The Gen X Series

CYBER OLYMPIAD 8

Useful for Cyber Olympiads Conducted at School, National & International Levels

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Strictly According to the Latest Syllabus of Cyber Olympiad



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The Olympiad Series launched 4 years back under our GEN X SERIES Imprint gained widespread popularity amongst students and teachers immediately owing to its rich, high quality content and unique presentation. Published for Classes 1-10 across subjects English, Maths, Science & Computers, these books are holistic in nature and unlike run of the mill workbooks in the market, which are mere replicas of one another, these books deal with the content in a much comprehensive manner. Recourse to the 'Principles of Applied Psychology of Student Learning' has been utilised to upgrade levels of conceptual understanding in all designated subjects among class 1 to 10 students.

Encouraged by this huge acceptability of our Olympiad Series among parents and students and after revolutionising the way Olympiad books were written and published, we at V&S Publishers decided to take this to the next level.

We present to you Brand New Edition of our book – **CYBER OLYMPIAD CLASS 8.**

Each book originally written by Subject Matter Expert, is now further Peer Reviewed by top School Teachers and HODs to eliminate the slightest of errors that were present earlier. Furthermore to ensure authenticity and accuracy of content the book is now completely revised and reformatted as per the guidelines of the examining body. The New and Revised Olympiad Book is now suited to Olympiad examinations conducted at School Level, National Level or International Level by any and all organisations/companies.

The New Edition of this Cyber Olympiad Class 8 is written in a Guide like pattern with images and illustrations at every step & is divided into different sections. Each chapter comes with Basic Theory and Solved Examples. Multiple Choice Questions with their Answer Keys and Solutions are liberally included. In order to help students become aware of and to simulate the actual exam conditions, a bunch of OMR Sheets have been enclosed with the book as well.

Amalgamation of Technology with Content has always been at the forefront for V&S Publishers and our new Student Portal for Olympiad Practice–**www.vsexamprep.com** is further testimony to that. We recommend students logging in and using it to their benefit.

P.S. While every care has been taken to ensure correctness of content, if you come across any error, howsoever minor, anywhere in the book, do not hesitate to discuss with your teachers while pointing that out to us in no uncertain terms.

We wish you All The Best!

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SECTION 1
COMPUTERS AND IT

Hardware and Software

1

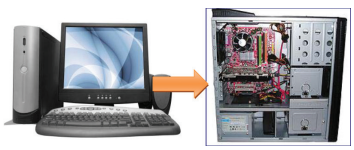
Chapter Outline:

- ❒ Key Points
- ❒ Multiple Choice Questions

Computer hardware also called just **hardware** is a collection of devices that make up the computer system. It is the physical components of a computer. Some computer hardware are, monitor, mouse, keyboard, computer data storage, hard disk drive (HDD), system unit (graphic cards, sound cards, memory, motherboard and chips). They are all physical elements that can be touched.

At the same time, software is a set of instructions that can be stored and run by the hardware component of the system. It is a set of any machine-readable instructions that a computer understands and follows to perform a task. A combination of hardware and software forms an operational computer system.

In Microsoft Windows, hardware resources are managed by Device Manager. Let us learn how all the hardware components connects together to create the complete computer system.



Components of Computer Hardware

Case

The computer case is a plastic or metal box that encloses most of the hardware components. The case contains the following hardware components. They are

- ♦ Motherboard
- ♦ Central Processing Unit
- ♦ Random Access Memory
- ♦ Power Supply
- ♦ Video Card
- ♦ Hard Drive
- ♦ Optical Drive
- ♦ Card Reader

Here are some less common computer hardware because these components are usually integrated into other devices.

- ♦ Sound Card
- ♦ Network Interface Card (NIC)

Motherboard

The motherboard is a piece of large rectangular computer hardware that can be thought of as the "back bone" of the computer system. It is also known as mainboard or logic board. The motherboard connects all of the parts of a computer together. The CPU, memory, hard drives, optical drives, video card, sound card and other ports all connect to the motherboard directly or indirectly with cables.

Motherboards vary in the types of components they support. For example, each motherboard supports a single type of CPU and a list of memory types. Popular motherboard manufacturers are ASUS, AOpen, Intel, ABIT, MSI, Gigabyte, Biostar.

The front of the motherboard contains ports to which all the internal components connect. A single socket has the CPU. Other ports on the motherboard allow the hard drive and optical devices to connect via data cables. Power from the power supply is delivered to the motherboard by use of a specially designed port.

On the left side of the motherboard are a number of ports which allow most of the computer's external peripherals to connect such as the monitor, keyboard, mouse, speakers, network cable and

more. All modern motherboards also include USB ports. Components directly attached to or part of the motherboard are

- The **CPU** (Central Processing Unit) enables a computer to function and is sometimes referred to as the brain of the computer. It is usually cooled by a heat sink and fan.
- The **Chipset** mediates communication between the CPU and the other components of the system, including the main memory.
- The **Random-Access Memory** (RAM) stores data that are actively accessed by the CPU.
- The **Read-Only Memory** (ROM) stores the BIOS that run when the computer is powered on or otherwise begins execution, a process known as booting.
- The **CMOS battery** is also attached to the motherboard. This battery is the same as a watch battery. Most batteries are CR2032, which powers the memory for date and time in the BIOS chip.

CPU

The Central Processing Unit executes most of the commands from the computer's hardware and software. The CPU is the "brain" of the computer. The CPU is also known as processor, computer processor, microprocessor, central processor. Popular CPU manufacturers are Intel and AMD. A modern CPU is small and square with many short, metallic connectors on its underside. After running even a short while, modern CPUs can get very hot. To help dissipate this heat, it is necessary to attach a heat sink and a fan directly on top of the CPU.

RAM

Random Access Memory (RAM) allows a computer to work with more information at the same time which can have a significant effect on the total system performance. RAM is also known as primary storage memory stick or RAM stick. Kingston, Crucial Technology, Corsair are popular manufacturers of RAM.



RAM

Power Supply

The power supply unit is mounted just inside the back of the case. The power supply (PSU) converts alternating current (AC) to low-voltage DC power for the internal components of the computer. Laptops are capable of running from a built-in battery, normally for a period of hours. The power supply is also known as power pack, and power converter. CoolMax, Ultra, are popular manufacturers of Power Supply.

Most power supply units are preinstalled in computer cases. Power supply units are rated by wattage to show how much power they can provide to the computer.



Power supply

Video Card

A video card is a piece of computer hardware, rectangular in shape with many contacts on the bottom of the card that allows the computer to send graphical information to a video display device such as a monitor, TV, or projector. It is also known as the graphics card and graphics adapter. Many modern computers have GPUs integrated directly onto the motherboard. This allows for a less expensive computer but also for a less powerful graphics system. Popular Video Card manufacturers are NVIDIA Corporation, AMD, Matrox. Some video cards have only one port for connection to a standard monitor or projector while more advanced cards may have ports for connections to multiple output sources including additional monitors and televisions.



Video Card

Hard Disk

The hard disk drive is the main, and usually largest, data storage hardware device in a computer. The operating system, software files and most other files are stored in the hard disk drive. The Hard Disk Drive is also known as the HDD (abbreviation), hard drive, hard disk, fixed drive, fixed disk, fixed disk drive. The hard drive is sometimes referred to as the "C drive" due to the fact that Microsoft Windows designates the "C" drive letter to the primary partition on the primary hard drive in a computer by default. Popular Hard Disk Drive manufacturers are Seagate, Western Digital, Hitachi. A hard drive is usually the size of a paperback.

The sides of the hard drive have pre drilled, threaded holes for easy mounting in the 3.5 inch drive bay in the computer case. Mounting is also possible in a larger 5.25 inch drive bay with an adapter. The hard drive is mounted so the end with the connections faces inside the computer.

Some common things you might do that involve a hard disk drive are:

- Testing a Hard Drive
- Replacing a Hard Drive
- Formatting a Hard Drive
- Partitioning a Hard Drive



Hard Disk

Optical Disk

Optical drives retrieve and/or store data on optical discs like CDs, DVDs which hold much more information than the floppy disk. The Optical Disc Drive is also known as optical drive, ODD (abbreviation), CD drive, DVD drive, BD drive, disc drive. Most optical drives can play and record onto a large number of different disc formats. Popular optical drive formats include CD-ROM, CD-R, CD-RW, DVD, DVD-RAM, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-R DL, DVD+R DL, BD-R, BD-R DL & TL, BD-RE, BD-RE DL & TL, and BDXL. Popular Optical Disc Drive manufacturers are LG, Memorex, NEC. The front of the drive has a small Open/ Close button that ejects and retracts the drive bay door. The back end of the optical drive contains a port for a cable that connects to the motherboard. External optical drives usually connect via USB.



Optical Disk

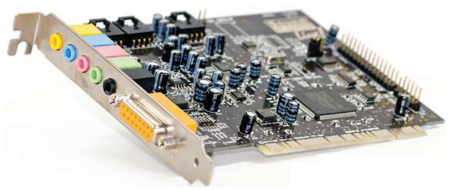
Sound Card

It is also known as sound board or audio card. A sound card provides a computer with the ability to produce sound that can be perceived by the user through a peripheral device like speakers or headphones.

Uses of a computer sound card

- Games
- Audio CDs and listening to music
- Watch movies
- Audio conferencing
- Creating and playing Midi
- Educational software
- Business presentations
- Record dictations
- Voice recognition

Computer Sound Blaster sound card



Sound Card

Network Interface Card

Network Interface Card or NIC is also an Ethernet card and network adapter. It is an expnsion card that connects a computer to a network; such as a home network, or the Internet using an Ethernet

cable with an RJ-45 connector. Most new computers have a network interface build directly into the motherboard.

Software

Without your Internet browser software you would be unable to surf the Internet or without a software operating system the browser would not be able to run on your computer. Software can also be downloaded to a computer over the Internet. Once downloaded, setup files are run to start the installation of the program on your computer.

There are free software programs available that are put into different categories.

- Shareware or trial software gives you a few days to try the software before you buy the program. After the trial time expires you have to register the product before you can continue using it.
- Freeware never requires payment, as long as it's not modified.
- Open source software allows anyone to modify the program or view how it was created.

How is Software Created?

A computer programmer or several computer programmers write the instructions using a programming language that tell the software how to work. Once the program has been completed it is compiled into a language that the computer can understand.

Examples of Software

Below is a list of the different varieties of software that a computer may have installed with examples.

Program	Software
Antivirus	AVG
Audio / Music program	iTunes
Database	Access
Device drivers	Computer drivers
E-mail	Outlook
Game	World of Warcraft
Internet browser	Firefox
Movie player	VLC
Operating system	Windows XP
Photo/Graphics program	CorelDRAW
Presentation	PowerPoint
Programming language	Perl
Simulation	Flight simulator
Spreadsheet	Excel
Utility	Compression, Disk Cleanup, Encryption, Registry cleaner, and Screensaver
Word processor	Word

How to Install a Software Program

The installation process for software depends on your operating system and the program you are installing.

General Tips

- Make sure your computer meets the system requirements of the program you are attempting to install.
- When installing a program, it is always a good idea first to close or disable any other programs that are running.
- After installing a new program if it prompts you to reboot the computer, do it.

Microsoft Windows Users

Autorun from a CD or DVD

Many software programs have an AutoPlay feature. This feature automatically starts a setup screen for the software program while inserting a CD or DVD. If your program contains this feature, follow the steps that appear after inserting the disc.

No Autorun Feature

- Open My Computer.
- Within the My Computer window, open the drive that contains the installation files
- Locate either the executable setup or install file. Double click on this file to start the installation process.

An alternate method for starting installation in Microsoft Windows

- Click Start and Run.
- In the Run Window, type x:\setup or x:\install where x is the letter of the install drive.

Installing from a Download

If the file you downloaded is an executable, click the icon twice to start the setup process.

Double click the setup to install.

MS-DOS Users

1. Before installing a program in MS-DOS, you must switch to the drive or directory that contains the installation files. If you are installing a program from a CD switch to that drive. If the installation files are located in a different directory, use the dir command to list the directories and the cd command to switch into the appropriate directory.
2. Once you are in the directory or drive that contains the installation files, run the executable for setup.

Multiple Choice Questions

1. HDD stands for
   (a) Hard drive disk
   (b) Heavy disk drive
   (c) Hard Disk Drive
   (d) Halt disk drive
2. In Microsoft Windows, hardware resources are managed by
   (a) Device supervisor
   (b) Device cleaner
   (c) Device manager
   (d) Manager
3. AVG is
   (a) Movie player
   (b) Antivirus
   (c) Device driver
   (d) Word processor
4. It is an Ethernet card and a network adaptor.
   (a) HDD (b) NIC
   (c) AMD (d) DVD
5. It is usually the largest data storage device in a computer.
   (a) DVD (b) Hard disk
   (c) CD (d) Pen drive
6. It is also called the logic board.
   (a) Sound card (b) Optical drive
   (c) Motherboard (d) Video card
7. The motherboard also has
   (a) Sound card (b) DVD
   (c) CD (d) Floppy Disk
8. It mediates communication between the CPU and the other components of the system, including the main memory.
   (a) ROM (b) RAM
   (c) Sound card (d) Chipset
9. Popular manufacturer of the motherboard is
   (a) Seagate (a) Western Digital
   (c) Hitachi (d) ABIT
10. The CMOS battery is same as the
    (a) Mobile battery
    (b) Car battery
    (c) Watch battery
    (d) Torch battery
11. It is also called the brain of the computer.
    (a) RAM (b) ROM
    (c) Power supply (d) CPU
12. To dissipate the heat, CPU is connected to the
    (a) Power supply
    (b) Motherboard
    (c) Heat sink and fan
    (d) Sound card
13. It is also called primary memory.
    (a) CD (b) DVD
    (c) ROM (d) RAM
14. It converts alternating current (AC) to low-voltage DC power for the internal components of the computer.
    (a) Optical drive
    (b) Hard disk
    (c) Sound card
    (d) Power supply
15. Power supply are rated by
    (a) Voltage (b) Ampere
    (c) Wattage (d) Joules
16. It allows the computer to send graphical information to a video display device such as a monitor, TV, or projector.
    (a) Graphic card
    (b) Sound card
    (c) NIC
    (d) DVD
17. The hard disk drive is usually referred to as the
    (a) D drive (b) A drive
    (c) B drive (d) C drive
18. It connects a computer to a network; such as a home network, or the Internet using an Ethernet cable with an RJ-45 connector.
    (a) Sound card (b) Video card
    (c) NIC (d) Graphic card
19. It gives you a few days to try the software before you buy the program.
    (a) Freeware
    (b) Hardware
    (c) Open source software
    (d) Shareware

20. Before installing a program in MS-DOS,
    (a) Switch directory that contains the installation files.
    (b) Restart the computer
    (c) Reboot the computer
    (d) Save all the files
21. The person who creates the software
    (a) Programmer (b) Designer
    (c) Builder (d) Technician
22. Firefox is a
    (a) Movie player
    (b) Antivirus
    (c) Internet browser
    (d) Word processor
23. Sound card helps you
    (a) Listen to audio files
    (b) Store data
    (c) Run the program
    (d) Destroy the virus
24. Popular Optical Disc Drive manufacturers are
    (a) LG (b) Memorex
    (c) NEC (d) All of these
25. The hardware needs it to perform tasks
    (a) Video card
    (b) Sound card
    (c) Software
    (d) Optical disk drive



Input, Output and Storage Devices

2

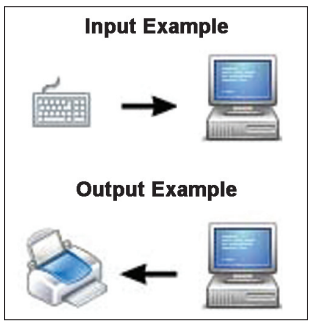
Chapter Outline:

- ❒ Key Points
- ❒ Multiple Choice Questions

Any information or data entered or sent to the computer for processing is considered input and anything that is outcome from the computer is output. Therefore, an input device such as a computer keyboard is capable of sending information to the computer, but it does not display (output) any information. An output device such as a computer printer can print information from the computer but it does not send any information (input) to the computer.

Input and Output Devices

The devices which are used to input the data and the programs in the computer are known as '**Input Devices**'. or Input device can read data and convert them to a form that a computer can understand. **Output Device** can produce the final product which can be used by humans. It provides man-to-machine communication. Some of the I/O devices are explained below:



Input Devices

(i) Keyboard: Keyboard is used in the input phase of a computer-based information system. It is most common input device is used today. The data and instructions are input by typing on the keyboard. The message typed on the keyboard reaches the memory unit of a computer. It is connected to a computer through a cable. Apart from alphabet and numeral keys, it has other function keys for performing different functions.



Keyboard

(ii) Mouse: It is a pointing device. The mouse is rolled over the mouse pad, which in turn controls the movement of the cursor in the screen. We can click, double click or drag the mouse. Most of the mouses have a ball beneath them, which rotates when the mouse in moved. The ball has 2 wheels on the sides, which in turn moves with the movement of the ball. The sensor notifies the speed of its movements to the computer, which in turn moves the cursor or pointer on the screen.



Mouse

(iii) Scanner: Scanners are used to enter information directly into one word the computer memory. This device works like a Xerox machine. The scanner converts any type