetic cards?
2. A unit that gives a visual display of information on a screen?
3. A device that plots graphs?
4. A device that prints using a laser as the light source?
5. A device that prints using a jet of ink?
6. The rate of transmission of data?
7. A package for making presentations using multimedia?
8. A device used to input data to a computer?
9. A device used to read characters by optical means?

**Task 10      Listen to the recording “How a CD works and its anatomy” then complete the following sentences.**

1. The sound (data) track on a CD starts at the ..... of the disc and ..... outwards. It is a series of ..... spots and .....
2. If we straightened it out into a straight ....., it would be ..... miles long.
3. In a CD drive, there are ..... main components: a drive motor, a ..... with lens pair and a ..... mechanism.
4. The function of the drive motor is to ..... the disc. The laser is used to ..... a laser beam onto the .....
5. If the beam hits a flat ..... surface, it ..... back towards a sensor which ..... that ..... light and recognizes as binary one.
6. If the beam hits a bump and since the bump is not ....., the sensor ..... pick up reflected light, recognizing binary .....
7. From this series of flat ..... and bumps, we can get a ..... of ones and zeros digitally.
8. Putting these digital signals into a ..... converter to take out ..... signals (sound waves).
9. The thickness of CDs are usually ..... millimeters. Most of the disc is ..... plastic which is a ..... substance and is coated with a thin ..... of aluminum and on top of this aluminum layer is one of ..... to ..... the aluminum.
10. The read-only CD (CD-ROM) can only be written on by manufacturer; we couldn't erase and ..... it again. Unlike CD-ROM, the recordable CD (CD-R) can be ..... by .....

[Type here]

11. On this kind of disc, there are no ..... and flat areas imprinted on plastic. Between the protective layer and the reflective aluminum, there's a layer of .....
12. Normally, the dye is translucent. The laser light will ..... through it, ..... the reflective aluminum and bounce back.
13. A CD-R drive has a higher-powered ..... than normal, which generates ..... when it strikes the disc, changing the light-sensitive dye and making a tiny black spot. This indicates that a ..... is stored on the disc at that point.
14. In places where the dye is ..... the laser light reflects straight back, indicating that a ..... is stored on the .....

## UNIT 2

### FLASH MEMORY

**Task 1** Flash memory is used in many handheld devices. Match the descriptions (1-6) to the picture (a-f).

1. This handheld console lets you play game stored on ROM game cards, which have a small amount of flash memory to save user data, for example high scores.
2. This flash memory card is used as 'digital film' to store images on a digital camera.
3. This wireless LAN card allows laptop and PDA users to access the Internet from any Wi-Fi access point.
4. This USB flash pen drive is the latest mobile drive for your computer.
5. It looks like an ordinary watch, but this USB drive from Edge Tech can store up to 1GB of flash memory. It will let you save and transfer your photos, songs and data files easily.
6. This flash-based player provides everything you need to play music and store data on the go. It also comes with a built-in FM radio and voice recorder.



**Task 2** Study the title of the text. Why is it a suitable title for an article about flash memory? Read the first paragraph of the text to find out.



[Type here]

**Task 3      Read the whole text and decide which paragraphs are most likely to contain answers to these questions.**

1. What is flash memory?
2. How much data can a flash memory card hold?
3. What are the differences between flash drives and external hard drives?
4. What can devices which use multi-level cell technology do?
5. What is the advantage of using U3 technology in flash drives?
6. What are the differences between RAM memory and flash memory?
7. What is the name of the flash card created by Sony for its digital camera?

### **MEMORY IN A FLASH**

Flash memory is a type of non-volatile memory that can be electronically erased and reprogrammed. Its name was invented by Toshiba to express how much faster it could be erased – ‘in a flash’, which means ‘very quickly’.

Unlike RAM, which is volatile, flash memory retains the information stored in the chip when the power is turned off. This makes it ideal for use in digital cameras, laptops, network switches, video game cards, mobile phones and portable multimedia players. In addition, it offers fast read access times (although not as fast as RAM), with transfer rates of 12MB per second. Unlike ROM chips, flash memory chips are rewritable, so you can upgrade programs via software.

Inside the chip, data is stored in several floating gate transistors, called cells. Each cell traditionally stores one bit of data (1= erased and 0= programmed). New devices have a multi-level cell structure so they can store more than one bit per cell. The chips are constructed with either NOR or NAND gates. NOR chips function like a computer’s main memory, while NAND works like a hard drive. For example, in a camera, NOR flash contains the camera’s internal software, while NAND flash is used to store the images.

Flash memory is used in several ways:

- ) Many PCs have their BIOS (basic input/output system) stored on a flash memory chip so it can be updated if necessary.
- ) Modems use flash memory because it allows the manufacturer to support new protocols.
- ) USB flash drives are used to save and move MP3s and other data files between computers. They are more easily transported than external hard drives because they use solid-state technology, meaning that they don’t have fragile moving

[Type here]

parts that can break if dropped. However, USB flash drives have less storage capacity than hard drives.

- ) New U3 smart drives allow users to store both applications and data. They have two drive partitions and can carry applications that run on the host computer without requiring installation.
- ) Flash memory cards are used to store images on cameras, to back up data on PDAs, to transfer games in video consoles, to record voice and music on MP3 players or to store movies on MP4 players. They are as small as a stamp, and capacity can range from 8MB to several gigabytes. The only limitation is that flash cards are often not interchangeable between devices. Some formats include: CompactFlash, Secure Digital, MultiMedia Card, miniSD card, and xD-Picture Card. Sony has its own product called the Memory Stick, used in its digital still cameras, video camcorders and the PlayStation Portable. The photos stored in a digital camera can be offloaded to a computer via cable or wirelessly. Another option is to have a flash card reader permanently connected to your PC; you simply eject the card from the camera and put it into the reader instead of having to plug the camera in.

The future of hard drives may be hybrid hard drives. Hybrid hard drives combine a magnetic hard disk and flash memory into one device. This allows computers to boot, or start, more quickly, and also reduces power consumption.

**Task 4 Find words or phrases in the text with the following meanings.**

1. permanent; able to hold data without power
2. able to be rewritten many times
3. different sections of a disk drive or storage area
4. to make a copy of a file so that the original is not lost
5. transferred to another device
6. a peripheral device that reads and writes flash memory cards
7. a product that integrates two different technologies

**Task 5 Try to form as many words as you can from *blog*, *mail* and *print* using affixation (adding a prefix or suffix), conversion (turning a noun into a verb and vice versa) and compounding (putting two or more words together). Make sentences with each of them.**

[Type here]

Blog	Mail	Print
Blogger (a person who writes a blog)	To mail (the verb form)	Printout (the pages produced by the printer)

**Task 6** Choose the correct word in brackets to complete the description of a digital voice recorder.

**Olympus WS-320M digital voice recorder**

Slim, attractive, and highly functional, the Olympus WS-320M digital voice recorder packs 1GB of internal flash memory into its (brighted/lightweight/lighter) housing, letting you record up to 277 hours of high-quality audio in WMA format. It's ideal for (record/recordable/recording) notes or long lectures, interviewing people, or capturing song ideas before they disappear. As an added bonus, the WS-320M can store up to 266 WMA or MP3 songs for high-quality stereo (player/playback/playoff).

The WS-320M features five separate file (folds/folding/folders), capable of holding 199 files each, so you can organize nearly 1,000 files by subject, theme or other category. Users also have the choice of four recording modes: HQ for high-quality audio, LP and SP for extended recording times, and ST HQ for stereo recording. And thanks to the voice (activation/activate/active) option, users don't need to press a single button to start recording – the WS-320M will record as soon as the built-in microphone picks up sound.

Perhaps the most convenient feature, however, is the built-in USB (connector/connect/connected), which eliminates the need for a USB cable. Once this is connected, you can (downloadable/download/upload) music files, images or documents from your PC, in effect turning the recording into a small hard drive. You can even transfer voice recordings to your computer for (store/storage/storeroom) or multimedia use.

**Task 7** Choose a flash-based device that you own and describe it.

**Task 8** You have received a text from a friend at a computer show. Write a short reply.

*Hi. At the computer show in town. Need a new media player. What's the difference between MP3 & MP4 players? What features should I look for?*

*Thanks!*

[Type here]

**Task 9**      The list below is made up of four groups of words (topic sets), consisting four main categories and example of each category. Find the topic sets and then write sentences to show the relationship between the groups of words. Use a different marker for each sentence. One has been done for you.

Trackball – mainframe – PC – microcomputer – programming language - mouse  
– input device – output device – printer – COBOL – desktop computer –  
keyboard – PASCAL – BASIC – scanner - laptop computer – monitor – speaker

**Example:** Mainframe, PC, microcomputer, desktop computer, laptop computer are all examples of different types of computers.

**Task 10**      Refer to these websites:  
<http://usbflashrecovery.com/flash-drive-whats-inside/>  
<https://howflashdriveworks.wordpress.com/what-is-a-flash-drive/>  
<https://www.scienceabc.com/innovation/usb-type-c-different-usb-type-type-b.html>  
and other related ones to write an explanation of:  
a/ The anatomy of a typical USB flash drive (functions of its main components)  
b/ The differences of USB type A, USB type B and USB type C.

(The explanation must be written in your own words - do not copy & paste- and should not exceed 30 sentences)

## UNIT 3

### COMPUTER LANGUAGES

**Task 1      Read the text. How many high-level computer languages are mentioned?**

### COMPUTER LANGUAGES

Unfortunately for us, computers can't understand spoken English or any other natural language. The only language they can understand directly is machine code, which consists of 1s and 0s (binary code).

Machine code is too difficult to write. For this reason, we use symbolic languages to communicate instructions to the computer. For example, assembly languages use abbreviations such as ADD, SUB, MPY to represent instructions. The program is then translated into machine code by a piece of software called an assembler. Machine code and assembly languages are called low-level languages because they are closer to the hardware. They are quite complex and restricted to particular machines. To make the programs easier to write, and to overcome the problem of intercommunication between different types of computer, software developers designed high-level languages, which are closer to the English language. Here are some examples:

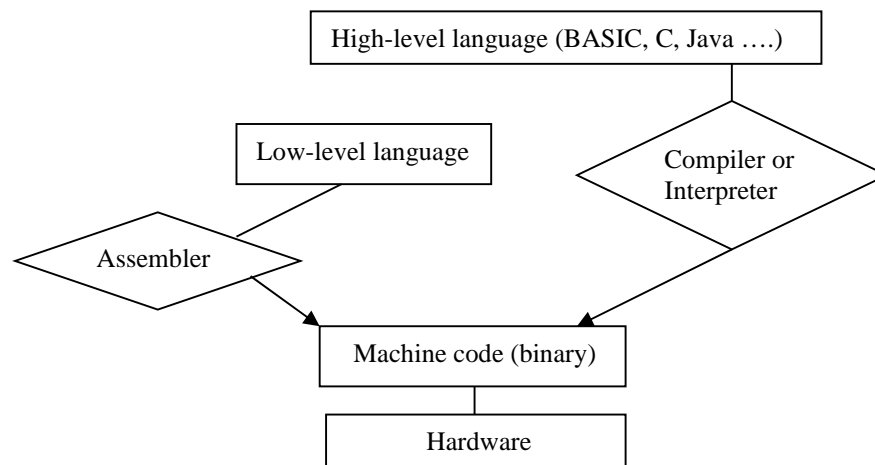
- ) FORTRAN was developed by IBM in 1954 and is still used for scientific and engineering applications.
- ) COBOL (Common Business Oriented Language) was developed in 1959 and is mainly used for business applications.
- ) BASIC was developed in the 1960s and was widely used in microcomputer programming because it was easy to learn. VISUAL BASIC is a modern version of the old BASIC language, used to build graphical elements such as buttons and windows in Windows programs.
- ) PASCAL was created in 1971. It is used in universities to teach the fundamentals of programming.
- ) C was developed in the 1980s of AT&T. It is used to write system software, graphics and commercial applications. C++ is a version of C which incorporates object-oriented programming: the programmer concentrates on particular things (a piece of text, graphic or a table, .) and gives each object functions which can be altered without changing the entire program. For example, to add a new

[Type here]

graphics format, the programmer needs to rework just the graphics object. This makes programs easier to modify.

- ) JAVA was designed by Sun in 1995 to run on the web. JAVA applets provide animation and interactive features on web pages.

Programs written in high-level languages must be translated into machine code by a compiler or an interpreter. A compiler translates the source code into object code- that is, converts the entire program into machine code in one go. On the other hand, an interpreter translates the source code line by line as the program is running.



It is important not to confuse programming languages with markup languages, used to create web documents. Markup languages use instructions, known as markup tags, to format and link text files. Some examples include:

- ) HTML, which allows us to describe how information will be displayed on web pages.
- ) XML, which stands for Extensible Markup Language. While HTML uses pre-defined tags, XML enables us to define our own tags; it is not limited by a fixed set of tags.

```
<xml>
< name> Andrea Finch. </name>
< homework> Write a paragraph describing the C language </homework>
</xml>
```

In this XML example we have created two new tags: <name> and <homework>

- ) VoiceXML, which makes web content accessible via voice and phone. VoiceXML is used to create voice applications that run on the phone, whereas HTML is used to create visual applications (for example, web pages).

[Type here]

**Task 2 Match the words (1-7) to the definitions (a-g).**

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>a. Program instructions written in a particular computer language</li><li>b. The techniques of detecting and correcting errors (or bugs) which may occur in programs</li><li>c. A diagram representing the successive logical steps of the program</li><li>d. A special program which converts the source program into machine code – the only language understood by the processor</li><li>e. The basic instructions understood by computers; it consists of 1s and 0s (binary code)</li><li>f. A type of programming where programs are made from combinations of predefined modules that can be used over and over again</li><li>g. A kind of language that is closer to the form that a computer can understand</li></ul> | <ul style="list-style-type: none"><li>1. Flowchart</li><li>2. Source code</li><li>3. Compiler</li><li>4. Machine code</li><li>5. Debugging</li><li>6. Low-level language</li><li>7. Object-oriented programming</li></ul> |
|---|---|

**Task 3 Read the text again and answer these questions.**

- 1. Do computers understand human languages? Why?/Why not?
- 2. What is the function of an assembler?
- 3. Why did software developers design high-level languages?
- 4. Which language is used to teach programming techniques?
- 5. What is the difference between a compilers and an interpreter?
- 6. Why are HTML and VoiceXML called markup languages?

**Task 4 Complete these sentences with a computer language from the text.**

- 1. .... allows us to create our own tags to describe our data better. We aren't constrained by a pre-define set of tags the way we are with HTML.
- 2. IBM developed ..... in the 1950s. It was the first high-level language in data processing.
- 3. .... applets are small programs that run automatically on web pages and let you watch animated characters, play games. etc.
- 4. .... is the HTML of the voice web. Instead of using a web browser and a keyboard, you interact with a voice browser by listening to pre-recorded audio output and sending audio input through a telephone.
- 5. This language is widely used in the business community. For example, the statement ADD VAT to NET-PRICE could be used in a ..... program.

[Type here]

**Task 5      Complete the sentences with correct parts of speech from  
*program, compile, bug/debug***

1. .... is the process of writing using a computer language.
2. A computer ..... is a set of instructions that tells the computer how to do a specific task.
3. Programs written in a high-level language require ....., that is translation into machine code, the language understood by the processor.
4. Any error or malfunction of a computer program is known as .....
5. Most computer ..... make a plan of the program before they write it.
6. A..... is a program used to test and ..... other programs.
7. A source program is converted into machine code by software called a .....
8. Programmers usually ..... their programs to generate an object program and diagnose possible errors.
9. The process of going through the code to identify the cause of errors and fixing them is called .....

**Task 6      Make sentences using these prompts.**

1. not easy / write instructions in COBOL
2. expensive / set up a data-processing area
3. advisable / test the programs under different conditions
4. unusual / write a program that works correctly the first time it's tested
5. important / use a good debugger to fix errors
6. easy / learn Visual BASIC

**Task 7      Choose the correct words (a- c) to complete these sentences.**

1. We use high-level languages because machine code is too difficult ....., understand and debug.  
a. read                      b. reading                      c. to read
2. I went on the course ..... how to be a better programmer.  
a. learn                      b. to learn                      c. for to learn
3. I'm not interested in ..... that computer language.  
a. learning                      b. learn                      c. to learn
4. He refuses ..... the project with me.  
a. do                      b. doing                      c. to do
5. The engineers warned the employees not ..... the cables.  
a. touch                      b. to touch                      c. touching



[Type here]

6. They may not ..... to the conference.  
a. come                      b. coming                      c. to come
7. Spyware can make your PC ..... more slowly.  
a. perform                      b. performing                      c. to perform
8. This program is too slow ..... the simulation.  
a. do                      b. to do                      c. doing

**Task 8 Study the descriptions of Visual Basic and VoiceXML then complete the following specification chart.**

	Visual BASIC	VoiceXML
What does Visual BASIC & VoiceXML: stand for ?		
When was it developed ?		
What are its main features ?		
What is it used for ?		

Visual BASIC was developed by Microsoft in 1990. The name BASIC stands for Beginner's All-purpose Symbolic Instruction Code. The adjective Visual refers to the technique used to create a graphical user interface. Instead of writing a lot of instructions to describe interface elements, you just add pre-defined objects such as buttons, icons and dialog boxes. It enables programmers to create a variety of Windows applications.	VoiceXML (Extensible Markup Language) was created in 2000 to make web content accessible via the telephone. For input, it uses voice recognition. For output, it uses pre-recorded audio content and text-to-speech. Applications: J voice portals, where you can hear information about sports, news, traffic, etc. J voice-enabled intranets (private networks). J voice e-commerce. J home appliances controlled by voice.
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[Type here]

**Task 9** Complete each gap in these sentences with the appropriate form of the correct verb from the list.

Back up – build up – catch up – free up – keep up – set up – start up – update  
upgrade – upload

1. To avoid losing data, you should ..... your files regularly.
2. You can ..... your PC by adding a new motherboard.
3. Delete some files to ..... space on your hard disk.
4. Data is ..... from regional PCs to the company's mainframe each night.
5. The operating system boots when you ..... your computer.
6. She's taking a course to ..... her knowledge of computing.
7. The computer checks the memory when it .....
8. He ..... a website to advertise his travel company.
9. You can ..... with developments by reading PC magazines.
10. If you miss a class, you can study the hand-outs to .....
11. The image in a digital camera is ..... from a red, green, and blue mage.

**Task 10** Summarize the information on different high-level computer languages by completing the table below.

Language	Developed	Function	Characteristic

**Task 11** Listen to the recording about computer languages and then decide whether the statements below are True (T) or False (F).

1. Programming language is a formal language designed to communicate instruction to a computer. ✓
2. Machine language is a common type of high-level language. It is directly understood by the computer and does not need to be translated. ✗
3. Assembly language is readable by humans. It consists of symbols and letters. ✓
4. Two types of low-level languages are machine language and assembly language. ✓
5. Machine language is composed of ones and zeros so only computer hardware can understand it more easily than humans. ✓
6. Assembly language is also called an assembler. ✓

[Type here]

7. To understand assembly language, computer hardware needs to use assembler as a translator.
8. Low-level languages are similar to English language.
9. It's easy for programmers using high-level languages to write application programs.
10. Fortran, Java and Python are examples of low-level languages.
11. High-level languages are much closer to natural languages using a set of rules that dictate how words together form a program.
12. An interpreter is a program that translate a program written in a high-level language to the machine language of a computer.
13. A compiler is a program that simulates a computer to understand a high-level language.
14. C and its derivative C++ are compilers.
15. Fortran is an example of interpreters.

## UNIT 4

### OPERATING SYSTEMS

**Task 1      Study this text title. What do you think it means?**

#### **OPERATING SYSTEMS: HIDDEN SOFTWARE**

**Task 2      Read the text to find the answers to these questions.**

1. What difference is there between applications software and operating systems?
2. What are the main functions of an operating system?
3. Why is the supervisor program the most important operating system program?
4. What is the difference between resident and non-resident programs?

When a brand new computer comes off the factory assembly line, it can do nothing. The hardware needs software to make it work. Are we talking about such as word processing or spreadsheet software? Partly. But an applications software package does not communicate directly with the hardware. Between the applications software and the hardware is a software interface – an operating system. An operating system is a set of programs that lies between applications software and the computer hardware.

The most important program in the operating system, the program that manages the operating system, is the supervisor program, most of which remains in memory and is thus referred to as resident. The supervisor controls the entire operating system and loads into memory other operating system programs (called nonresident) from disk storage only as needed.

An operating system has three main functions:

- (1) Manage the computer's resources, such as the central processing unit, memory, disk drives, and printers.
- (2) Establish a user interface, and
- (3) Execute and provide services for applications software.

Keep in mind, however, that much of the work of an operating system is hidden from the user. In particular, the first listed function, managing the computer's resources, is taken care of without the user being aware the details.

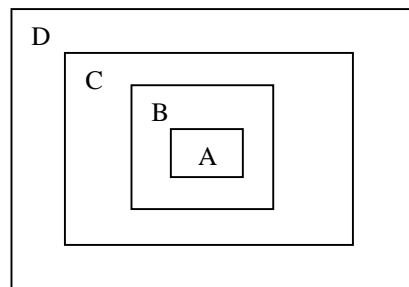
Furthermore, all input and output operations, although invoked by an applications program, are actually carried out by the operating system.

[Type here]

**Task 3** Match the labels to the four layers of this diagram with the help of the diagram caption.

1. applications program
2. user
3. hardware
4. operating system

**A conceptual diagram of an operating system**



Closest to the user are applications programs - software that helps a user compute a payroll or play a game or calculate the trajectory of a rocket. The operating system is a set of programs between the applications programs and the hardware.

**Task 4** Rewrite each of these sentences like this:

*An important function of the operating system is to manage the computer's resources.  
Managing the computer's resources is an important function of the operating system.*

1. One task of the supervisor program is to load into memory non-resident programs as required.
2. The role of the operating system is to communicate directly with the hardware.
3. One of the key functions of the operating system is to establish a user interface.
4. An additional role is to provide services for applications software.
5. Part of the work of mainframe operating systems is to support multiple programs and users.
6. The task in most cases is to facilitate interaction between a single user and a PC.
7. One of the most important functions of a computer is to process large amounts of data quickly.
8. The main reason for installing more memory is to allow the computer to process data faster.

**Task 5** Complete these sentences with the correct form of the verb:  
infinitive or -ing form.

1. Don't switch off without (close down) your PC?

[Type here]

2. I want to (upgrade) my computer.
3. He can't get used to (log on) with a password.
4. You can find information on the Internet by (use) a search engine.
5. He objected to (pay) expensive telephone calls for Internet access.
6. He tried to (hack into) the system without (know) the password.
7. You needn't learn how to (program) in HTML before (design) webpages.
8. I look forward to (input) data by voice instead of (use) a keyboard.

**Task 6      Choose the correct word to complete each sentence. You may have to change some words slightly.**

1. electron, electronic, electronics, electronically
  - a. An ..... pen is one example of an input device.
  - b. A computer solves problems .....
  - c. Many ..... students go on to work as engineers.
2. technology, technological, technologically, technologist
  - a. The computer is the greatest ..... Invention of the 20<sup>th</sup> century.
  - b. There are two ..... Involved in a clipboard PC.
  - c. Today's computers are ..... far superior to those used a few years ago.
3. identify, identifying, identifiable, identity
  - a. The clipboard's pattern recognition software immediately ..... the letters and numbers written by the stylus.
  - b. Most computer companies will not allow people without an ..... card to enter their premises.
  - c. A password is a mechanism for ..... the computer user and allowing access.
4. computer, compute, computing, computation, computerize, computerization
  - a. The ..... of the manufacturing division will be expensive in the short term, but cost-effective in the long term.
  - b. We should be able to ..... our profit for next year fairly accurately with the new program.
  - c. I could tell from all the ..... on the board that a maths lesson was in progress.

**Task 7      Here is a list of typical tasks performed by an operating systems. Fill in the blanks from the verbs: *execute, monitor, format, diagnose*. Sometimes more than one may apply.**

[Type here]

A typical operating system will:

1. .... input and output devices.
2. .... the status of hardware devices.
3. ....new disks.
4. .... disk errors.
5. .... disk commands relating to the deletion, copying, renaming of files.

## Task 8 Word - play

**Find the hidden words in this square. Some appear vertically, some horizontally, and some diagonally. They may be upside down or back to front. Use the clues below to help you. The number of letters in each word and the first letter of the word appear in brackets after the clue.**

Find words which mean:

1. a computer that is small enough to hold in the hand. (7,P)
2. an electronic pen. (6,S)
3. to erase or omit. (6,D)
4. one type of portable computer which operates with an electronic pen. (9,C)
5. the information that the computer processes. (4,D)
6. a network of lines crossing at right angles. (4,G)
7. a signal to a processor to suspend temporarily the current sequence of instructions. (9,I)
8. a pattern used as a guide for creating letters or characters. (8,T)
9. an individual dot on a computer screen. (5,P)

C	T	A	A	R	I	T	P	L	R
L	P	N	T	P	I	D	A	E	E
I	I	E	A	E	E	R	L	X	T
P	R	T	D	L	A	F	M	I	E
B	R	E	E	S	N	O	T	P	M
O	E	T	G	R	I	D	O	T	P
A	E	C	V	K	L	M	P	Y	L
R	N	D	S	T	Y	L	U	S	A
D	E	L	V	E	I	Y	S	T	T
T	P	U	R	R	E	T	N	I	E

[Type here]

**Task 9      Find sentences in the text above which are similar in meaning to the following statements.**

1. A computer program cannot be directly processed by the computer until it has been compiled.
2. An operating system is stored on disk and has to be booted into the internal memory where it must reside throughout processing.
3. An operating system is a master control program which controls the functions of the computer system as a whole and the running of application programs.