

COMPETENCY-BASED LEARNING MATERIALS



Sector:

INFORMATION AND COMMUNICATION TECHNOLOGY

Qualification:

COMPUTER HARDWARE SERVICING NC II

Unit of Competency:

INSTALL COMPUTER SYSTEMS AND NETWORKS

Module Title:

INSTALLING COMPUTER SYSTEMS AND NETWORKS



Technical Education and Skills Development Authority

**SOUTHERN ISABELA COLLEGE OF ARTS AND TRADES
Santiago City**

TECHNICAL TERMS

- **Active Hubs** – amplify or boost signals
- **Anti-Static** – A product that prevents the build up of static electricity
- **BIOS** – Basic Input/Output System, chip that controls the most basic functions of the computer and performs a self-test every time you turn it on.
- **Flash drive**– RAM that can retain data without electrical power. It is widely used for BIOS chips and for digital camera and digital music storage.
- **Graphic tablet** – objects are drawn using a pen or a puck. The puck is technically a tablet cursor, not a mouse.
- **Goggles** – A large spectacles, with shields around the rims, for protecting the eyes from dust, excessive light, wind, etc.
- **Hard-disk drive** – is a storage device that stores billions of characters of data on a nonremovable disk.
- **Hardware**- refers to the tangible (things you can touch) components of a computer system. Hardware components are further divided into three groups namely
- **Host** – any computer whether mainframe, server, or even PC that acts as an information source on a network.
- **Intelligent Hubs** – select which path a specific signal will travel
- **Joy Stick** - a hand-held control stick that allows a player to control the movements of a cursor on a computer screen or a symbol in a video game .
- **LAN Card** – Local area network interface card.
- **Laptop computer** - A small, portable computer -- small enough that it can sit on your lap.
- **Local Area Network**- the smallest of the three network types, consist of PCs connected together within a limited area, such as within the same building, floor or department.
- **Mainframe**: A powerful multi-user computer capable of supporting many hundreds or thousands of users simultaneously.
- **Metropolitan Area Network** – are network that spans no more than 50 miles. It is design to connect LANs spanning a town or city
- **Minicomputer**: A multi-user computer capable of supporting up to hundreds of users simultaneously.
- **Metropolitan Area Network** – is a network that spans no more than 50 miles. It is design to connect LANs spanning a town or city
- **Motherboard** – contains the CPU, BIOS, Memory, mass storage interfaces, serial and parallel ports, expansion slot and all the controllers required to control standard peripheral devices such as the display screen, keyboard and disk drive

- **Modem - (Modulator-Demodulator)** The modem is a device that allows a given computer to share data or otherwise a device which let computers exchange information
- **Modular Hubs** – are popular in networks because they are easily expanded and always have management option. It is purchased as chassis, or card cage, with multiple card slots, each of which accepts a communication card, or module
- **Multimedia** - is the combination of different types of communication media (sound, print, video, and so on)
- **Multitester-** is an instrument use to measure voltage, current and resistance.
- **NIC** – Network Interface Card – The PC expansion board that plug into a personal computer or server and works with the network operating system to control the flow of information over the network.
- **Network** – is a communications system connecting two or more computers.
- **Network Bridge** – divides network into smaller, more manageable sections helping reduce network traffic.
- **Network Hub** - a hardware device that all PCs on a network are connected to by cabling. The hub manages receiving and transmitting data from networked services.
- **Network Server**- is a powerful computer whose sole purpose is to serve network clients.
- **Network Switch** – It helps determine how data moves over large networks.
- **Notebook computer** An extremely lightweight personal computer that weighs weigh less than 6 pounds and are small enough to fit easily in a briefcase.
- **OHS** – Occupational Health and Safety
- **Operating System (Os)** -software that controls the allocation and use of programs and data that a computer uses.
- **Passive Hubs** – simply connects various cables
- **Personal computer:** A small, single-user computer based on a microprocessor.
- **Port hub /Port** – is a connector on the back of a computer or other device. A port is either a serial port or a parallel port.
- **Peers-** mean any computer sharing the same protocol layer with another computer.
- **Protocol** – refers to the specific standards governing the sending and receiving of data.
- **Repeater-** a device that strengthen signals and allow then to stay clear over longer distances.
- **Printer** - It is a piece of hardware that produces a paper copy (also known as 'hardcopy') of the information generated by the computer.
- **RAM** – Random Access Memory, is a primary memory. This memory is used inside the computer to hold programs and data while it is running.
- **RJ 45** – is the connector plugged into the NIC ports on computers and often connecting the main networking hardware together.

- **Router** – a device that forwards data packets between Local or Wide Area Network groups.
- **Scanner**- it is an input device that read text or illustration printed on paper,

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translates the information into a form that a computer can use.

- **Server** – is a part of a network. It is a special computer that users on the network can access to carry out a particular job.
- **Software** – programs and data that a computer uses.
- **Software applications**- enables you to perform specific tasks- solve problems, perform work, or entertain yourself.
- **Sound Device Driver Installer / Sound and Audio Devices** – A windows XP Control Panel applet, called Sounds, and Multimedia in Windows 2000, for configuring the system's sound card.
- **Stackable Hubs** – work just like standalone hubs, except that several of them can be “stacked” (connected) together, usually by short lengths of cable.
- **Standalone Hubs** – are single products with a number of ports. It usually includes some method of linking them to other standalone hubs for network expansion.
- **Static** – The discharge of electricity between two objects with different electrical potential
- **Sub notebook computer** - A portable computer that is slightly lighter and smaller than a full-sized notebook computer. Typically, sub notebook computers have a smaller keyboard and screen, but are otherwise equivalent to notebook computers.
- **UTP** – (Unshielded Twisted Pair) least expensive and most popular network media.
- **USB** – Universal Serial Bus, a hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, scanner, printer and telephony devices.
- **Video Camera** - camera using videotape: a camera that records onto videotape
- **Wide Area Network** – used to distribute information thousand of miles among thousands of users.
- **Wireless Hubs**– are hubs designed for the home
- **Workstation**- is any network computer that connects to and request resources from a network

INFORMATION SHEET 1.1-1

OHS Policies and Procedures

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to identify and apply OHS policies and procedures in Computer Hardware Servicing.

Occupational Health and Safety Policy

Occupational health and safety is a [cross-disciplinary](#) area concerned with protecting the [safety](#), [health](#) and [welfare](#) of people engaged in work. The goal of all occupational health and safety programs is to foster a safe work environment. As a secondary effect, it may also protect co-workers, family members, employers, customers, suppliers, nearby communities, and other members of the public who are impacted by the workplace environment. It may involve interactions among many subject areas, including [occupational medicine](#), [occupational \(or industrial\) hygiene](#), [public health](#), [safety engineering](#), [chemistry](#), [health physics](#).

Safety practices should be learned early and always adhered to when working with any electrical device, including personal computers and peripherals. This is for the protection of not only the people working with them, but also for the devices themselves. The basis for this process begins with your Occupational Health and Safety Policies.

Personal Safety While Working Along With PC's

While working inside your computer, do not attempt to service the computer except as explained in this guide and elsewhere in product documentation. Always follow the instructions closely.

Computer equipment can be dangerous, and you or others can be injured or even killed if you don't follow proper safety guidelines when working along PC's. The following are some precautionary measures to take before working with any computer equipment:

Before you start to work on the computer, perform the following steps in the sequence indicated:

1. *Turn off* the computer and all peripherals.
2. *Touch* an unpainted metal surface on the computer chassis, such as the metal around the card-slot openings at the back of your computer, before touching anything inside your computer.
3. *Disconnect* the computer and peripherals from their electrical outlets. Doing so reduces the potential for personal injury or shock. Also disconnect any telephone or telecommunication lines from the computer.

 *NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power light-emitting diode (LED) on the system board has turned off.*

While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might harm internal components.

In addition, it is recommended that you periodically review the safety instructions in your *System Information Guide*.

Additional Safety tips:

- Wear shoes with non-conductive rubber soles to help reduce the chance of being shocked or seriously injured in an electrical accident.
- Do not work on components that are plugged into their power source.
- Do not remove expansion cards from a computer when it is turned on.
- Remove all jewelry when working inside any computer related equipment.
- Be sure not to mix electronic components and water.
- When you shut down your computer, be sure to shut it down properly. Do not turn it off with the case switch.
- Don't eat or drink while working.

Self Check 1.1.1

Directions:

Identify at least 10 Occupation health and Safety (OHS) policies and procedures in CHS.

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10.		
Did the Trainee overall performance meet the required evidence/standard?	<input type="checkbox"/>	<input type="checkbox"/>
	Yes	No

ANSWER KEY 1.1-1

10 Occupation health and Safety (OHS) policies and procedures in CHS.

- | |
|---|
| 1. <i>Disconnect</i> the computer and peripherals from their electrical outlets. |
| 2. <i>Touch</i> an unpainted metal surface on the computer chassis, such as the metal around the card-slot openings at the back of your computer, before touching anything inside your computer |
| 3. <i>Turn off</i> the computer and all peripherals |
| 4. Wear shoes with non-conductive rubber soles to help reduce the chance of being shocked or seriously injured in an electrical accident. |
| 5. Do not work on components that are plugged into their power source. |
| 6. Do not remove expansion cards from a computer when it is turned on. |
| 7. Remove all jewelry when working inside any computer related equipment. |
| 8. Be sure not to mix electronic components and water. |
| 9. When you shut down your computer, be sure to shut it down properly. Do not turn it off with the case switch. |
| 10. Wear anti static materials. |

INFORMATION SHEET 1.1-2

Basic Terms, Concepts, Functions and Characteristics Of PC Hardware Components

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to identify the Basic Terms, Concepts, Functions and Characteristics of PC Hardware Components

Types of Computer



Workstation

A workstation is a high-end personal computer designed for technical or scientific applications. Intended primarily to be used by one person at a time, they are commonly connected to a local area network and run multi-user operating systems.



Desktop computer

Desktop computers come in a variety of styles ranging from large vertical tower cases to small form factor models that can be tucked behind an LCD monitor. In this sense, the term 'desktop' refers specifically to a horizontally-oriented case, usually intended to have the display screen placed on top to save space on the desk top. Most modern desktop computers have separate screens and keyboards.

Single unit

Single unit PCs (also known as all-in-one PCs) are a subtype of desktop computers, which combine the monitor and case of the computer within a single unit.

Nettop

A subtype of desktops, called nettops, was introduced by Intel in February 2008 to describe low-cost, lean-function, desktop computers.

Laptop

A laptop computer or simply laptop, also called a notebook computer or sometimes a notebook, is a small personal computer designed for portability.



Netbook



Netbooks (also called mini notebooks or subnotebooks) are a rapidly evolving category of small, light and inexpensive laptop computers suited for general computing and accessing web-based applications; they are often marketed as "companion devices," that is, to augment a user's other computer access.

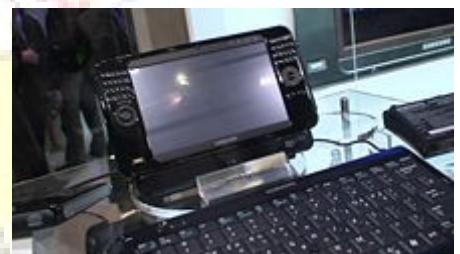
Tablet PC

A tablet PC is a notebook or slate-shaped mobile computer, first introduced by Pen computing in the early 90s with their PenGo Tablet Computer and popularized by Microsoft. Its touchscreen or graphics tablet/screen hybrid technology allows the user to operate the computer with a stylus or digital pen, or a fingertip, instead of a keyboard or mouse.



Ultra-Mobile PC

The ultra-mobile PC (UMPC) is a specification for a small form factor of tablet PCs. It was developed as a joint development exercise by Microsoft, Intel, and Samsung, among others. Current UMPCs typically feature the Windows XP, Windows Vista, Windows 7, or Linux operating system and low-voltage Intel Atom or VIA C7-M processors.

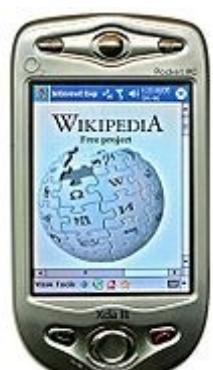


Home theater PC

A home theater PC (HTPC) is a convergence device that combines the functions of a personal computer and a digital video recorder. It is connected to a television or a television-sized computer display and is often used as a digital photo, music, video player, TV receiver and digital video recorder.

Pocket PC

A pocket PC is a hardware specification for a handheld-sized computer (personal digital assistant) that runs the Microsoft Windows Mobile operating system. It may have the capability to run an alternative operating system like NetBSD or Linux. It has many of the capabilities of modern desktop PCs.



HARDWARE



An exploded view of a modern personal computer and peripherals:

1. Scanner
2. CPU (Microprocessor)
3. Primary storage (RAM)
4. Expansion cards (graphics cards, etc.)
5. Power supply
6. Optical disc drive
7. Secondary storage (Hard disk)
8. Motherboard
9. Speakers
10. Monitor
11. System software
12. Application software
13. Keyboard
14. Mouse
15. External hard disk
16. Printer

Computer case

A computer case is the enclosure that contains the main components of a computer. Cases are usually constructed from steel or aluminium, although other materials such as wood and plastic have been used. Cases can come in many different sizes, or form factors.

Processor



The central processing unit, or CPU, is that part of a computer which executes software program instructions. In older computers this circuitry was formerly on several printed circuit boards, but in PCs is a single integrated circuit. Nearly all PCs contain a type of CPU known as a microprocessor, with a fan attached via heat sink.



Motherboard

The motherboard, also referred to as systemboard or mainboard, is the primary circuit board within a personal computer.



Main memory



A PC's main memory is fast storage that is directly accessible by the CPU, and is used to store the currently executing program and immediately needed data.

Hard disk

Mass storage devices store programs and data even when the power is off; they do require power to perform read and write functions during usage. Although flash memory has dropped in cost, the prevailing form of mass storage in personal computers is still the hard disk.



Video card

The video card - otherwise called a graphics card, graphics adapter or video adapter - processes and renders the graphics output from the computer to the computer display, and is an essential part of the modern computer.



Visual display unit

A visual display unit (or monitor) is a piece of electrical equipment, usually separate from the computer case, which displays viewable images generated by a computer without producing a permanent record.



Keyboard



In computing, a keyboard is an arrangement of buttons that each correspond to a function, letter, or number. They are the primary devices of inputting text.

Mouse



A Mouse on a computer is a small, slidable device that users hold and slide around to point at, click on, and sometimes drag objects on screen in a graphical user interface using a pointer on screen.

Other components

Mass storage

All computers require either fixed or removable storage for their operating system, programs and user generated material.

Formerly the 5½ inch and 3½ inch floppy drive were the principal forms of removable storage for backup of user files and distribution of software.

Computer communications

- Internal modem card
- Modem
- Network adapter card
- Router

Common peripherals and adapter cards

- Headset
- Joystick
- Microphone
- Printer
- Scanner
- Sound adapter card as a separate card rather than located on the motherboard
- Speakers
- Webcam

- **LAN Card** – is a network interface card. computer circuit board or card that is computer so that it can be connected to a computer network.
- **Modem - (Modulator-Demodulator)** is a device that allows a given computer or otherwise a device which let computers information exchange
- **USB** – Universal Serial Bus, a hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, scanner, printer and telephony devices.
- **Scanner**- it is an input device that read text or illustration printed on paper, translates the information into a form that a computer can use.

- **Printer** - it is a piece of hardware that produces a paper copy (also known as 'hardcopy') of the information generated by the computer.



This is a **Modem** installed in a computer to share data exchange



- **RAM** – Random Access Memory, is a primary memory. This memory is used inside the computer to hold programs and data while it is running.
- **BIOS** – Basic Input/Output System, chip that controls the most basic functions of the computer and performs a self-test every time you turn it on.
- **Flash drive**– RAM that can retain data without electrical power. It is widely used for BIOS chips and for digital camera and digital music storage.



- **Video Camera** - camera using videotape: a camera that records onto videotape



Self Check 1.1-2

Multiple Choice

Direction: Choose the best answer of the given choices. Use a separate sheet of paper in answering.

1. It is a high end personal computer designed for technical or scientific applications. Intended primarily to be used by one person at a time, they are commonly connected to a local area network and run multi-user operating systems.
A. Work Station
B. Nettop
C. Laptop
D. Tablet PC
2. It is a small personal computer designed for portability. Usually all of the interface hardware needed to operate this computer, such as USB ports (previously parallel and serial ports), graphics card, sound channel, etc., are built in to a single unit.
A. Work Station
B. Nettop
C. Laptop
D. Tablet PC
3. It is a convergence device that combines the functions of a personal computer and a digital video recorder.
A. Work Station
B. Home theater PC
C. Laptop
D. Tablet PC
4. It is a hardware specification for a handheld-sized computer (personal digital assistant) that runs the Microsoft Windows Mobile operating system.
A. Work Station
B. Home theater PC
C. Laptop
D. Pocket PC
5. It is also called mini notebooks or subnotebooks and are a rapidly evolving category of small, light and inexpensive laptop computers suited for general computing and accessing web-based applications
A. Netbook
B. Home theater PC
C. Work Station
D. Pocket PC
6. It is the enclosure that contains the main components of a computer.
A. Mother Board
B. Computer Case
C. Processor
D. Hard Disk
7. It is the part of a computer which executes software program instructions.
A. Mother Board
B. CPU
C. Processor
D. Hard Disk
8. It is also referred to as systemboard or mainboard, and is the primary circuit board within a personal computer.

- A. Mother Board
 - B. CPU
 - C. Processor
 - D. Hard Disk
9. It processes and renders the graphics output from the computer to the computer display.
- A. Memory
 - B. CPU
 - C. Video card
 - D. Hard Disk
10. It is a piece of electrical equipment, usually separate from the computer case, which displays viewable images generated by a computer without producing a permanent record.
- A. Memory
 - B. CPU
 - C. Printer
 - D. Monitor

B. Identification

Directions: Identify the following computer components

Use a separate sheet of paper in answering.

1.



2.



3.



4.



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6.



7.



8.



9.



10.



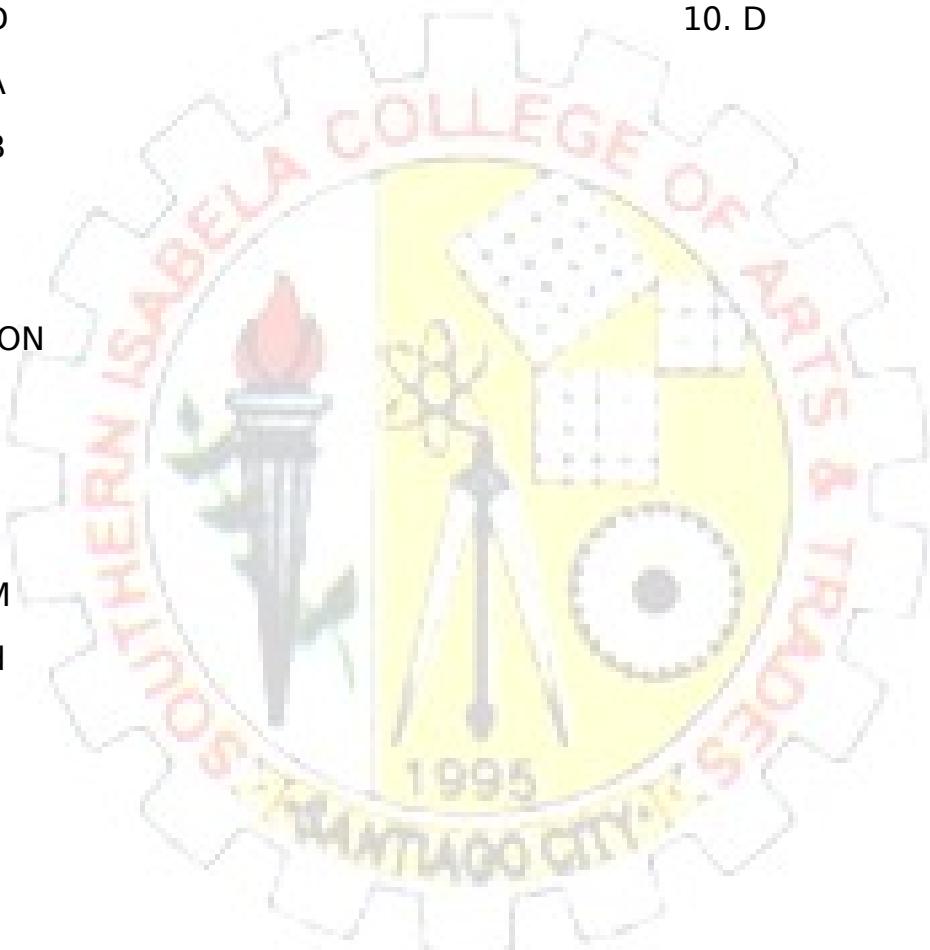
ANSWER KEY 1.1-2

A. MULTIPLE CHOICE

- | | |
|------|-------|
| 1. A | 7. B |
| 2. C | 8. A |
| 3. B | 9. C |
| 4. D | 10. D |
| 5. A | |
| 6. B | |

IDENTIFICATION

- Monitor
- Video card
- Hard Disk
- Memory/ RAM
- Mother Board
- Processor
- Keyboard
- Mouse
- Printer
- 10. Scanner



INFORMATION SHEET 1.1-3

Structure of Operating System

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to be familiar with the structure of Operating System.

SOFTWARE



A screenshot of the OpenOffice.org Writer software

Computer software is a general term used to describe a collection of computer programs, procedures and documentation that perform some tasks on a computer system.^[29] 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 which controls and co-ordinates distributed systems.

Operating system

An operating system (OS) manages computer resources and provides programmers with an interface used to access those resources.

Microsoft Windows



Windows 7, the latest client version in the Microsoft Windows line

Microsoft Windows is the collective brand name of several software operating systems by Microsoft. Microsoft first introduced an operating environment named *Windows* in November 1985 as an add-on to MS-DOS in response to the growing interest in graphical user interfaces (GUIs).^{[31][32][not in citation given]} The most recent client version of Windows is Windows 7 and Windows Server 2008 R2 which was available at retail on October 22, 2009.

Mac OS X



Mac OS X Snow Leopard desktop

Mac OS X is a line of graphical operating systems developed, marketed, and sold by Apple Inc.. Mac OS X is the successor to the original Mac OS, which had been Apple's primary operating system since 1984. Unlike its predecessors, Mac OS X is a Unix-based graphical operating system.

Linux



A Linux distribution (Kubuntu) running the KDE 4 desktop environment.

Linux is a family of Unix-like computer operating systems. Linux is one of the most prominent examples of free software and open source development: typically all underlying source code can be freely modified, used, and redistributed by anyone.^[33] The name "Linux" comes from the Linux kernel, started in 1991 by Linus Torvalds.

Applications



GIMP raster graphics editor

A computer user will apply application software to carry out a specific task. System software supports applications and provides common services such as memory management, network connectivity, or device drivers; all of which may be used by applications but which are not directly of interest to the end user.

- **Software applications**

Software - is the programs and data that a computer uses.

- **Network OS Software**

Network-are multiple computers linked together to make simultaneous information sharing and exchange by multiple users.

- **Sound Device Driver Installer / Sound and Audio Devices** – A windows XP Control Panel applet, called Sounds, and Multimedia in Windows 2000, for configuring the system's sound card.

SELF CHECK 1.1-3

A. Multiple Choice

Direction: Choose the best answer of the given choices. Use a separate sheet of paper in answering.

1. It is a general term used to describe a collection of computer programs, procedures and documentation that perform some tasks on a computer system.
A. Hardware
B. Software
C. Utility
D. Application
2. It manages computer resources and provides programmers with an interface used to access those resources.
A. Operating System
B. Software
C. Utility
D. Application
3. It is one of the most prominent examples of free software and open source development operating system.
A. Linux
B. Software
C. Utility
D. Application
4. It is a line of graphical operating systems developed, marketed, and sold by Apple Inc..
A. Linux
B. Mac OS X
C. Windows
D. Application
5. It is the collective brand name of several software operating systems by Microsoft.
A. Linux
B. Mac OS X
C. Windows
D. Application

ANSWER KEY 1.1-3

1. B

2. A
3. A
4. B
5. C

INFORMATION SHEET 1.1-4

System Configuration / Settings of computer system and devices

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to be familiar with System Configuration / Settings of computer system and devices.

System Configuration

System Configuration Utility overview

The System Configuration utility automates the routine troubleshooting steps that Microsoft Customer Support Services professionals use when they diagnose system configuration issues. When you use this utility to modify the system configuration, you can select check boxes to eliminate issues that do not apply to your configuration. This process reduces the risk of typing errors that you may make when you use any text editor, such as Notepad. You must be logged on as an administrator or as a member of the Administrators group to use the System Configuration utility.

When you use the System Configuration utility, you can easily reset or change the configuration settings in Windows to include preferences for the following files and settings:

- The System.ini file
- The Win.ini file
- The Boot.ini file
- Programs that are set to load during the startup process (these programs are specified in the Startup folder and in the registry)
- Environment settings
- International settings

There are two methods for troubleshooting configuration issues by using the System Configuration utility. Read each method carefully to understand the consequences of each method.

Method 1: Diagnostic and Selection startup modes

Diagnostic startup

Diagnostic startup enables Windows to determine the basic device drivers and software to load when you start Windows. When you use this method, the system temporarily disables Microsoft services such as Networking, Plug and Play, Event Logging, and Error Reporting. Also, you permanently delete all restore points for the System Restore utility.

Note Do not use this method if you want to save your restore points for System Restore

or if you must use a Microsoft service to test a problem.

To perform a diagnostic startup, follow these steps:

1. Click **Start**, click **Run**, type **msconfig**, and then click **OK**.
2. On the **General** tab, click **Diagnostic Startup**, and then click **OK**.
3. Restart your computer.

If the problem does not occur, use Selective startup mode to try to find the problem by turning individual services and startup programs on or off.

Selective startup

Selective startup enables you to select the files and the settings that you want the computer to load when you restart the computer. Select from the following options:

- Process System.ini File
- Process Win.ini file
- Load System Services
- Load Startup Items

By default, no options are selected. The following actions apply to these options:

- When you select the check box, the configuration file is processed when you restart the computer.
- When you clear the check box, the configuration file is not processed when you restart the computer.
- When the check box is selected, and you cannot select the check box because it appears dimmed, some items are still loading from that configuration file when you restart the computer.
- When the check box is not selected, and you cannot select the check box because it appears dimmed, the configuration file is not present on the computer.
- You cannot change the **Use Original BOOT.INI** option button.

Note When you clear the **Load System Services** check box, you disable Microsoft services such as Networking, Plug and Play, Event Logging, and Error Reporting. You also permanently delete all restore points for the System Restore utility. Do not clear this check box if you want to keep your restore points for System Restore, or if you have to use a Microsoft service to test a problem.

To perform a selective startup, follow these steps:

1. Click **Start**, click **Run**, type **msconfig**, and then click **OK**.
2. On the **General** tab, click **Selective Startup**.
3. Select or clear the available settings.
4. Click **OK**.
5. Restart your computer.
6. Repeat steps 1 through 5 until you find the problem.

Change individual file settings

If you know the different settings in each configuration file, you can enable or disable individual settings in the file that has the tab for that file in the System Configuration utility. To prevent individual items in a configuration file from loading when you restart your computer, follow these steps:

1. Click **Start**, click **Run**, type **msconfig**, and then click **OK**.
2. Click a tab: **System.ini**, **Win.ini**, **Boot.ini**, **Services**, or **Startup**.
3. Select or clear the available settings.
4. Click **OK**.
5. Restart your computer.
6. Repeat steps 1 through 5 until you find the problem.

System.ini and Win.ini options

The **SYSTEM.INI** and **WIN.INI** tabs in the System Configuration utility have the following options:

- Check boxes enable you to enable or to disable an option. To enable an option so that it loads at startup, select the check box or select the option, and then click the **Select** button. To disable an option so that it does not load at startup, clear the check box or select the option, and then click the **Disable** button.
- **Move Up** and **Move Down** buttons enable you to move through the different options when you do not have a mouse.
- The **New** button enables you to create a new entry in the System.ini or in the Win.ini file. Click the button, and type your entry.
- The **Edit** button enables you to edit an existing line in the System.ini or in the Win.ini file. Click the button, and edit the line.

When a check box is unavailable on the **SYSTEM.INI** and **WIN.INI** tabs, the System Configuration utility temporarily removes the lines.

Note When you click to clear a check box for an item or a line, the **Selective Startup** option on the **General** tab is automatically selected.

Manually extract a file

If you have to fix a corrupted file, extract the individual Windows file from the CAB files. To do this, follow these steps:

1. Click **Start**, click **Run**, type **msconfig**, and then click **OK**.
2. On the **General** tab, click **Expand File**.
3. In the **File to restore** box, type the name of the file that you want to restore.
4. In the **Restore from** box, type the path of the Windows XP .cab file from which you want to restore the file. Or, click **Browse From** to locate the Windows XP .cab file.

Note The Windows XP .cab files are stored in the I386 folder on the Windows XP installation CD.

5. In the **Save file in** box, type the path of the folder to which you want to extract the new file. Or, click **Browse To** to locate the folder that you want.
6. Click **Expand**.
7. In the **System Configuration Utility** dialog box, click **OK**. If you are prompted to restart the computer, click **Restart**.

Return to normal startup

After you complete your troubleshooting and fix your configuration, return to a normal startup. Follow these steps:

1. Click **Start**, click **Run**, type **msconfig**, and then click **OK**.
2. On the **General** tab, click **Normal startup**.
3. Click **OK**.
4. Restart your computer.

Method 2: System restore

You can use the System Configuration utility to perform a system restore. There are three possible restore points:

- System checkpoints that Windows schedules
- Manual restore points that you specify with the System Configuration utility
- Installation restore points that occur before you install a program or a service

You can use the system checkpoints or the installation restore points to restore your computer's settings to a date when it operated correctly. This may also help determine the cause of the configuration error.

To perform a system restore, follow these steps:

1. Click **Start**, click **Run**, type **msconfig**, and then click **OK**.

2. On the **General** tab, click **Launch System Restore**.
3. Select **Restore my computer to an earlier time**, and then click **Next**.
4. Calendar dates in bold are possible restore points. Click the most recent one to view system restore information.
5. Select a system checkpoint or an installation restore point, and then click **Next**.
6. Close all other programs.
7. To start the system restore, click **Next**.
8. Your computer restarts.
9. Repeat steps 1 through 8 until you fix your configuration issue.

Assigning Resources to Devices

Many devices have fixed resource assignments that cannot be changed. Most system devices are like this. In addition, it is generally best not to change (or try to change) the resource settings for standard devices like IDE hard disk controllers unless you both really know what you are doing and there is a compelling reason to change them. The following devices usually have hard-coded resource settings that cannot be changed: system devices, keyboard, PS/2 mouse, floppy disk controller, primary IDE controller, video card. Others can generally be changed, although it makes more sense for some devices than for others.

There are several different ways that are generally used to set or change resource settings for devices:

- **Hardware Settings:** Resource assignments on some cards, especially older ones, is done by hardware on the device itself. This involves changing the settings of jumpers and switches, usually on the circuit board of the device, to tell it what resources to use.
 - **Software Configuration Programs:** Many newer cards are configured using special software config programs that come with them.
 - **Plug and Play:** Newer devices that subscribe to the Plug and Play standards can be automatically configured under certain conditions when used in a machine that supports Plug and Play, with an operating system that supports it. Plug and Play is an attempt to eliminate the large amount of work in assigning resources to devices and resolving conflicts.
-  • **Tip:** It is always a good idea, once you have your system configured in a way that makes sense and works for you, to record the system configuration for future reference

Resource Conflicts and Conflict Resolution

As discussed in several other areas of this section, one of the major issues with system resources is configuring your system's devices so that they don't interfere with each other. When more than one device attempts to use the same resource, the result is a *resource conflict*.

The Nature of Resource Conflicts

Resource conflicts can manifest themselves in several different ways. Some conflicts can be very easy to recognize; others can be extremely difficult to find and correct, because they manifest themselves indirectly, or through symptoms that may not seem

to have anything to do with the device causing the problem. Here are some of the ways that resource conflicts manifest themselves. Some of these may be consistent and repeatable, while others may be intermittent:

- System hangs or lockups, particularly while using a peripheral device.
- (Memory) parity errors on parity-enabled systems.
- Noise or other problems from sound cards.
- Junk being printed on your printer.
- The mouse pointer hanging and refusing to move, or moving in a stuttering fashion.
- Errors and crashes of applications for no apparent reason.

As you can see, some of these obviously point to a resource problem, but many do not. For example, system crashes can be caused by many non-resource-related factors. If your mouse works until you try to use your modem, well, you can probably figure out what the problem is, or at least where to start looking. In general, if you just added a new peripheral to your PC and a resource conflict is indicated, the new device is almost certainly involved *someday*.

Resource Conflict Resolution

If you suspect a resource conflict in your PC, you of course need to resolve this conflict. This can be easy to do if you know where to start looking, or very hard if you do not. There are some general steps that can be followed to fix this sort of problem. In very brief terms the steps are:

- Determine what all the devices in the system are using for resources.
- Identify the conflicting devices.
- Change the resource settings on one or more of the devices so they are no longer conflicting.

Using the Windows XP Control Panel

The Control Panel in Windows XP is where many of administrative and configuration tools are located.



the

your
Other

versions of Windows have a Control Panel as well but we will focus on Windows XP since that is what the majority of Windows users use. To get to the Control Panel click on Start and then Control Panel or Start, Settings, Control Panel depending on what Start Menu you are using.

Now we will go over the functions of the various Control Panel icons so you can get an idea of what they are for and how you can use them to improve your Windows experience.

Accessibility Options - Here you can change settings for your keyboard, mouse, display and sound.

Add Hardware - This will open the Add Hardware Wizard which will search your computer for new hardware that you have installed when Windows does not recognize it on its own.

Add or Remove Programs - If you need to install or uninstall any software on your computer, this is where you will do it. You should always uninstall software rather than delete it from your hard drive.

Administrative Tools - This section of your Control Panel is used for administrative functions such as managing your computer, monitoring performance, editing your security policy and administering your computer's services.

Automatic Updates - Here is where you tell Windows how and when to update itself. You can control whether or not it downloads updates automatically or at all and when you want them installed or to ask you before installing them.

Bluetooth Devices - If you are using any Bluetooth devices on your computer here is where you can add, remove and manage them.

Date and Time - This one explains itself. You can set your computer's date, time and regional settings here.

Display - The display settings allow you to change the way things appear on the screen. You can adjust items like the screen resolution and color depth. Here is where you can select your background wallpaper and setup your screensaver.

Folder Options - This is where you can adjust the way you view your files and folders from within My Computer or Windows Explorer.

Fonts - The Fonts applet allows you to add, remove and manage fonts on your computer. It will show you what fonts are installed in your system.

Game Controllers - If you use a joystick, steering wheel or any other type of game controller you can use this section to add, remove and troubleshoot the devices.

Internet Options - If you use Internet Explorer for your web browser you will go here to change settings such for history, connections and security among other things.

Keyboard - Here you can adjust settings such as how fast the keyboard will repeat a character when a key is held down and the cursor blink rate.

Mail - The Mail applet lets you adjust your properties for your Outlook or Exchange email settings.

Mouse - Here you can adjust your mouse setting for features such as double click speed, button assignment and scrolling. You can also change your mouse pointers and effects as well as view details about your mouse.

Network Connections - This item is where you can check and adjust your network connection settings. It will take you to the same place as if you were to right click My Network Places and choose properties. It will show all of your active network, dialup and wireless connections. There is also a New Connection Wizard to help you setup a new connection.

Phone and Modem Options - If you have a modem installed on your system and use it for dialup connections or faxing you can change the settings here. The Dialing Rules tab allows you to change settings for things such as dialing a number to get an outside line and setting up carrier codes for long distance and using calling cards. The Modems tab allows you to add, remove and changed the properties for installed modems. The Advanced tab is for setting up telephony providers.

Power Options - Here is where you adjust the power settings of your computer. Windows has built in power schemes for different settings such as when to turn off the monitor or hard drives and when to go into standby mode. You can even create your own schemes and save them. The advanced tab allows you to assign a password to bring the computer out of standby and tell the computer what to do when the power or sleep buttons are pressed. If you want to enable hibernation or configure an attached UPS then you can do it here as well. This area can also be accessed from the display properties settings under the Screensaver tab.

Printers and Faxes - This area is where your printers are installed and where you would go to manage their settings. It's the same area that is off of the Start menu. There is an add printer wizard which makes it easy to install new printers. To manage a printer you would simply right click it and select properties.

Regional and Language Options - If you need to have multiple languages or formats for currency, date and time you can manage them here.

Scanners and Cameras - Windows provides a central place to manage your attached scanners and camera and adjust their settings. There is even a wizard to add new devices to make the process of installing a scanner or camera easier.

Scheduled Tasks - This item provides the ability for you to schedule certain programs to run at certain times of the day. For example if you have a batch file you want to run every night you can set it up here. You can also have it run a program at any scheduled interval you choose. There is a handy wizard to help you through the process.

Security Center - The Windows Security Center checks the status of your computer for the stats of your firewall, virus protection and automatic updates. A firewall helps protect your computer by preventing unauthorized users from gaining access to it through a network or the Internet. Antivirus software can help protect your computer against viruses and other security threats. With Automatic Updates, Windows can routinely check for the latest important updates for your computer and install them automatically.

Sounds and Devices - Here is where you can adjust your sound and speaker settings. The Volume tab has settings to mute your system, have a volume icon placed in the taskbar and tell your computer what type of speakers you are using such as a 5.1 system. The sounds tab lets you adjust what sounds occur for what windows events. If you need to change what device is used for playback and recording you can do it under the Audio tab. Voice playback and recording settings are under the Voice tab. To troubleshoot your sound device you can use the Hardware tab. This is where you can get information about your particular sound device.

Speech Properties - Windows has a feature for text to speech translation where the computer will read text from documents using a computer voice that you can hear through your speakers. The type of voice and speed of the speech can be adjusted here.

System - If you have ever right clicked My Computer and selected Properties then you have used the System feature of Control Panel. This area gives you information about your computer's configuration, name and network status. You can click on the Hardware tab to view details about hardware profiles and driver signing as well as get to Device Manager. The Advanced tab lets you change settings for virtual memory (page files) and other performance settings. There is also an area to change startup and recovery settings if needed. If you want to enable remote access to your computer for Remote Desktop or Remote Assistance you can enable it here.

Taskbar and Start Menu - This is where you change the setting for your taskbar and Start menu..

User Accounts - If you need to manage your local computer users then here is where you need to go. You can add remove users and change the account types for users who log into your system.

Windows Firewall - This is the same firewall setting described in the Windows Security Center section.

Wireless Network Setup Wizard - This wizard is used to help you setup a security enabled wireless network in which all of your computer and devices connect through a wireless access point.

SELF-CHECK 1.1-4

A. Multiple Choice

Direction: Choose the best answer of the given choices. Use a separate sheet of paper in answering.

1. Starts Windows in the usual manner.
 - A. Normal Startup
 - B. Diagnostic startup
 - C. Selective startup
 - D. Safe Mode
2. Starts Windows with basic services and drivers only. This mode can help rule out basic Windows files as the problem.
 - A. Normal Startup
 - B. Diagnostic startup
 - C. Selective startup
 - D. Safe Mode
3. Starts Windows with basic services and drivers and the other services and startup programs that you select.
 - A. Normal Startup
 - B. Diagnostic startup
 - C. Selective startup
 - D. Safe Mode
4. Here you can change settings for your keyboard, mouse, display and sound.
 - A. Accessibility Options
 - B. Add or Remove Programs
 - C. Administrative Tools
 - D. Folder Options
5. You can set your computer's date, time and regional settings here.
 - A. Accessibility Options
 - B. Add or Remove Programs
 - C. Date and Time
 - D. Folder Options
6. Here is where you adjust the power settings of your computer.
 - A. Power Options
 - B. Add or Remove Programs
 - C. Date and Time
 - D. Folder Options
7. This item provides the ability for you to schedule certain programs to run at certain times of the day.
 - A. Scanners and Cameras
 - B. Add or Remove Programs
 - C. Date and Time
 - D. Scheduled Tasks
8. This area gives you information about your computer's configuration, name and network status.
 - A. System
 - B. Add or Remove Programs
 - C. Date and Time
 - D. Scheduled Tasks

9. If you need to manage your local computer users then here is where you need to go.

- A. System
- B. Add or Remove Programs
- C. User Accounts
- D. Scheduled Tasks

10. This area is where your printers are installed and where you would go to manage their settings.

- A. Printers and Faxes
- B. Add or Remove Programs
- C. User Accounts
- D. Scheduled Tasks

B. True or False

1. Many devices have fixed resource assignments that cannot be changed.
2. Disabling applications that normally run at boot time might result in related applications starting more slowly or not running as expected.
3. One key to a well-tuned, trouble-free system is making sure it is properly configured.
4. Resource assignments on some cards, especially older ones, is done by hardware on the device itself.
5. Newer devices that subscribe to the Plug and Play standards cannot be automatically configured.

ANSWER KEY 1.1-4

- | | |
|------|-------|
| 1. A | 6. A |
| 2. B | 7. D |
| 3. C | 8. A |
| 4. A | 9. C |
| 5. C | 10. A |

B. True or False

1. TRUE
2. TRUE
3. TRUE
4. TRUE
5. FALSE

INFORMATION SHEET 1.2-1

Personal Protective Equipment

LEARNING OUTCOME #2	Install Equipment, Device / System
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Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to be familiar and use the Personal Protective Equipment properly.

Personal Protective Equipment

It refers to protective clothing, helmets, goggles, or other gear designed to protect the wearer's body or clothing from injury by electrical hazards, heat, chemicals, and infection, for job-related occupational safety and health purposes.

PPE can also be used to protect the working environment from pesticide application, pollution or infection from the worker (for example in a microchip factory).

Students even teacher during their laboratory period should require to use of personal protective equipment. Some of these are:

<ul style="list-style-type: none">Goggles – A large spectacles, with shields around the rims, for protecting the eyes from dust, excessive light, wind, etc.	<p>Touch the eye protection used when working with high concentrations of dust particles.</p> 
<ul style="list-style-type: none">Rubber Sole – A special type of shoes used to prevent electrical shock and for waterproofing and insulating purposes.	
<ul style="list-style-type: none">Apron – A garment worn over the front of the body as a protection for one's cloth.	
<ul style="list-style-type: none">Dust Mask– A covering for the face to prevent the inhaling or absorbing dust and other chemicals	

<ul style="list-style-type: none"> • Gloves - The covering material with a separate sheath for each finger used for hand protection. 	

Anti-Static and Safety Precautions

The little shock you experienced while you are walking across a carpeted floor or touched a door knob, table, counter or even another person is a result of static electricity. Static electricity is the discharge of electricity between two objects with different electrical potential. Humans can't feel a static shock until it is several thousand volts strong, but it takes less than 30 volts to fry a sensitive computer component, such as a stick of RAM or a processor.

That's why computer technicians and home computer builders have to guard their computers against the deadly ravages of static electricity, as well as take steps to avoid injury to yourself

Safety and Anti-Static Rules

- When possible, try to avoid working in carpeted areas. Carpeting greatly increases static buildup within your body.
- Always use an anti-static wrist strap when working on a computer (except when working on monitors)
- Always disconnect a computer from the AC power and from any powered peripherals while you are working on it.
- Always grasp a metal part of the computer chassis with your bare hand before you touch anything inside. Do this even if you are wearing an anti-static wristband.
- Always handle electronic components by a non-conducting (non-metallic) edge. Don't touch the pins or other connectors.
- Never plug an ATX power supply into AC power unless it is connected either to a computer's motherboard or to a dummy test load.
- Always use a UL-approved surge protector or an Uninterruptible Power Supply that incorporates surge and spike protection.
- Never eat, drink, or smoke while working on a computer.

Self Check 1.2-1

Instruction: Match the following images to their names and uses.



Apron – A garment worn over the front of the body as a protection for one's cloth

Gloves - The covering material with a separate sheath for each finger used for hand protection.

Goggles – A large spectacles, with shields around the rims, for protecting the eyes from dust, excessive light, wind, etc.

Rubber Sole – A special type of shoes used to prevent electrical shock and for waterproofing and insulating purposes

Dust Mask- A covering for the face to prevent the inhaling or absorbing dust and other chemicals

 Touch the eye protection used when working with high concentrations of dust particles.	Apron – A garment worn over the front of the body as a protection for one's cloth
	Gloves - The covering material with a separate sheath for each finger used for hand protection.
	Goggles - A large spectacles, with shields around the rims, for protecting the eyes from dust, excessive light, wind, etc.
	Rubber Sole – A special type of shoes used to prevent electrical shock and for waterproofing and insulating purposes
	Dust Mask - A covering for the face to prevent the inhaling or absorbing dust and other chemicals

ACTIVITY SHEET 1.2-1 PPE

Performance Objective:

The will be divided into groups. Each group has their own respective leader. The group will prepare a skit regarding personal protective equipment. After the activity they will be assessed thru the given Performance Criteria Checklist below:

PERFORMANCE CHECKLIST

Did you...		
	Yes	No
1. Clearly identified personal protective equipment.		
Utilized actual tools/device in performing the skit.		
3. Applied safety precautions during the play.		
4. Gave more critical thinking on the personal protective equipment.		
Cooperatively performed the play.		



INFORMATION SHEET 1.2-2

Introduction to Computer Operating System

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to be familiar with the different operating systems, navigate on the different OS components and install Operating system and device drivers.

Operating System (Os)

- is a software that manages computer resources and provides programmers/users with an interface used to access those resources.
- is a layer of software which takes care of technical aspects of a computer's operation. It shields the user of the machine from the low-level details of the machine's operation and provides frequently needed facilities.

Below is a listing of common operating systems available today, and who developed them.

Operating system	Developer	Operating system	Developer
Corel Linux	Corel	MS-DOS 5.x	Microsoft
Linux	Linux Torvalds	MS-DOS 6.x	Microsoft
MAC OS 8	Apple	Windows 2000	Microsoft
MAC OS 9	Apple	Windows 2003	Microsoft
MAC OS 10	Apple	Windows 95	Microsoft
MAC OS X	Apple	Windows 98	Microsoft
Mandrake Linux	Mandrake	Windows CE	Microsoft
MS-DOS 1.x	Microsoft	Windows ME	Microsoft
MS-DOS 2.x	Microsoft	Windows NT	Microsoft
MS-DOS 3.x	Microsoft	Windows Vista	Microsoft
MS-DOS 4.x	Microsoft	Windows XP	Microsoft

The Purpose of an Operating System

The operating system (OS) controls almost all functions on a computer.

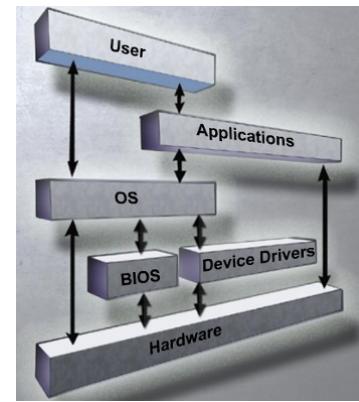
Roles of an Operating System

- All computers rely on an operating system (OS) to provide the interface for interaction between users, applications, and hardware.
- The operating system boots the computer and manages the file system.
- Almost all modern operating systems can support more than one user, task, or CPU.
- The operating system has four main roles:
 - Control hardware access
 - Manage files and folders
 - Provide user interface
 - Manage applications



Characteristics of Operating Systems

- Control hardware access
- OS automatically discovers and configures PnP hardware
- File and folder management
- User interface
- Command line interface (CLI)
- Graphical user interface (GUI)
- Application management
- Open Graphics Library (OpenGL)
- DirectX



The Types of Operating Systems

- Command Line Interface (CLI): The user types commands at a prompt.



- Graphical User Interface (GUI): The user interacts with menus and icons.



with

Most operating systems include both a GUI and a CLI.

Compare Operating Systems

Terms often used when comparing operating systems:

- **Multi-user** – Two or more users can work with programs and share peripheral devices, such as printers, at the same time.
- **Multi-tasking** – The computer is capable of operating multiple applications at the same time.
- **Multi-processing** – The computer can have two or more central processing units (CPUs) that programs share.
- **Multi-threading** – A program can be broken into smaller parts that can be loaded as needed by the operating system. Multi-threading allows individual programs to be multi-tasked.

Real Mode

- Executes only one program at a time
- Addresses only 1 MB of system memory at a time
- Directly accesses memory and hardware
- Subject to crashes
- Available to all modern processors
- Only used by DOS and DOS applications



Protected Mode

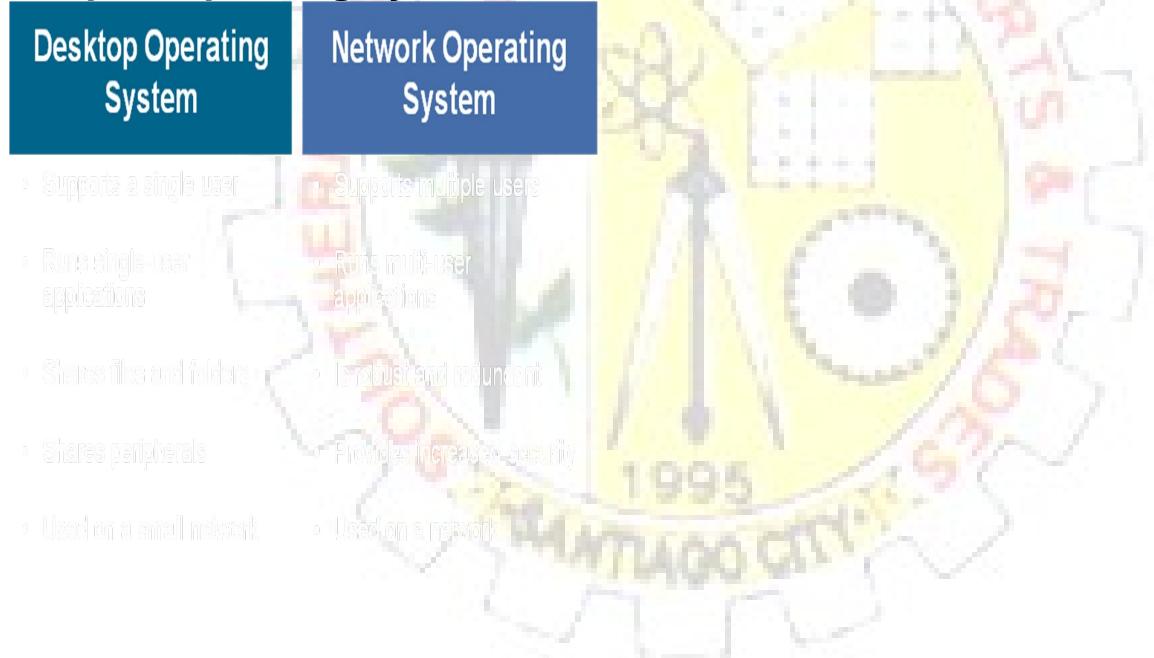
- Has access to all memory
- Can manage multiple programs simultaneously
- Allows the system to use virtual memory
- Provides 32-bit access to memory, drivers, and I/O transfers
- Each program is assigned a space in memory
- Computer is protected from program errors

Virtual Real Mode

- Allows a real-mode application to run within a protected-mode operating system
- Creates virtual machines for each program that runs in real mode
- Each virtual machine receives 1 MB of memory and access to hardware
- In the event of a program error, only the virtual machine is affected
- OS provides virtual machine to host the code and protect the PC



Compare Operating Systems



Compare Operating Systems

- Desktop operating systems:
- Microsoft Windows: Windows XP
- Macintosh: Mac OS X
- Linux: Fedora, Ubuntu, and others
- UNIX
- A desktop OS has the following characteristics:
- Supports a single user
- Runs single-user applications
- Shares files and folders on a small network security



with limited

Network Operating Systems (NOS)

- Common NOS include:
- Novell Netware
- Microsoft Windows Server
- Linux
- UNIX
- A network OS has the following characteristics:
- Supports multiple users
- Runs multi-user applications
- Is robust and redundant
- Provides increased security compared to desktop operating systems



desktop

Determine Proper Operating System

To select the proper operating system:

- Create an accurate profile of your customer by analyzing the daily, weekly, and monthly computer activities
- Select appropriate software and hardware to satisfy existing and future requirements

What Does Your Customer Require?

- Office applications
- word processing, spreadsheets, or presentation software
- Graphics applications
- Photoshop or Illustrator
- Animation applications
- Flash
- Business applications
accounting, contact management, sales tracking or database

Identify Minimum Hardware Requirements

- Customer may need to upgrade or purchase additional hardware to support the required applications and OS.
- A cost analysis will indicate if purchasing new equipment is a better idea than upgrading.
- Common hardware upgrades:
- RAM capacity
- Hard drive size
- Processor speed
- Video card memory and speed

Hardware Compatibility List (HCL)

- Most operating systems have an HCL.
- HCLs can be found on the manufacturer's website.
- HCL includes list of hardware that is known to work with the operating system.

Installing the Operating System

Reasons to perform a clean installation of an OS:

- When a computer is passed from one employee to another
- When the operating system is corrupted
- When a new replacement hard drive is installed in a computer

Before performing a clean installation:

- Back up all data first
- Explain to the customer that existing data will be erased

Confirm that all needed data has been successfully transferred

Hard Drive Setup Procedures

Operating system setup methods:

- Install an OS over a network from a server
- Install from a copy of the OS files stored on the hard drive
- Install from OS files stored on CDs or DVDs

Partitioning and Formatting

- Hard drive must be logically divided (partitioned)
- File system must be created on the hard drive
- During the installation phase, most operating systems will automatically partition and format the hard drive

Hard Drive Setup Procedures

A technician should understand the process related to hard drive setup.



Prepare the Hard Drive

- The first portion of the installation process deals with formatting and partitioning the hard drive.
- The second portion prepares the disk to accept the file system.
- The file system provides the directory structure that organizes the user's operating system, application, configuration, and data files.
- Examples of file systems:
- The FAT32 file system
- The New Technology File System (NTFS)

Install the Operating System

During the Windows XP installation the user must provide:

- Define currency and numerals
- Text input language
- Name of user
- Name of company
- Product key
- Computer name
- Administrator password
- Date and time settings
- Network settings
- Domain or workgroup information



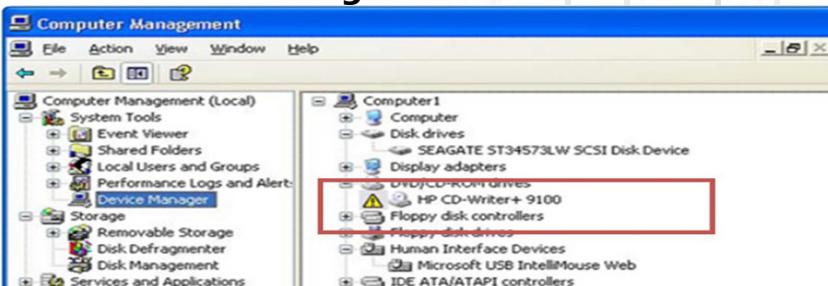
Create Administrator Account

- Setup creates the administrator account with the user name "administrator"
- Change this name to keep the administrator account secure
- Only use the administrator account occasionally for critical system changes
- Create a fictitious user account to use as a template
- Use secure passwords
- These should be a minimum of 7 characters, containing at least one of each (letter, number, and symbol)

Complete the Installation

- When Windows XP installation completes:
- Computer will reboot
- Log in for the first time
- Register Windows XP and verify that you are using a legal copy of the OS
- Verification enables you to download patches and service packs
- Use Microsoft Update Manager to scan for new software and to:
- Install all service packs
- Install all patches

Check Device Manager for Conflicts



- Look for warning icons (yellow exclamation points)
- Double-click to learn about the problem
- Click the plus (+) sign to expand the category
- May be able to ignore an error

Custom Installation Options

With Microsoft System Preparation

- Follow these steps for disk cloning:
- Create a master installation on one computer
- Run Sysprep
- Create a disk image of the configured computer using third-party disk-cloning software
- Copy the disk image onto a server
- When the destination computer is booted,
- A shortened version of the Windows setup program runs
- Setup configures only user-specific and computer-specific settings
- An answer file provides data normally required during set up

The Boot Sequence for Windows XP

- Power On Self Test (POST)
- POST for each adapter card that has a BIOS
- BIOS reads the Master Boot Record (MBR)
- MBR takes over control of the boot process and starts NT Loader (NTLDR)
- NTLDR reads the BOOT.INI file to know which OS to load and where to find the OS on the boot partition
- NTLDR uses NTDETECT.COM to detect any installed hardware
- NTLDR loads the NTOSKRNL.EXE file and HAL.DLL
- NTLDR reads the registry files and loads device drivers
- NTOSKRNL.EXE starts the WINLOGON.EXE program and displays the Windows login screen

NTLDR and the Windows Boot Menu

- If more than one OS is present on the disk, BOOT.INI gives the user a chance to select which to use.
- Otherwise:
- NTLDR runs NTDETECT.COM to get information about installed hardware
- NTLDR then uses the path specified in the BOOT.INI to find the boot partition
- NTLDR loads two files that make up the core of XP: NTOSKRNL.EXE and HAL.DLL
- NTLDR reads the Registry files, chooses a hardware profile, and loads device drivers

The Windows Registry

- Recognized by distinctive names, beginning with HKEY_
- Every setting in Windows is stored in the registry
- Changes to the Control Panel settings, File Associations, System Policies, or installed software are stored in the registry
- Each user has their own section of the registry
- The Windows logon process uses the registry to set the system to the state that it was in the last time the user logged in

The Windows Registry Files

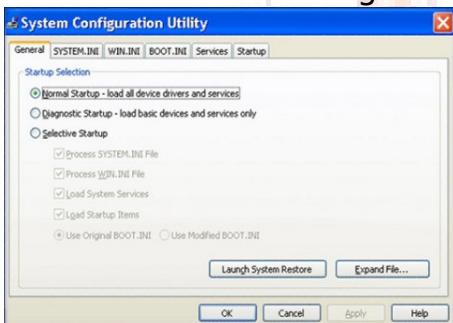
HKEY	DESCRIPTION
HKEY_CLASSES_ROOT	Information about which file extensions map to a particular application
HKEY_CURRENT_USER	Information, such as desktop settings and history, related to the current user of a PC
HKEY_USERS	Information about all users who have logged onto a system
HKEY_LOCAL_MACHINE	Information relating to the hardware and software
HKEY_CURRENT_CONFIG	Information relating to all active devices on a system

The NT Kernel and Security Authority

- Next, the NT kernel, NTOSKRNL.EXE, takes over
- It starts the login file, WINLOGON.EXE
- That program starts the Local Security Administration file, LSASS.EXE (Local Security Administration)
- LSASS.EXE is the program that displays the XP welcome screen
- There are few differences between the Windows XP and the Windows 2000 boot process

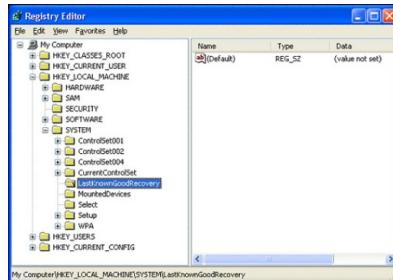
Manipulating Operating System Files

- After you have installed Windows XP, you can use MSCONFIG for post-installation modifications:
- This boot configuration utility allows you to set programs that will run at startup, and to edit configuration files



Manipulating Operating System Files

- The registry is a database that contains information and settings for all of the hardware, software, users and preferences. REGEDIT allows users to edit the registry.



Manipulating Operating System Files

Pressing the F8 key during the boot process opens the Windows Advanced Startup Options menu, which allows you to select how to boot Windows.

- Safe Mode – Starts Windows but only loads drivers for basic components, such as the keyboard and display.
- Safe Mode with Networking Support – Starts Windows identically to Safe Mode and also loads the drivers for network components.
- Safe Mode with Command Prompt – Starts Windows and loads the command prompt instead of the GUI interface.
- Last Known Good Configuration – Enables a user to load the configurations settings of Windows that was used the last time that Windows successfully started. It does this by accessing a copy of the registry that is created for this purpose.

Describing Directory Structures

- Windows file system naming conventions:
- Maximum of 255 characters may be used
- Characters such as a period (.) or a slash (\ /) are not allowed
- An extension of three or four letters is added to the filename to identify the file type
- Filenames are not case sensitive
- Windows filename extension examples:
- .doc - Microsoft Word
- .txt - ASCII text only
- .jpg - graphics format
- .ppt - Microsoft PowerPoint
- .zip - compression format

Describing Directory Structures

- Each file has a set of attributes that control how the file may be viewed or altered.
- The following are the most common file attributes:
- R - The file is read-only
- A - The file will be archived the next backup
- S - The file is marked as a system file and a warning is given if an attempt is made to delete or modify the file
- H - The file is hidden in the directory display

The ATTRIB Command

```

C:\>chdir temp
C:\TEMP>dir
Volume in drive C has no label.
Volume Serial Number is 7127-C544

Directory of C:\TEMP

03-31-2007  01:33 PM    <DIR>          .
03-31-2007  01:33 PM    <DIR>          ..
02-20-2005  01:15 PM           648 auk-commands.txt
02-19-2005  06:49 PM           404 countries.txt
05-26-2005  02:08 PM           52 lab-commands.txt
05-26-2005  02:08 PM           95,235 lab.sysadmin.doc
03-31-2007  01:33 PM           0 My Archived file.txt
03-31-2007  01:33 PM           0 My Read-only file.txt
03-31-2007  01:33 PM           96,398 bytes free
03-31-2007  01:33 PM           2 Dir(s)   3,200,147,496 bytes free

C:\TEMP>attrib
A C:\TEMP\auk-commands.txt
A C:\TEMP\countries.txt
A C:\TEMP\file1103.txt
A C:\TEMP\lab.sysadmin.doc
A C:\TEMP\My Archived file.txt
A C:\TEMP\My Read-only file.txt
H C:\TEMP\My Read-only file.txt
R C:\TEMP\My Read-only file.txt

C:\TEMP>

```

NTFS and FAT32

- FAT32 is used where files need to be accessed by multiple versions of Windows. FAT32 is not as secure as NTFS
- NTFS can support more and larger files than FAT32, and provides more flexible security features for folders, files, and sizes
- Partitions can be converted from FAT32 to NTFS using the CONVERT.EXE utility, but not in the reverse direction

Navigating a Graphical User Interface (GUI)

- A GUI provides graphical representations of all the files, folders, and programs on a computer.



Customizing the Desktop

To customize any of these, simply right-click the item and then select Properties.

- Taskbar
- Recycle Bin
- Desktop background
- Window appearance

The Start Menu

- Customized to two styles, XP and Classic
- Accessed by clicking the Start button
- The Start menu includes:
- A nested list of all installed applications
- A list of recently opened documents
- A list of other elements, including; a feature, a help center, and system



search
settings

My Computer

- When you right-click My Computer and select Properties, there are several settings that can be customized:
- Computer name



Properties, there

- Hardware settings
- Virtual memory
- Automatic updates
- Remote access
- Files can also be moved and copied using My Computer

Launching Applications

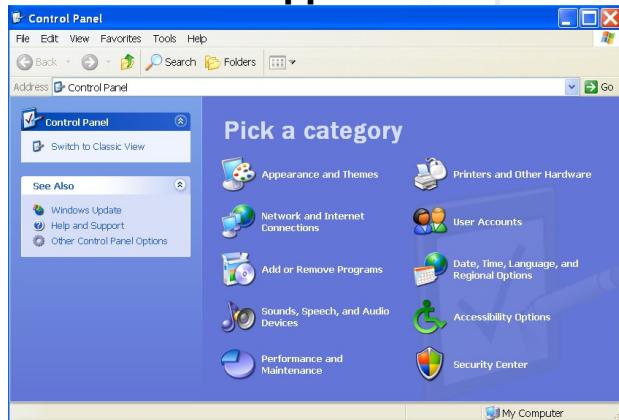
Applications can be launched in several ways:

- Click the application on the Start menu
- Double-click the application shortcut icon on the desktop
- Double-click the application executable file in **My Computer**
- Launch the application from the Run window or command line

To view and configure network connections, right-click the **My Network Places** icon.

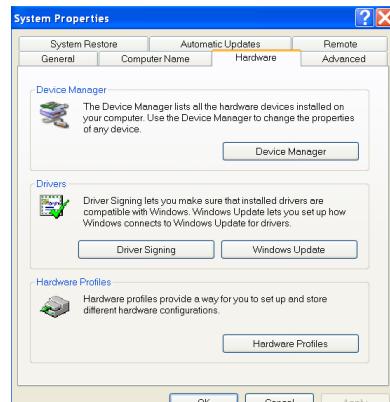
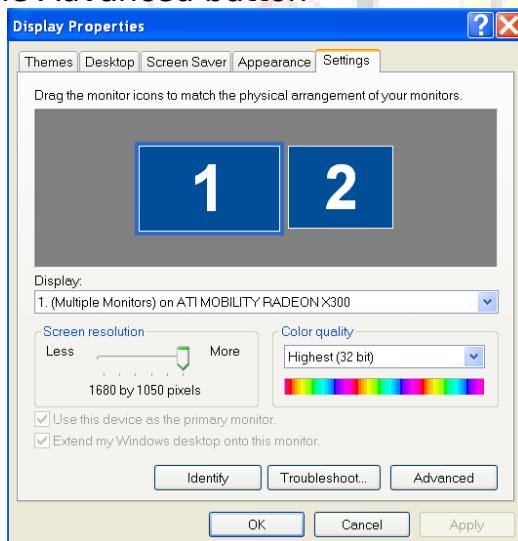
- Connect to or disconnect from a network drive
- Right-click **Properties** to configure existing network connections, such as a wired or wireless LAN connection

Control Panel Applets



Display Settings

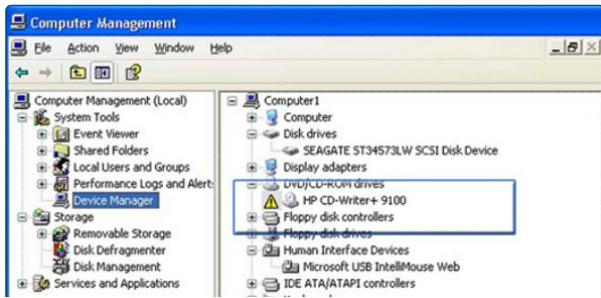
- Change the resolution and color quality
- Change wallpaper, screen saver, power settings, and other options, by clicking the Advanced button



Device Manager

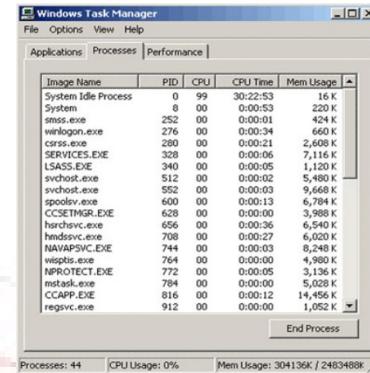
- Used to view settings for devices in the computer
- An exclamation mark indicates a problem device

computer
with a



Task Manager

- View all applications that are currently running
- Close any applications that have stopped responding
- Monitor the performance of the CPU and memory
- View all processes that are currently running
- View information about the network connections



running

virtual

Event Viewer and Remote Desktop

Event Viewer

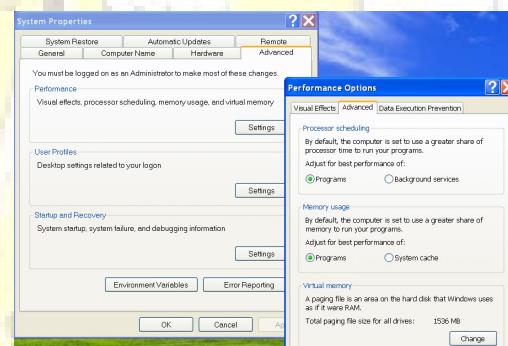
- Logs a history of events regarding applications, security, and the system.
- These log files are a valuable troubleshooting tool.

Remote Desktop

- Allows one computer to remotely take control of another computer.
- This troubleshooting feature is only available with Windows XP Professional.

Performance Settings

Settings for advanced visuals and for memory



virtual

Add or Remove an Application

- Utility to install or uninstall applications
- Tracks installation files for future thorough uninstall, if desired



Upgrading an Operating System

Upgrade Paths

Upgrading to Windows XP

1. Insert the Windows XP CD. Select Start > Run.
2. In the Run box, where D is the drive letter for the CD-ROM, type D:\i386\winnt32 and press Enter. The Welcome to the Windows XP Setup Wizard displays.
3. Choose Upgrade to Windows XP and click Next. The License Agreement page displays.
4. Read the license agreement and click the button to accept this agreement.
5. Click Next. The Upgrading to the Windows XP NTFS File System page displays.
6. Follow the prompts and complete the upgrade. When the install is complete, the computer will restart.

Preventive Maintenance Planning

Components of a preventive maintenance plan:

- Updates to the operating system and applications
- Updates to anti-virus and other protective software
- Hard drive error checking
- Hard drive backup
- Hard drive defragmentation

Schedule Tasks

- The DOS AT command launches tasks at a specified time using the command line interface
- Information about the AT command is available at this path: **Start > Run > cmd**. Then type **AT /?** at the command line.
- The Windows Task Scheduler launches tasks at a specified time using a graphical interface
- Access the Windows Task Scheduler by following this path: **Start > All Programs > Accessories > System Tools > Scheduled Tasks**
- Examples of scheduled tasks to run
- **ScanDisk** (Windows 2000) and **CHKDSK** (Windows XP) check the integrity of files and folders and scan the hard disk surface for physical errors.
- **Defrag**: Gathers the noncontiguous data into one place, making files run faster

Automatic Updates

- An automatic update service scans the system for needed updates, and recommends what should be downloaded and installed.
- Automatic update services can setup to download and install updates as soon as they are available or as required, and install them when the computer is next rebooted.

Restore Point

An image of the current computer settings. If the computer crashes, the OS can roll back to a restore point.

- The restore point utility only operates on OS and application files.
- Anti-virus software should be run to remove malware before creating a restore point.

When to create a restore point:

- Before updating or replacing the OS
- When an application or driver is installed
- Manually at any time

Backup the Hard Drive

- Backup tools allow for recovery of data.
- Use the Microsoft Backup Tool to perform backups.
- Establish a backup strategy that will allow for the recovery of data.
- Decide how often the data must be backed up and the type of backup to perform.
- Windows XP uses Volume Shadow Copying, which allows users to continue to work even as a backup is taking place.
- It is only necessary to make copies of the files that have changed since the last backup.

Types of Backups

	Description	Clear marker
Normal	Selected files and folders	Yes
Copy	Selected files and folders	No
Differential	Selected files and folders that changed since the last backup	No
Incremental	Selected files and folders that changed since the last backup	Yes
Daily	Selected files and folders that changed during the day	No



SELF-CHECK 1.2-2

Operating System

Use a separate sheet of paper in answering.

1. Discuss the importance of Operating system .
2. Name some of the common operating systems used nowadays.

ANSWER KEY 1.2-2

1. Operating System configures and manages hardware and it helps to connect hardware and applications.
2. Common operating systems are MAC OS, Windows, MS-DOS and Linux.



Job Sheet 1.2-1

Title	: Installation of Operating System
Performance Objective	: Given a working personal computer you are going to partition the hard disk in two, format in NTFS, install Operating system & necessary drivers. Duration 1.5 hours.
Supplies, Tools & Equipment	:
<ul style="list-style-type: none">• Working PC• OS Installer• Drivers Software• Manuals	
Steps/ Procedure: <ol style="list-style-type: none">1. Start Computer<ol style="list-style-type: none">a. Check cable connections if it is properly connected.b. Connect the power cord to the power outlet.c. Switch on the AVR & UPSd. Switch on the CPU & Monitor2. Go to CMOS setup & change boot option to CD or DVD Drive<ol style="list-style-type: none">a. Press the Del key or F1b. On boot option select CD or DVD drive as your first boot & hard disk in the second.c. Save and restart the computer.3. Install Operating System using Fresh installation.<ul style="list-style-type: none">• Start your computer from the Windows XP CD-ROM. To do this, insert the Windows XP CD-ROM into your CD drive or DVD drive, and then restart your computer.• When you see the "Press any key to boot from CD" message, press any key to start the computer from the Windows XP CD-ROM.• At the Welcome to Setup screen, press ENTER to start Windows XP Setup.• Read the End-User License Agreement, and then press F8.• Follow the instructions on the screen to delete, create select and format a partition where you want to install Windows XP.<p>Note : Delete partition and create another two partition using NTFS.</p><ul style="list-style-type: none">• Follow the instructions on the screen to complete Windows XP Setup.4. Install Necessary Drivers.<ul style="list-style-type: none">• Right click My Computer• Go to Properties• Click Hardware• Open Device Manager• Right Click the device with yellow Question mark• Click Update drivers• Select No Not at this time	

- Click next
- Select an option if what you want the wizard to do
- Click next
- Wait until the driver will be installed.

Assessment Method:

Demonstration , Performance Criteria checklist



Performance Criteria Checklist 1.2-1

CRITERIA	Ye s	No
Did you....		
Started the computer properly		
Made CD/DVD Drive as first boot option		
Deleted partition/s		
Created two partition		
Formatted Hard disk in NTFS		
Installed Operating System		
Installed all necessary drivers		
Applied OHS procedures.		



INFORMATION SHEET 1.2-3

Software Packages and Use of Application Programs

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to use Software Packages and Application Programs.

Software is the component of a computer system which refers to the set of instructions written in a code that computers can understand and execute. Another name for this set of instructions is program.

Three Types of Software

1. System Software
2. Application Software
3. Programming Language

System Software. This software tells the CPU what to do, a more common term is Operating System (OS). The most popular OS in use for PC microcomputer is Microsoft's MS DOS. DOS for short is a collection of various programs that help control

your PC. Other operating systems are Microsoft Windows (from the early Windows 95 and 98 to the current windows Vista, OS 2, MAC OS, Unix, Linux and Apple's OS 9).

Application Software. This is designed and written to perform specific personal, business, or scientific processing tasks, such as payroll, processing, human resource management, or inventory management. Common Application software are the following:

- **Word Processor** – This serves as an electronic typewriter and even more. With word processors, the user can easily produce quality documents like memos and reports. Popular word processors include MS Word and Word Perfect.
- **Spreadsheets**- These are programs that simulate a paper divided into rows and columns, where values can be placed. These are used for advanced numerical analysis and calculations. Some of the more common spreadsheet programs are Lotus 1-2-3 and, Ms Excel and Open Calculate.
- **Database Programs** – These serve to collect a structured collection of data, which can later be managed and manipulated.
- **Presentation Software** – These are programs that allow users to create electronic presentation for reports and other functions.
- **Desktop Publishing Software** – This allow the user to create page makeups and do simple typesetting to produce various materials, such as books pamphlets, reports, and booklets. Example of DTP software are MS Publisher, and PageMaker.
- **Reference Software** – These are electronic versions of various references such as encyclopedia, almanacs, atlases, dictionaries, thesauri, and the like.
- **Graphics Programs** – These allow the creation and manipulation of graphics, images, objects, and pictures. Some of the common graphics programs are CorelDraw, Photoshop, and Computer Aided Design (CAD)
- **Educational Software** – These include tutorials and electronic lessons that give students knowledge or training in a particular subject or skill, such as Math or Science or in gardening or cooking.
- **Computer Games** – These are programs that simulate real games or provide entertainment and adventure to users.
- **Network Software** – These are programs that make it possible for computers in different areas to be connected, allowing their users to communicate with each other.
- **Language Software** – These provide programmers with the necessary tools to write programs and instructions to computer.

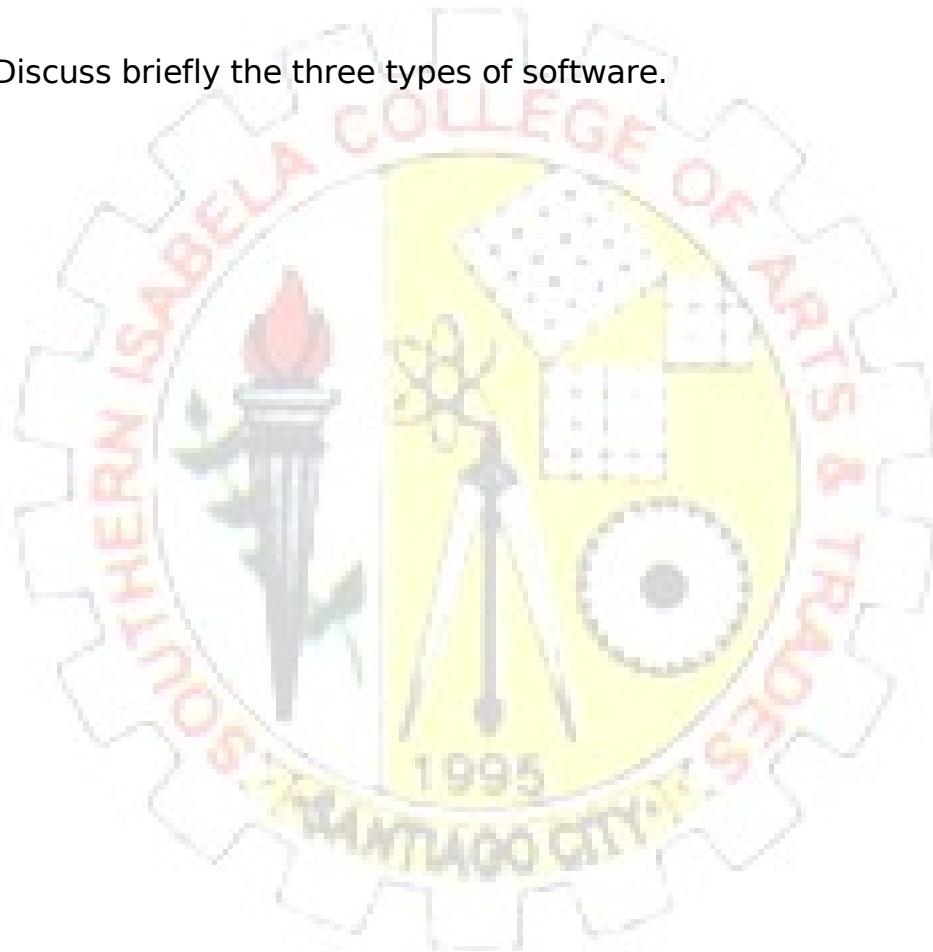
Programming Software. Programmers use this software for making computer programs. Programming software is a tool to make software using different programming languages.

SELF-CHECK 1.2 -3

A. TRUE OR FALSE. Write T if the statement is true and correct and F if it is not. Use a separate sheet of paper in answering.

1. Word processors are used to create special movie effects.
2. Systems software tells the CPU what to do.
3. Software refers to the set of instructions that computer can understand and execute.
4. Reference software includes tutorial and electronic lessons that give students knowledge or training in a particular subject or skill.
5. Graphics Program allow the users to execute electronic presentations for reports and other functions.

C. Discuss briefly the three types of software.



ANSWER KEY 1.2-3

A. True or False

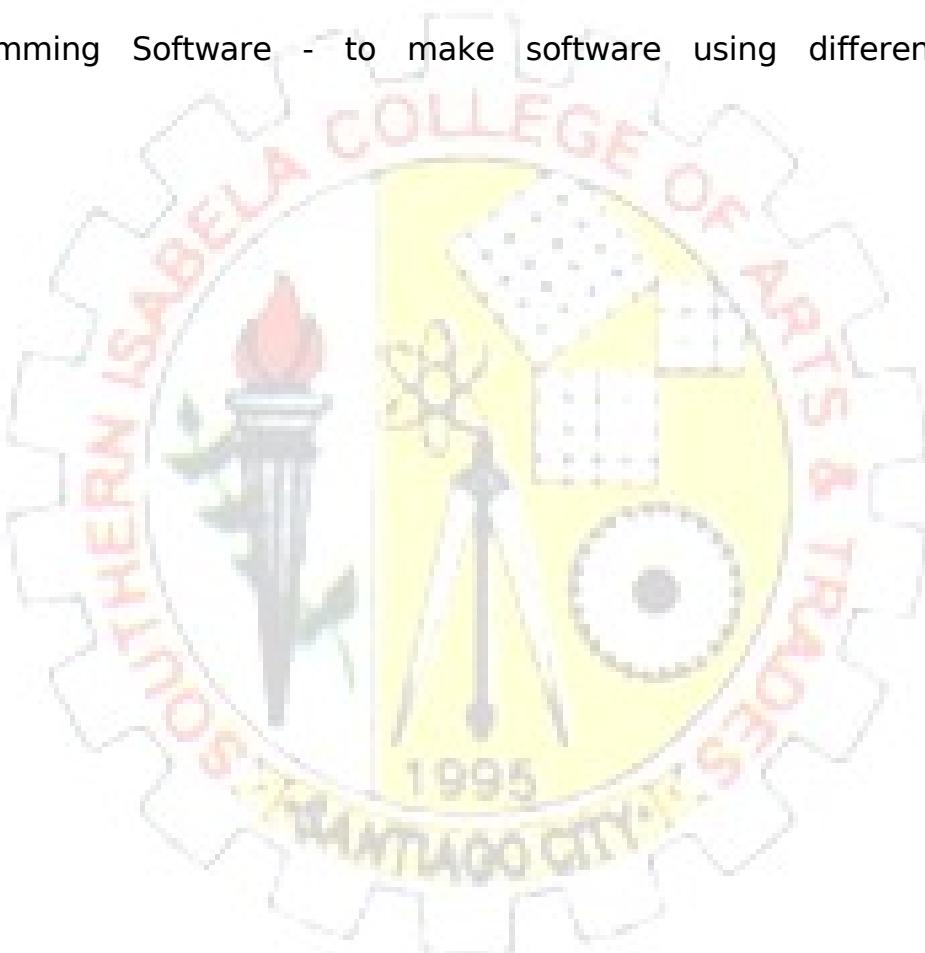
1. False
2. True
3. True
4. False
5. False

B.

System Software – tells the Central processing unit what to do.

Application Software – This is designed and written to perform specific personal, business, or scientific processing tasks, such as payroll processing, human resource management, or inventory management.

Programming Software - to make software using different programming languages.



INFORMATION SHEET 1.2-4

Peripheral Devices

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to be familiar with Peripheral Devices.

Peripheral device is any component or piece of equipment that expands a computer's input, storage, and output capabilities. Peripheral devices serve specific purpose, enhance a computer's functions, or add new service or additional resources.

1. **Video Card** - converts the processor's output information into a video signal that can be sent through a cable to the monitor.
2. **Sound Card** – enhances the computer's sound-generating capabilities by allowing sound to be output **Philips Screw Driver**- Used to drive or fasten positive slotted screws through speakers
3. **Monitor** – is the display device that takes the electrical signals from the video card and forms an image using points of colored light on the screen.
4. **Speaker** – plays sounds transmitted as electrical signals from the sound card.
5. **Printer** - an output device that produces text and graphics on paper.
6. **Keyboard** – an input device that converts letters, numbers, and other characters into electrical signals readable by the processors.
7. **Mouse** – is used for inputting commands and to manipulate objects viewed on the computer display screen.
8. **Microphone** - a device that converts sounds to electrical signals by means of a vibrating diaphragm.
9. **Scanner** - it is an input device that reads text or illustration printed on paper, translates the information into a form that a computer can use.
10. **Digital Camera** – use a light-sensitive processor chip to capture photographic images in digital form on a small diskette inserted in the camera or on flash memory chips.
11. **Graphic tablet** – objects are drawn using a pen or a puck. The puck is technically a tablet cursor, not a mouse.
12. **Joy Stick** - a hand-held control stick that allows a player to control the movements of a cursor on a computer screen or a symbol in a video game .

SELF-CHECK 1.2-4

A. MULTIPLE CHOICE. Write the letter of the correct answer.

Use a separate sheet of paper in answering.

1. What do you call a device converts computer output into display images?
 - A. Floppy disk
 - B. Monitor
 - C. Printer
 - D. Processor
2. Which of the following is a secondary storage device?
 - A. Floppy Disk Drive
 - B. Memory Chip
 - C. Printer
 - D. Processor
3. If you want to enhance your computer's capabilities, which would you install?
 - A. Monitor
 - B. Sound Card

- C. Speaker
- D. Video Card

What part of the main circuit board would you connect a peripheral device such as keyboard, printer or video monitor?

- a. The Bus
- b. Port
- C. Expansion Slot
- D. Cable

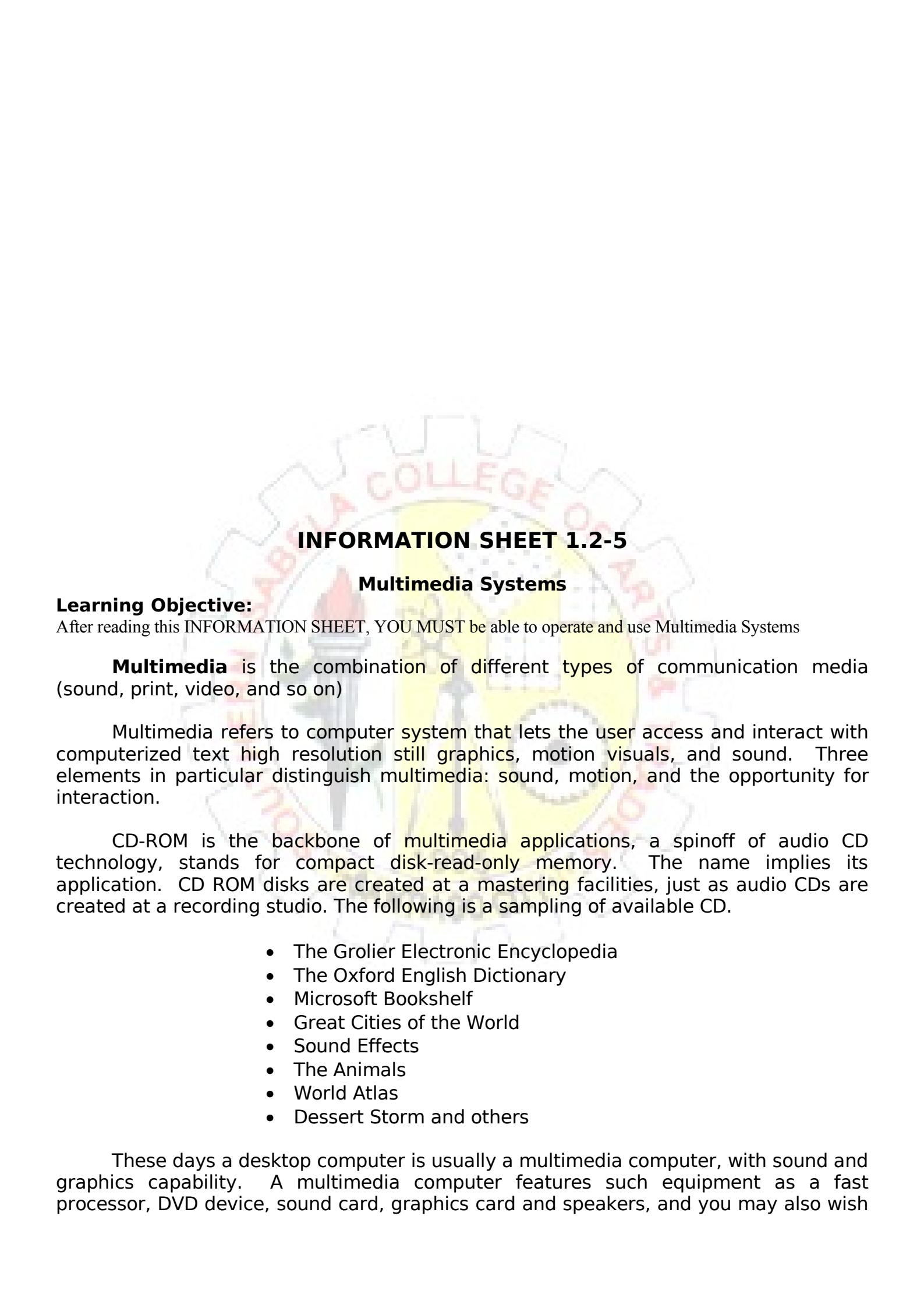
5. You want a hard copy of your input, which would provide you this?

- A. Monitor
- B. Printer
- C. Speaker
- D. Video Camera

ANSWER KEY 1.2-4

Multiple Choice.

- a
- c
- d
- b
- c



INFORMATION SHEET 1.2-5

Multimedia Systems

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to operate and use Multimedia Systems

Multimedia is the combination of different types of communication media (sound, print, video, and so on)

Multimedia refers to computer system that lets the user access and interact with computerized text high resolution still graphics, motion visuals, and sound. Three elements in particular distinguish multimedia: sound, motion, and the opportunity for interaction.

CD-ROM is the backbone of multimedia applications, a spinoff of audio CD technology, stands for compact disk-read-only memory. The name implies its application. CD ROM disks are created at a mastering facilities, just as audio CDs are created at a recording studio. The following is a sampling of available CD.

- The Grolier Electronic Encyclopedia
- The Oxford English Dictionary
- Microsoft Bookshelf
- Great Cities of the World
- Sound Effects
- The Animals
- World Atlas
- Desert Storm and others

These days a desktop computer is usually a multimedia computer, with sound and graphics capability. A multimedia computer features such equipment as a fast processor, DVD device, sound card, graphics card and speakers, and you may also wish

to have headphones and microphones. You may even wish to add scanner, sound recorder, and digital camera.

Multimedia presentations are becoming more and more prevalent. These types of presentations are being used not only in encyclopedia and other reference tools, but for selling a product or teaching a new concept.



SELF-CHECK 1.2-5

1. What is multimedia? Give examples of communication media.
2. Discuss the importance of multimedia in maintaining, upgrading and repairing our Personal Computers.



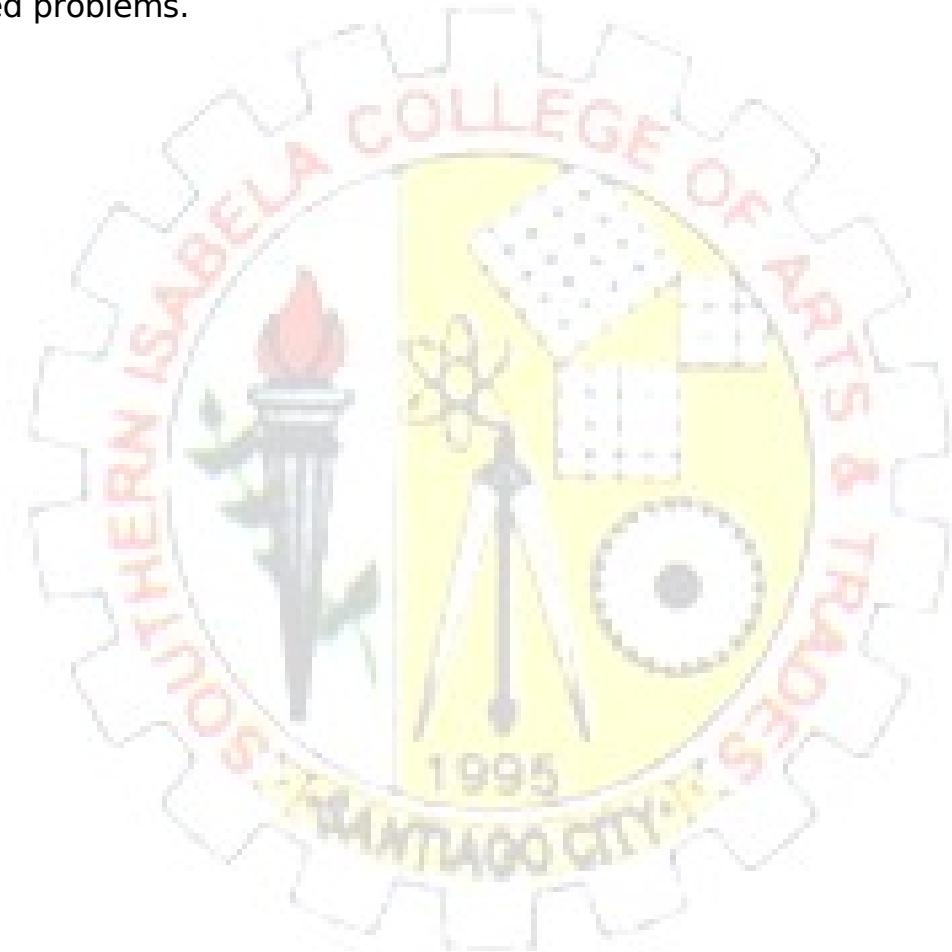
ANSWER KEY 1.2-5

1. Multimedia is the combination of different types of communication media (sound, print, video, and so on)

Multimedia refers to computer system that lets the user access and interact with computerized text high resolution still graphics, motion visuals, and sound. Three elements in particular distinguish multimedia: sound, motion, and the opportunity for interaction.

2. Since CD-ROM is the backbone of multimedia applications we now have different software applications that help the computer technician or even the user to maintain, upgrade, install and repair our computers.

Also to be considered the different websites from the internet that help us in solving and fixing related problems.



INFORMATION SHEET 1.2-6

Computer Hardware

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to familiarize Computer hardware and enumerate its functions and uses.

HARDWARE Refers to the tangible (things you can touch) components of a computer system. Hardware components are further divided into three groups namely

- Input Devices
- Output devices
- System Unit

INPUT DEVICES. Performs the two most basic computing tasks: issuing commands and entering data. Common input devices are the following:

- **Keyboard** – is a standard input device of most computers



MOUSE

KEYBOARD

- **Mouse** – is a hand-clicked device used for pointing. The modern mouse uses a ball for movement and has two to three buttons.

- **Trackball** – is like a stationary, upside down mouse.

- **Joystick** – is an input device which is commonly used for computer games

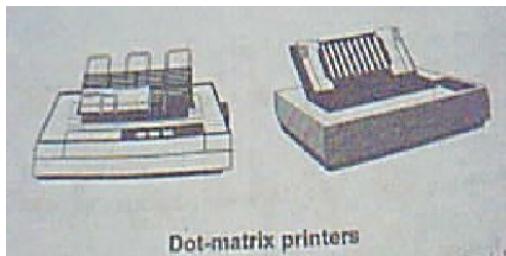


LIGHT PEN

- **Light pen** – a device used to draw, write, or issue commands when it touches a specially designed screen.

OUTPUT DEVICES. After processing the data fed into computer with the use of input devices, the information must now be outputted in a form understood by human beings. Output devices are classified according to the output they can produce. An output which you can hold in your hand is called hard copy. Output types such as audio and video are referred to as soft copy. The following are output devices used.

- **Printer** - an output device that produces text and graphics on paper



Dot-matrix printers

NON-IMPACT PRINTER

IMPACT PRINTER

- **Video Monitors** – The monitor, or display is used to provide soft copy output. Video monitors are either monochrome or colored

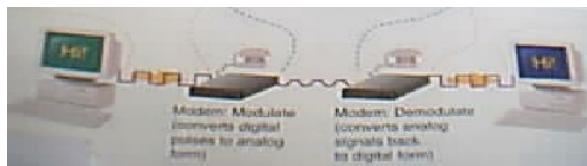


VIDEO MONITOR



SPEAKERS

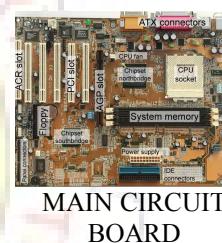
- **Speakers**- play sounds transmitted as electrical signals from the sound card.
- **Modem** – a device that sends and receives data over telephone lines to and from computers.



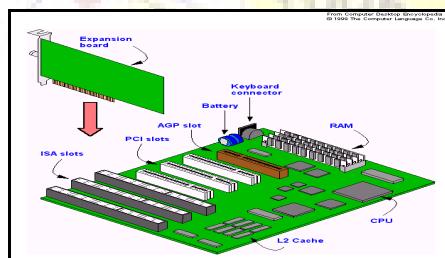
Modem

THE SYSTEM UNIT. The system unit is the part of the computer which is responsible for accepting and processing the data brought in by the input devices. It also responsible for passing the resulting information to the users via the output devices.

- **The Main Circuit Board** - Also called the "system the main printed circuit board in an electronic device, contains sockets that accept additional boards. In a computer, the motherboard contains the bus, CPU and coprocessor sockets, memory sockets, keyboard and supporting chips.
- **Port** – is a connection from the main circuit board to a peripheral device such as a keyboard, a printer or a video monitor. The port is also called an interface. Ports are arranged at the rear of the main circuit board.
- **Expansion Slot** – is a receptacle inside a computer or other electronic system that accepts printed circuit boards.



board," is which personal controller

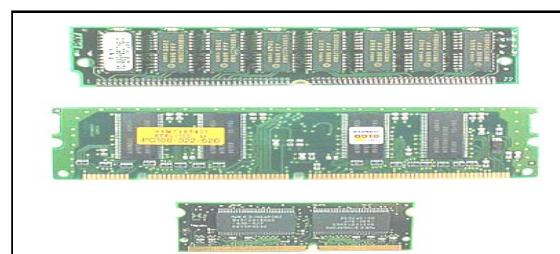


- **The Bus.** is responsible for transporting electronic signals from place to place or specific predefined routes.
- **The CPU – The CPU** is the computer's processor, controller and storage device
- **Case and Power Supply** – is also known as the system unit, the case or system cabinet is the box that holds all the computer's internal parts. It contains the central processing unit (CPU), the memory chips, and the power supply. It also houses drives such as the hard disk drive and CD-ROM or DVD drive. It has a fan to cool down the circuitry free from overheating.



POWER SUPPLY

- **Clock** – it synchronizes the operation of all parts of the PC, and provides the basic timing signal for the CPU.
- **Memory** – The memory in a computer system is of two fundamental types: The main memory and the secondary memory.

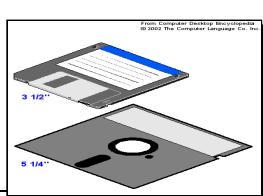


Memory cards

- **RAM-(Random Access Memory)** is a group of memory chips, typically of the dynamic RAM (DRAM) type, which function as the computer's primary workspace. The "random" in RAM means that the contents of each byte of storage in the chip can be directly accessed without regard to the bytes before or after it.
- **BIOS – The BIOS (Basic Input / Output System)** is a ROM chip that provide.
- **CMOS** – stores the configuration of the PC (example the password, disk type, amount of memory installed, current time and data). CMOS stands for Complimentary Metal-Oxide Semiconductor.
- **Secondary Memory** – Secondary memory is where programs and data are kept for a long term basis. Common secondary storage devices are the floppy disk and hard disk, Compact disk or CD.
- **FLOPPY DISK** – (or diskette) is as flimsy as a sheet of paper but is protected by a sturdy, square jacket that encases it. It has a low capacity, and is very, very slow compared to other storage devices.



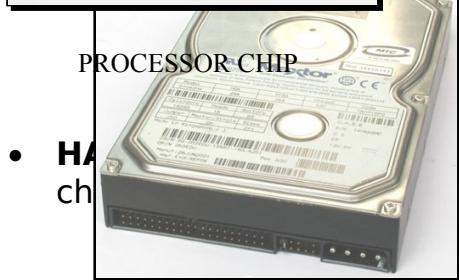
PROCESSOR CHIP



FLOPPY DISK



FLOPPY DRIVE



- **HARD DISK DRIVE** – a device that store billions of characters on magnetic platters.



CD-ROM/DVD Drive

- **CD-ROM/DVD DRIVE** – A CD (computer disk) drive, or its more recent variant, a DVD (digital video disk, is a storage device that use laser technology to read data from optical disks.
- **VIDEO CARD** – is a board that is plugged into a period computer to give it display capabilities. It connects the processor's output information into a video signal that can be sent through a cable to the monitor.

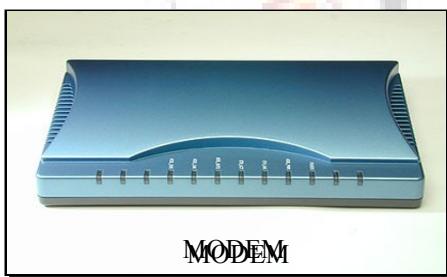


VIDEO CARD

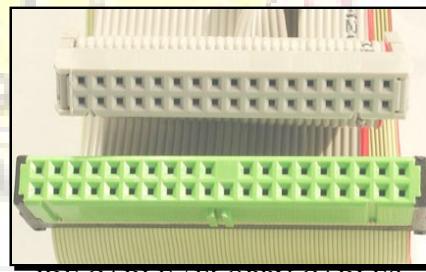


SOUND CARD

- **SOUND CARD** - enhances the computers sound generating capabilities by allowing sound to be output through speakers.
- **MODEM** – A modem is a device that sends and receives data over telephone lines to and from computers.



MODEM

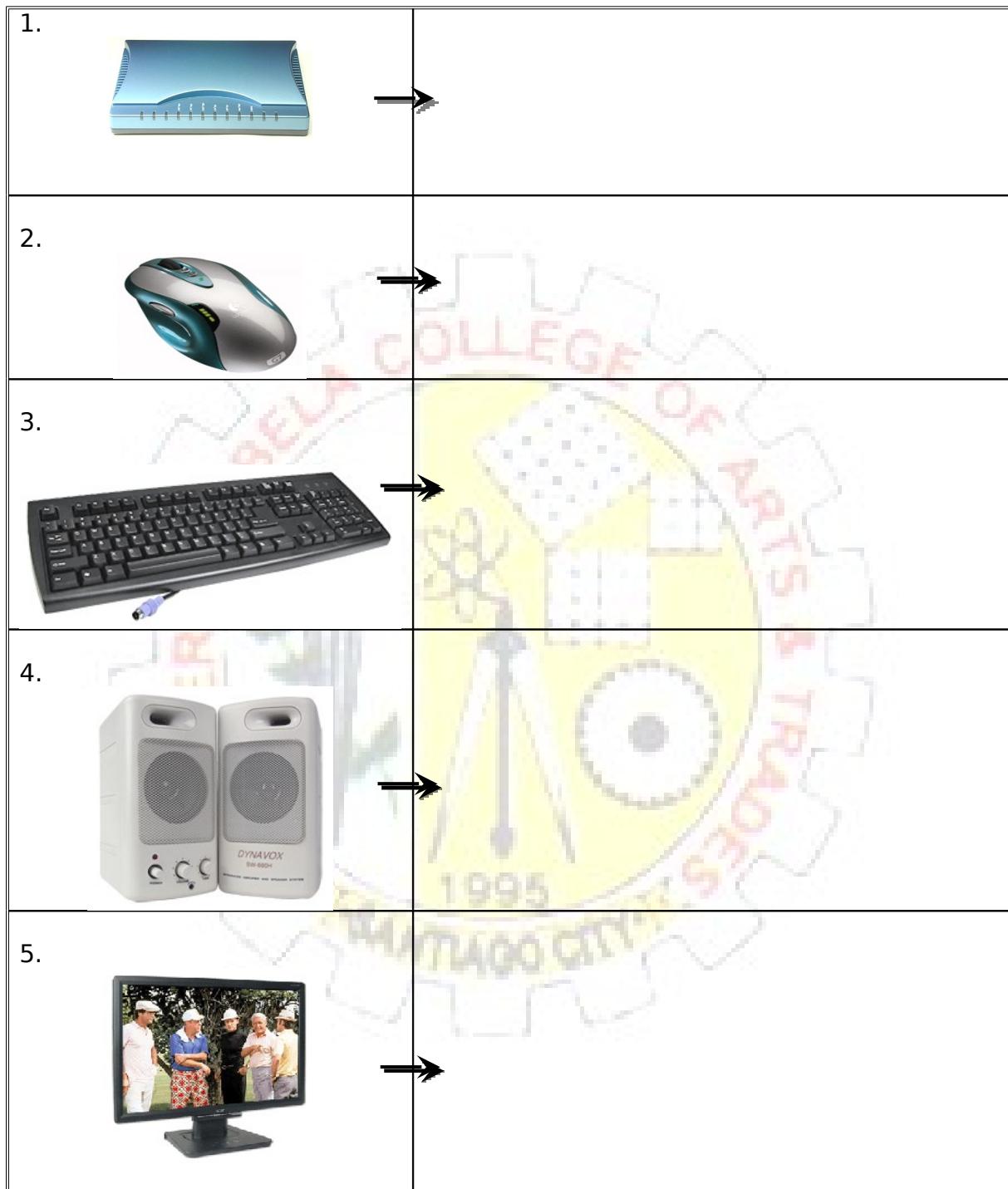


IDE CABLE / FLOPPY CABLES

- **POWER CABLES** – it supplies power from the power supply to the drive. The power cables are red, yellow and black. The yellow wire furnishes 12 volts of power, the red wire furnishes 5 volts of power, the two black wire are ground wire for each.
- **IDE AND FLOPPY DISK RIBBON CABLE** – IDE stands for Integrate Device Electronics. It shows how to connect an IDE cable to two devices namely the top device (master) and the bottom device (slave).

SELF-CHECK 1.2-6

A. Identification. Label the following peripheral devices and give their functions.
Use a separate sheet of paper in answering.



B. TRUE OR FALSE. Write True if the statement is correct and False if it is wrong.

1. The main memory is a software component.
2. Processing is the manipulation by which a computer transforms data into information.
3. The operating system is the part of the system software.
4. Input devices include the keyboard and the mouse.

5. Main memory is where programs and data are kept on along term basis.



ANSWER KEY 1.2-6

1. Modem - allows a given computer to share data or otherwise a device which let computers exchange information
2. Mouse – It is used for pointing and also to easily access other commands
3. Keyboard – It is primarily used in entering and editing data
4. Speaker – It play sounds transmitted as electrical signals from the sound card.
5. Monitor – It displays activity inside the computer

B.True or False

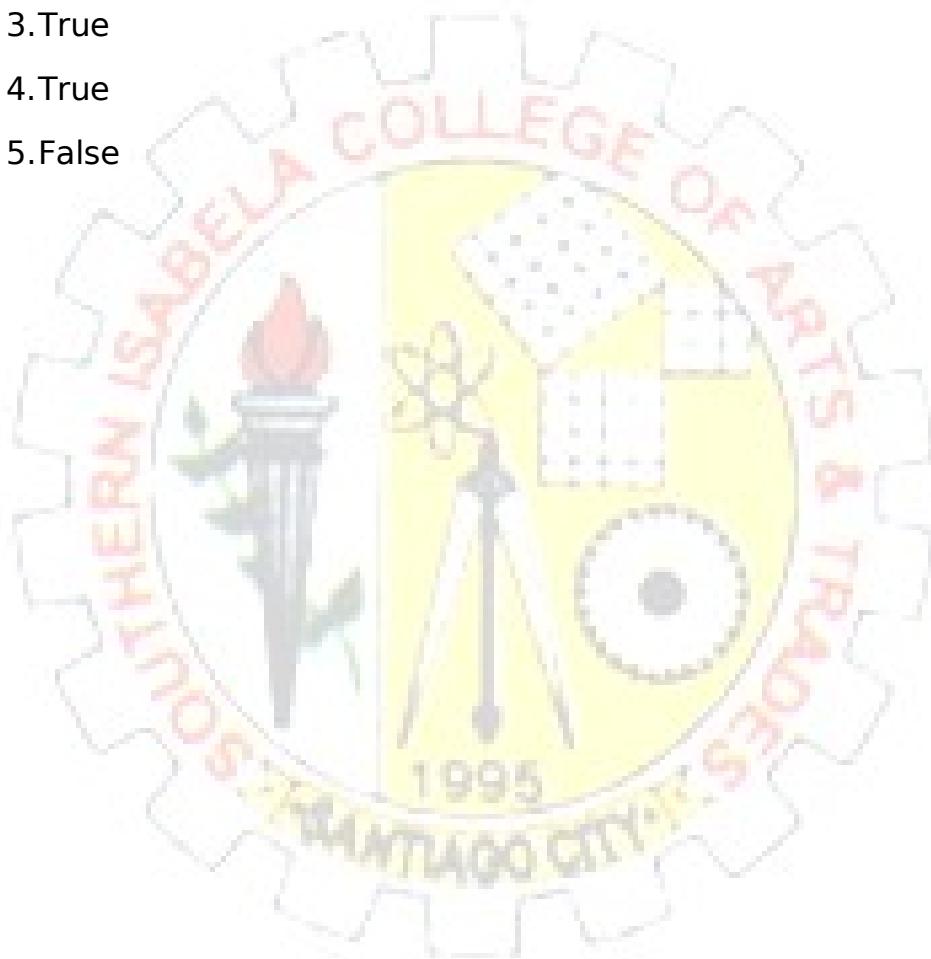
1.False

2.True

3.True

4.True

5.False



INFORMATION SHEET 1.2-7

LOCAL AREA NETWORKS (LANs) SYSTEMS AND CONFIGURATIONS

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to crimp LAN cable, configure the system and check the connectivity of your work.

A **network** is a group of interconnected computers, linked for the purpose of sharing files, programs and peripherals. Through your computers or office network, you

can run programs, use printers, and edit files from other computers as if they were located on your own.

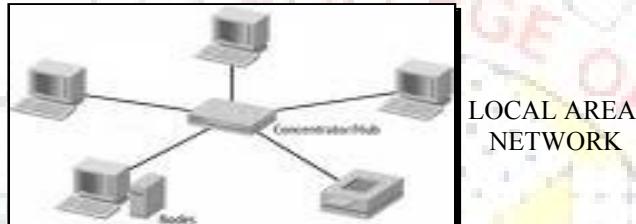
A server is the computer on the network that manages the network resources, such as the shared files, programs and printers.

Local-area network (LAN) is a computer network covering a small geographic area, like a home, office, or group of buildings e.g. a school.

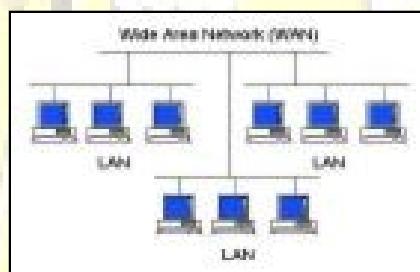
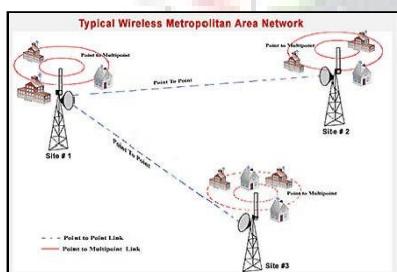
The majority of networking, particularly at the corporate level, is done using the internet standard. At the center of the basic diagram of a wired network is either a hub or a switcher and computers are connected to the hub, much like spokes of a wheel or star. Each connection at the hub is called a *port*.

Three Basic Network Categories

- **Local Area Network**- the smallest of the three network types, consists of PCs connected together within a limited area, such as within the same building, floor or department.



- **Metropolitan Area Network** – is a network that spans no more than 50 miles. It is designed to connect LANs spanning a town or city



METROPOLITAN AREA NETWORK

WIDE AREA NETWORK

- **Wide Area Network** – is used to distribute information thousand of miles among thousands of users.

Network Terms:

- **Network Server**- is a powerful computer whose sole purpose is to serve network clients.

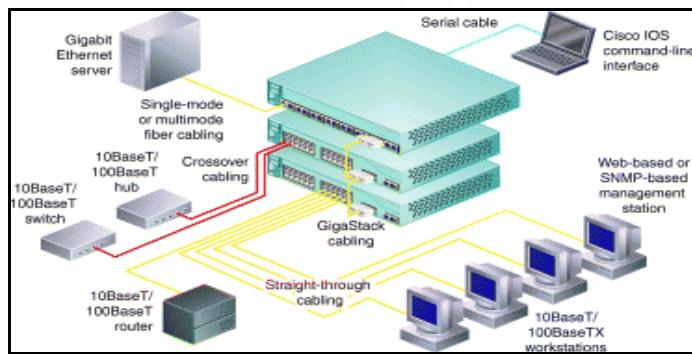


NETWORK SERVER

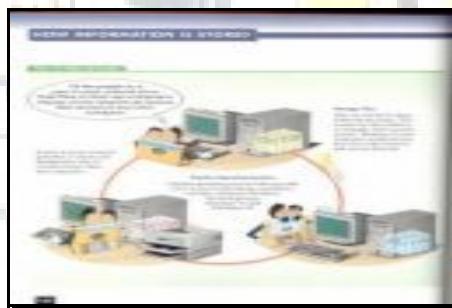
- **Host** – any computer whether mainframe, server, or even PC that acts as an information source on a network.
- **Peers** - mean any computer sharing the same protocol layer with another computer.
- **Workstation**- is any network computer that connects to and request resources from a network
- **Protocol** – refers to the specific standards governing the sending and receiving of data.

Types of Networks

- **server/client** –use a network operating system to manage the entire work.



- **Peer-to-peer** - no centralized computer oversees the networks, no server, and computers simply connect with each other in a network group to share files, printers, and internet access.



The Basic Rule

The basic rule for network design is known as the 5-4-3 rule. It states that in a 10 Mbps. Ethernet network:

- you can have a maximum of five cable segments between any two computers
- you can have a maximum of four repeaters (hubs, switches, wireless access points, etc.) between any two computers
- of the five cable segments (maximum) between any computers, only three of these can terminate in computers.

How to wire Ethernet Cables

How to wire your own ethernet cables and connectors.

What You Need:

Required:

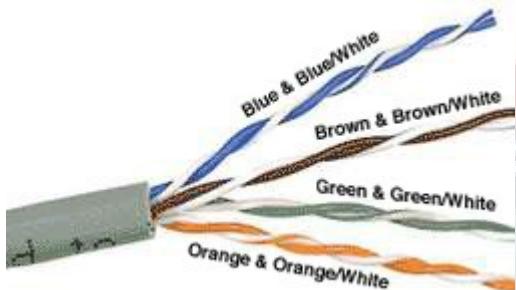
- CAT 5 Cable - bulk Category 5, 5e or 6 cable
- RJ45
- Crimper for RJ45
- Wire Cutters - to cut and strip the cable if necessary

Recommend:

- Wire Stripper
- Cable Tester

About the Cable:

Here is what the internals of the cable look like:



Internal Cable Structure and Color Coding

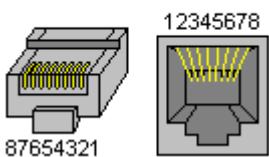
Inside the cable, there are 8 color coded wires. These wires are twisted into 4 pairs of wires, each pair has a common color theme. One wire in the pair being a solid or primarily solid colored wire and the other being a primarily white wire with a colored stripe (Sometimes cable doesn't have any color on the striped cable, the only way to tell is to check which other wire it is twisted around).

About the RJ45 Ends:

The RJ45 end is a 8-position modular connector that looks like a large phone plug. There are a couple variations available.

Here is a diagram and pinout:

Where is pin #1?



RJ45 Jack and Plug Pinout

Ethernet Cable Pinouts:

There are two basic cables. A straight through cable, which is used to connect to a hub or switch, and a cross over cable used to operate in a peer-to-peer fashion without a hub/switch. Some interfaces can cross and un-cross a cable automatically as needed, really quite nice.

Standard, Straight-Through Wiring (both ends are the same):

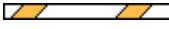
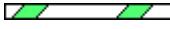
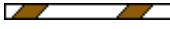
RJ45 Pin #	Wire Color (T568A)	Wire Diagram	10Base-T Signal 100Base-TX	1000Base-T Signal
1	White/Green		Transmit+	BI_DA+
2	Green		Transmit-	BI_DA-
3	White/Orange		Receive+	BI_DB+
4	Blue		Unused	BI_DC+
5	White/Blue		Unused	BI_DC-
6	Orange		Receive-	BI_DB-
7	White/Brown		Unused	BI_DD+
8	Brown		Unused	BI_DD-

Straight-Through Cable Pinout for T568A

RJ45 #	Wire Color (T568B)	Wire Diagram	10Base-T Signal 100Base-TX	1000Base-T Signal
1	White/Orange		Transmit+	BI_DA+
2	Orange		Transmit-	BI_DA-
3	White/Green		Receive+	BI_DB+
4	Blue		Unused	BI_DC+
5	White/Blue		Unused	BI_DC-
6	Green		Receive-	BI_DB-
7	White/Brown		Unused	BI_DD+
8	Brown		Unused	BI_DD-

Straight-Through Cable Pinout for T568B

Cross Over Cable (T568B):

RJ45 Pin # (END 1)	Wire Color	Diagram End #1	RJ45 Pin # (END 2)	Wire Color	Diagram End #2
1	White/Orange		1	White/Green	
2	Orange		2	Green	
3	White/Green		3	White/Orange	
4	Blue		4	White/Brown	
5	White/Blue		5	Brown	
6	Green		6	Orange	
7	White/Brown		7	Blue	
8	Brown		8	White/Blue	

Cross Over Cable Pinouts

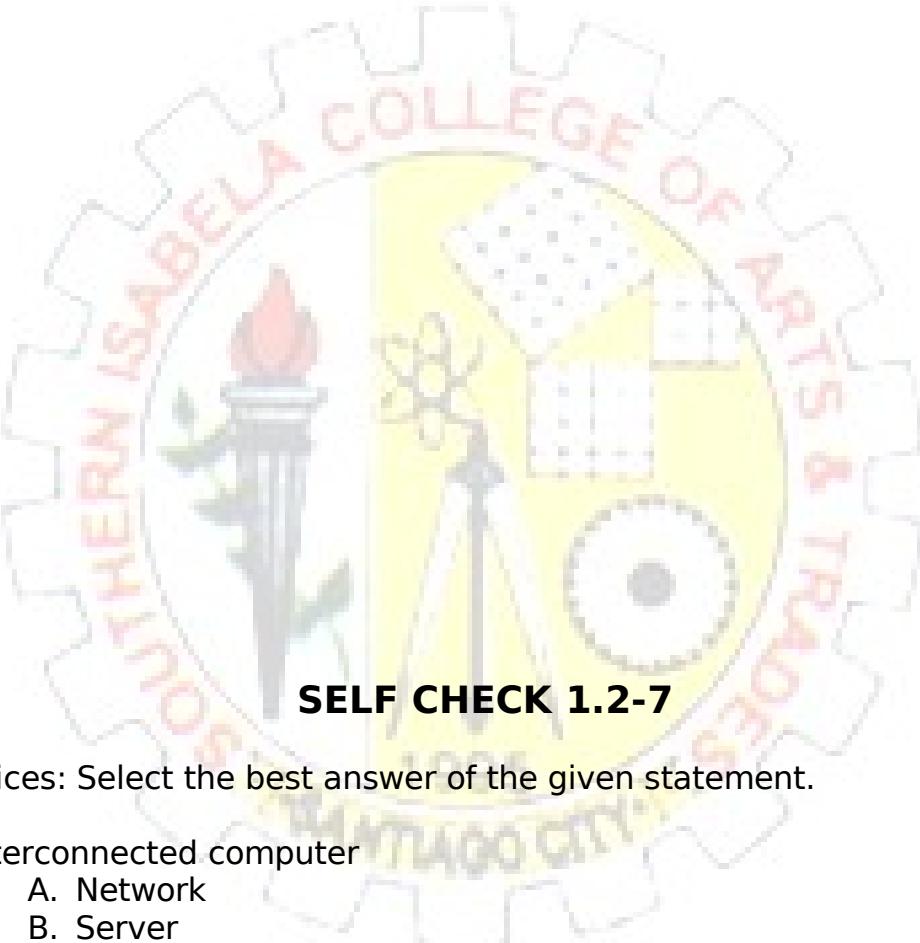
+Note: The cross over cable layout is suitable for 1000Base-T operation, all 4 pairs are crossed.

How to wire Ethernet Cables:

1. Strip off about 2 inches of the cable sheath.
2. Untwist the pairs - don't untwist them beyond what you have exposed, the more untwisted cable you have the worse the problems you can run into.
3. Align the colored wires according to the diagrams above.
4. Trim all the wires to the same length, about 1/2" to 3/4" left exposed from the sheath.
5. Insert the wires into the RJ45 end - make sure each wire is fully inserted to the front of the RJ45 end and in the correct order. The sheath of the cable should extend into the RJ45 end by about 1/2" and will be held in place by the crimp.
6. Crimp the RJ45 end with the crimper tool
7. Verify the wires ended up the right order and that the wires extend to the front of the RJ45 end and make good contact with the metal contacts in the RJ45 end.
8. Cut the cable to length - make sure it is more than long enough for your needs. Remember, an end to end connection should not extend more than 100m (~328ft). Try to keep cables short, the longer the cable becomes the more it may affect performance, usually noticeable as a gradual decrease in speed and increase in latency.
9. Repeat the above steps for the second RJ45 end.

10. If a cable tester is available, use it to verify the proper connectivity of the cable.

That should be it, if your cable doesn't turn out, look closely at each end and see if you can find the problem. Usually a wire ended up in the wrong place or more commonly, one of the wires didn't extend to the front of the RJ45 connector and is making no, or poor contact. If you see a mistake or problem, cut the end off and start again.



SELF CHECK 1.2-7

Multiple Choices: Select the best answer of the given statement.

A group of interconnected computer

- A. Network
- B. Server
- C. Workgroup
- D. Sharing

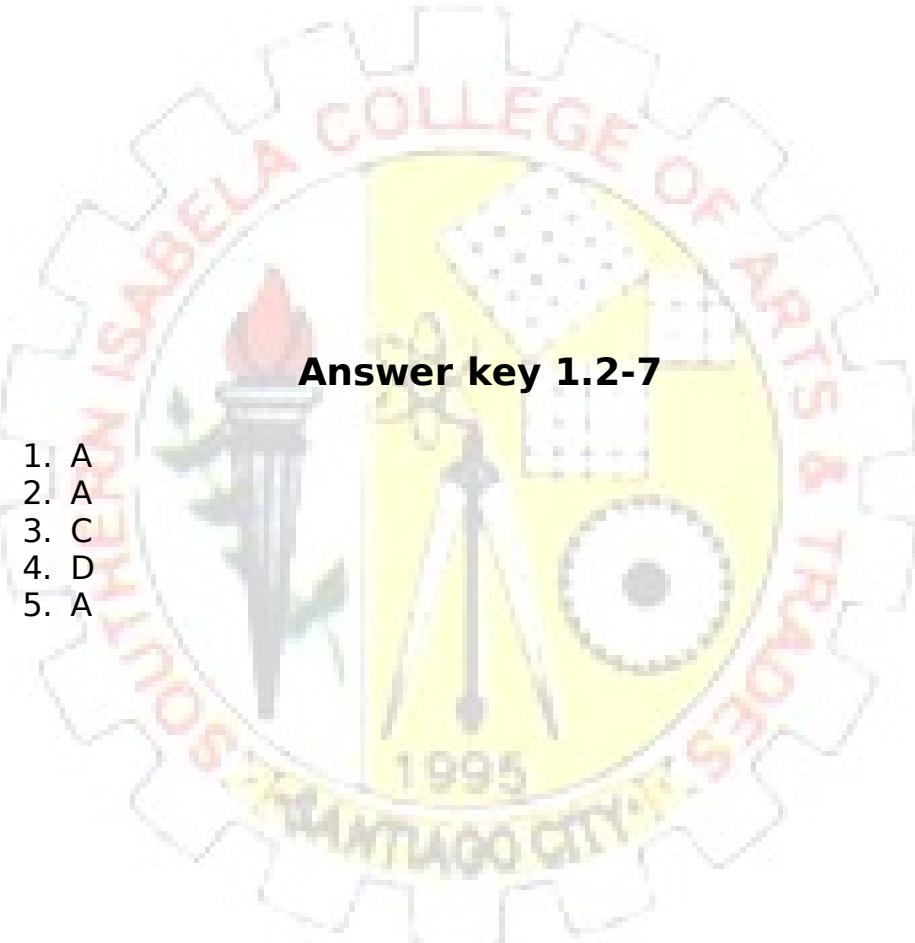
2. The smallest type of network

- A. Local Area network
- B. Metropolitan Area Network
- C. Wide Area Network
- D. All of the above

3. A powerful computer whose sole purpose is to serve network clients

- A. Host
- B. Peers
- C. Network Server
- D. Workstation

4. Any network computer that connects to and request resources from a network.
 - A. Host
 - B. Peers
 - C. Network Server
 - D. Workstation
5. Any computer whether mainframe, server or even PC that acts as an information sources of a network
 - A. Host
 - B. Peers
 - C. Network Server
 - D. Workstation



Answer key 1.2-7

1. A
2. A
3. C
4. D
5. A

TASK SHEET 1.2-1

Title	: Network Cable Connection
Performance Objective	: Given the necessary tools and materials you are going to make crossover and straight cable connection and test the connectivity of your cable.
Supplies	: UTP Cable, RJ 45
Tools/Equipment	: Crimping tool Network Hub Working Computer with OS Server Internet connection Cable Tester

Steps/ Procedure:

1. Prepare the necessary tools and materials
2. Use UTP Cable and 4 RJ-45 to make Straight & Cross-over connection.
3. Follow the procedures in crimping UTP cable in Information sheet 1.2-7
3. Check the connectivity of your cables.
4. Let your trainer check your work.

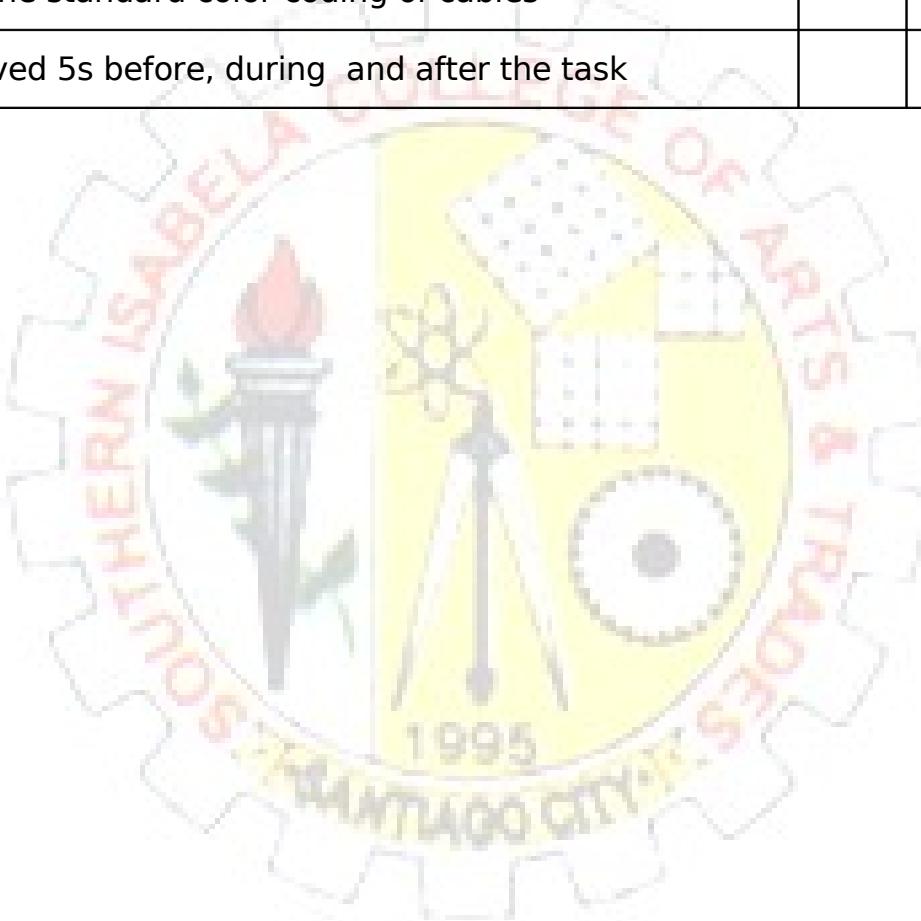
Assessment Method:

Demonstration with questioning , Performance Criteria checklist



PERFORMANCE CHECKLIST

Did you...	Performance Criteria	
	YES	NO
1. Prepared all materials needed		
2. Used the correct procedure in crimping RJ-45		
3. Crimped cross-over & straight though connection correctly		
4. Checked the connectivity of two cables		
5. Observed Safety Precautions while working		
6. Used the standard color coding of cables		
7. Observed 5s before, during and after the task		



INFORMATION SHEET 1.2-8

Computer Symptoms and Diagnosis

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to Identify and diagnose computer symptoms.

No matter how well built your PC is, and how well written its software, something is eventually going to go wrong.

Many times, computers will get slow for seemingly no reason at all. Devices often malfunction and system problems can arise out of nowhere. For people who rely on their computer for business or personal use, these computer errors can be frustrating and problematic.

One of the most important aspects of using a PC is taking care of it. Maintenance involves keeping your hard disk in optimum working condition, checking for errors, and backing up important files. Maintenance tasks also include adding new hardware to your system and updating the files that control your hardware (called drivers).

Common Error Messages

As you work on your computer, there are error messages that come up. The machine at times tries to tell you where the problem is. These messages are like detective clues for the Help Desk.

Common Problems

1. My monitor is blacked out
2. I don't have any sound.
3. My machine is stuck and wont do anything

Checking of Peripherals

Keyboards

- If our machine, when booting, gives off a constant beeping noise, it is telling that your computer keyboard is not connected or not working.
- If there is no response, check the indicator light on the keyboard.
- Is there a key stuck? Gently pry off the cover and clean it with alcohol. Make sure it is not connected to your machine when you are cleaning it.

Mouse

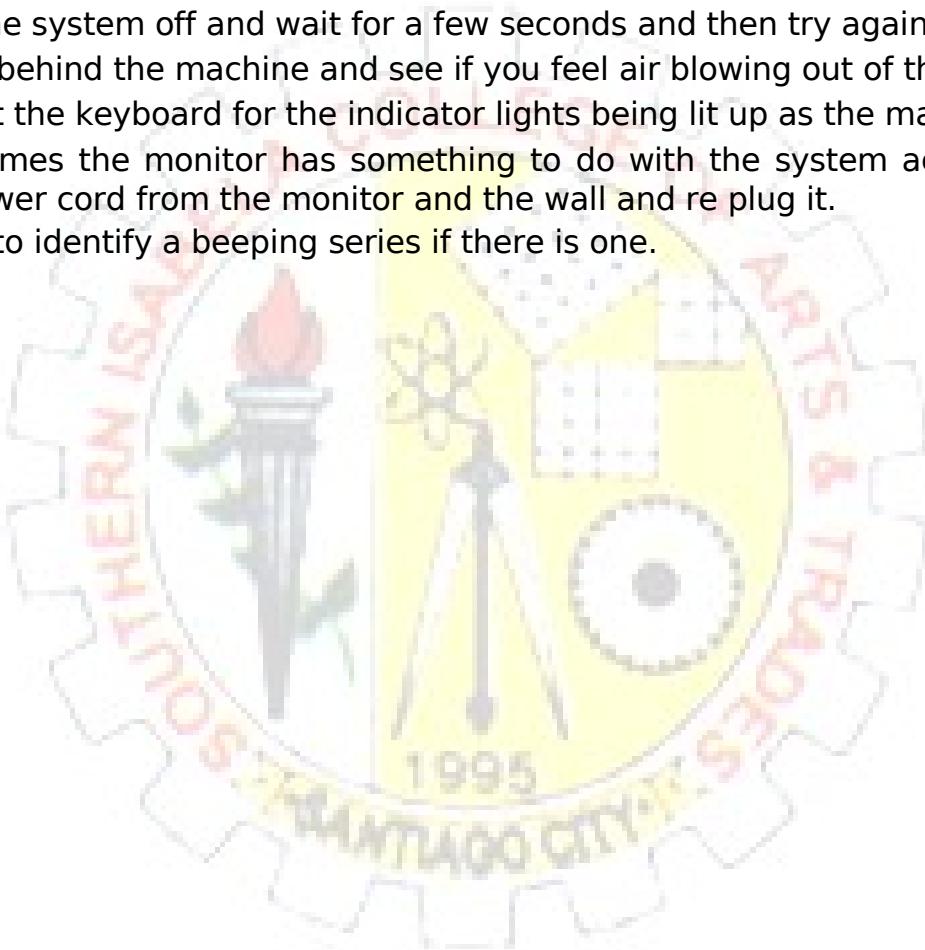
- If your mouse starts acting erratic, it could be an insufficient memory problem.
- If your mouse will only move one way, either vertically or horizontally, your mouse may need cleaning. Shut down your machine and unplug your mouse from the computer.
- Optical mouse need cleaning of its bottom every now and then too.

Printer

- Verify that the printer is working correctly by running a test print.
- Unplug the printer cable from the back of the PC and try to print the printer
- Reattach the printer and run another test print,
- Turn off the printer and try to print to it.
- What error messages appear? Turn the printer back on and run a test print
- Turn off the printer and remove the ink or toner cartridge. Turn the printer back on. Do any error messages appear? Try printing to the printer. Do any error messages show up them?
- Reinstall the ink or toner cartridge and run a test print. Remove all of the paper from your printer and then try to print it. What error messages appear now?

A Dead PC

- First check the cable
- Check the wall outlet
- Turn the system off and wait for a few seconds and then try again.
- Reach behind the machine and see if you feel air blowing out of the power supply.
- Look at the keyboard for the indicator lights being lit up as the machine boots.
- Sometimes the monitor has something to do with the system acting up. Unplug the power cord from the monitor and the wall and re plug it.
- Listen to identify a beeping series if there is one.



Self Check 1.2-8

True or False: Write T if the statement is and F if the statement is False

1. Computer will get slow for seemingly no reason at all.
2. One of the most important aspects of using a PC is taking care of it.
3. The computer never tries to tell you where the problem is.
4. If your machine, when booting, give of a constant beeping noise. It is telling that your mouse is not connected or not working.
5. The first step to check the dead PC is to check the cable.



Answer Key

1. T
2. T
3. F
4. F
5. T



TASK SHEET 1.2-2

Computer Symptoms and Diagnosis

Performance Objectives

Given the following tools, materials and equipment, perform computer symptoms and diagnosis.

You will be assessed using the criteria in the performance checklist.

Equipment, Tools, and Materials: Window system, any type of printer

Procedures:

2. Start the computer and check for error messages.
3. Check all peripheral devices

4. Check the hard disk and optical drives
5. Check the device Drivers
6. Check Application Programs
7. Run System utilities
8. Perform Test Printing.

Assessment Method:

Performance Criteria Checklist



Did you.....	Performance Criteria	
	YES	NO
1. Started the computer and checked for error messages		
2. Checked all peripheral devices		
3. Checked Hard Disk		
4. Checked optical Drives		
5. Checked the device drivers		
6. checked application Programs		
7. Ran system utilities		
8. Printed successfully		

9. Attached the printer and power cable properly		
10. Observed Safety precautions are carefully.		



Information sheet 1.2-9

Disassembling & Assembling Computer System

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able disassemble and assemble computer system.

Introduction

- Computer assembly is a large part of a technician's job.
- Work in a logical, methodical manner when working with computer components
- Improve computer assembly skills dramatically with practice



Open the Case

- Prepare the workspace before opening the computer case:
 - Adequate lighting
 - Good ventilation
 - Comfortable room temperature
 - Workbench accessible from all sides
 - Avoid cluttering workbench
 - An antistatic mat on the table
 - Small containers to hold screws and other small parts
- There are different methods for opening cases. To learn how, consult the user manual or manufacturer's website.



Install the Power Supply

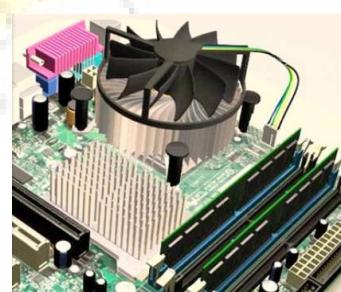
Power supply installation steps include the following:

1. Insert the power supply into the case
2. Align the holes in the power supply with the holes in the case
3. Secure the power supply to the case using the screws



Attach Components to the Motherboard

- As part of an upgrade or repair, a technician to attach components to the motherboard, and install the motherboard.



CPU on Motherboard

- The CPU and motherboard are sensitive to electrostatic discharge so use a grounded antistatic mat and wear an antistatic wrist strap. CAUTION: When handling a CPU, do not touch the CPU contacts.
- The CPU is secured to the socket on the motherboard with a locking assembly.



Thermal Compound

- Thermal compound helps to keep the CPU cool.
- To install a used CPU, clean it and the base of the heat sink with isopropyl alcohol to remove the old thermal compound.
- Follow manufacturer's recommendations about applying the thermal compound.



Heat Sink/Fan Assembly

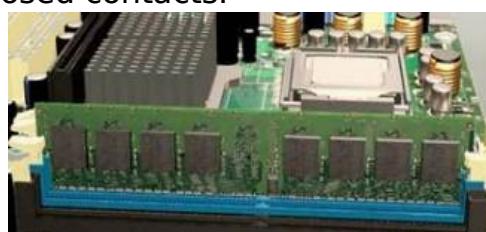
- The Heat Sink/Fan Assembly is a two-part cooling device.
- The heat sink draws heat away from the CPU.
- The fan moves the heat away from the heat sink.
- The heat sink/fan assembly usually has a 3-pin power connector.

Install CPU and Heat Sink/Fan Assembly

1. Align the CPU so that the Connection 1 indicator is lined up with Pin 1 on the CPU socket.
2. Place the CPU gently into the socket.
3. Close the CPU load plate and secure it by closing the load lever and moving it under the load lever retention tab.
4. Apply a small amount of thermal compound to the CPU and spread it evenly. Follow the application instructions provided by the manufacturer.
5. Line up the heat sink/fan assembly retainers to the holes on the motherboard.
6. Place the heat sink/fan assembly onto the CPU socket, being careful not to pinch the CPU fan wires.
7. Tighten the heat sink/fan assembly retainers to secure the assembly in place.
8. Connect the heat sink/fan assembly power cable to the header on the motherboard.

Install RAM

- **RAM** provides temporary data storage for the CPU while the computer is operating.
- RAM should be installed in the motherboard before the motherboard is placed in the computer case.
- RAM installation steps:
 1. Align the notches on the RAM module to the keys in the slot and press down until the side tabs click into place.
 2. Make sure that the side tabs have locked the RAM module and visually check for exposed contacts.



The Motherboard

- The motherboard is now ready to install in the computer case.

- Plastic and metal standoffs are used to mount the motherboard and to prevent it from touching the metal portions of the case.
- Install only the standoffs that align with the holes in the motherboard.
- Installing any additional standoffs may prevent the motherboard from being seated properly in the computer case.

Install Motherboard

1. Install standoffs in the computer case.
2. Align the I/O connectors on the back of the motherboard with the openings in the back of the case.
3. Align the screw holes of the motherboard with the standoffs.
4. Insert all of the motherboard screws.
5. Tighten all of the motherboard screws.



motherboard
with the

Install Internal Drives

- Drives that are installed in internal bays are called internal drives.
- A hard disk drive (HDD) is an example of an internal drive.
- HDD installation steps:
 1. Position the HDD so that it aligns with the 3.5-inch drive bay.
 2. Insert the HDD into the drive bay so that the holes in the drive line up with the screw holes in the case.
 3. Secure the HDD to the case using the proper screws.



internal
drive.
inch
screw
the
screws.

Install Drives in External Bays

- Drives, such as optical drives (CD and DVD) and floppy drives, are installed in drive bays that are accessed from the front of the case.
- Optical drives and floppy drives store data on removable media.
- Drives in external bays allow access to the media without opening the case.



drives, are
of the case.
removable
without

Install Optical Drive

- An optical drive is a storage device that reads and writes information to CDs or DVDs.
- Optical drive installation steps:
 1. Position the optical drive to align with the 5.25 inch drive bay.
 2. Insert the optical drive into the drive bay so that the optical drive screw holes align with the screw holes in the case.
 3. Secure the optical drive to the case using the proper screws.



Install Floppy Drive

- A floppy disk drive (FDD) is a storage device that reads and writes information to a floppy disk.
- FDD installation steps:
 1. Position the FDD so that it aligns with the 3.5 inch drive bay.
 2. Insert the FDD into the drive bay so that the FDD screw holes align with the screw holes in the case.
 3. Secure the FDD to the case using the proper screws.



Install Adapter Cards

- Adapter cards are installed to add functionality to a computer.
- Adapter cards must be compatible with the expansion slot.
- Some adapter cards:
 1. PCIe x1 NIC
 2. PCI Wireless NIC
 3. PCIe x16 video adapter



a computer.
expansion slot.
card

Install the Network

Card (NIC)

- A NIC enables a computer to connect to a network.
- NICs use PCI and PCIe expansion slots on the motherboard.
- NIC installation steps:
 1. Align the NIC to the appropriate slot on the motherboard.
 2. Press down gently on the NIC until the card is seated.
 3. Secure the NIC PC mounting bracket to the case with the appropriate screw.



1. Align the NIC to the appropriate slot on the motherboard.
2. Press down gently on the NIC until the card is seated.
3. Secure the NIC PC mounting bracket to the case with the appropriate screw.

Interface

- A wireless NIC enables a computer to connect to a wireless network.
- Some wireless NICs are installed externally with a USB connector.
- Wireless NIC installation steps:

Install the Wireless NIC

A wireless NIC enables a

1. Align the wireless NIC to the appropriate slot on the motherboard.
2. Press down gently on the wireless NIC until the card is fully seated.
3. Secure the mounting bracket to the case with the appropriate screw.



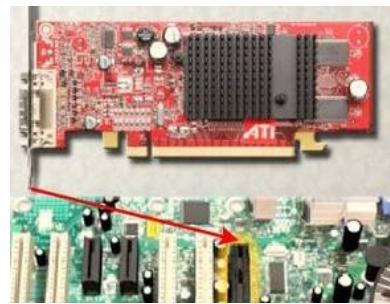
computer

expansion

Install the Video Adapter Card

- A video adapter card is the interface between a computer and a display monitor.

- An upgraded video adapter card can provide graphic capabilities for games and graphic programs.
- Video adapter card installation steps:
 1. Align the video adapter card to the appropriate expansion slot on the motherboard.
 2. Press down gently on the video adapter card until the card is fully seated.
 3. Secure the video adapter card PC mounting bracket to the case with the appropriate screw.



better

Connect Internal Cables

- Power cables are used to distribute electricity from the supply to the motherboard and other components.
- Data cables transmit data between the motherboard and devices, such as hard drives.
- Additional cables connect the buttons and link lights on of the computer case to the motherboard.



power
storage
the front

power
or 6-pin
connects

Connect Power Cables

Motherboard Power Connections

- The Advanced Technology Extended (ATX) main connector has either 20 or 24 pins.
- The power supply may also have a 4-pin Auxiliary (**AUX**) power connector that to the motherboard.
- A 20-pin connector will work in a motherboard with a 24-pin socket.



Connect Power Cables



SATA



4-

- ATA Power Connectors use a 15-pin connector to connect to hard disk drives, optical drives, or any devices that have a power socket.
- Molex Power Connectors are used by hard disk and optical drives that do not have SATA power
 - CAUTION: Do not use a Molex connector SATA power connector on the same drive at the time.
- 4-pin Berg Power Connector supplies power to a floppy drive.



Molex

Power Connector Installation Steps

1. Plug the SATA power connector into the HDD.
2. Plug the Molex power connector into the optical drive.
3. Plug the 4-pin Berg power connector into the FDD.
4. Connect the 3-pin fan power connector into the appropriate fan header on the motherboard, according to the motherboard manual.
5. Plug the additional cables from the case into the appropriate connectors according to the motherboard manual.

PATA Cables

- Drives connect to the motherboard using data cables.
- Types of data cables are PATA, SATA, and floppy disk.
- The PATA cable (sometimes called a ribbon cable) is wide and flat and can have either 40 or 80 conductors.
- A PATA cable usually has three 40-pin connectors.
- If multiple hard drives are installed, drive will connect to the end slave drive will connect to the middle
- Many motherboards have two PATA which provides support for a maximum of four PATA drives.



the master connector. The connector. cable sockets, maximum of

SATA Cables

- The **SATA** data cable has a 7-pin connector.
- One end of the cable is connected to the motherboard.
- The other end is connected to any drive that has a SATA data connector.



- Floppy Drive Cables
- The floppy drive data cable has a 34-pin connector and it has a stripe to denote the location of pin 1.
- One connector at the end of the cable connects to the motherboard. The other two connectors connect to drives.
- If multiple floppy drives are installed, the A: drive will connect to the end connector. The B: drive will connect to the middle connector.
- Motherboards have one floppy drive controller which provides support for a maximum of two floppy drives.

Install Data Cables

1. Plug the motherboard end of the PATA cable into the motherboard socket.
2. Plug the connector at the far end of the PATA cable into the optical drive.
3. Plug one end of the SATA cable into the motherboard socket.
4. Plug the other end of the SATA cable into the HDD.
5. Plug the motherboard end of the FDD cable into the motherboard socket.
6. Plug the connector at the far end of the FDD cable into the floppy drive.

Re-attach Panels, Connect External Cables

- Now that all the internal components have been installed and connected to the motherboard and power supply, the side panels are re-attached to the computer case.

- The next step is to connect the cables for all computer peripherals and the power cable.



Re-attach Side Panels

- Most computer cases have two panels, one on each side.
- Once the cover is in place, make sure that it is secured at all screw locations.
- Refer to the documentation or manufacturer's website if you are unsure about how to remove or replace your computer case.

CAUTION: Handle case parts with care. Some computer case covers have sharp or jagged edges.

Connect External Cables

- After the case panels have been re-attached, connect the external cables to the back of the computer.
- External cable connections include:

Monitor	USB
Keyboard	Power
Mouse	Ethernet

CAUTION: When attaching cables, never force a

NOTE: Plug in the power cable after you have connected all

Connect External Cables

- Attach the monitor cable to the video port.
- Secure the cable by tightening the screws on the
- Plug the keyboard cable into the PS/2 keyboard port.
- Plug the mouse cable into the PS/2 mouse port.
- Plug the USB cable into a USB port.
- Plug the network cable into the network port.
- Connect the wireless antenna to the antenna
- Plug the power cable into the power supply.



connection.

connected all

connector.

connector.

Boot Computer for the First Time

- The BIOS is a set of instructions stored in a nonvolatile memory chip.
- When the computer is booted, the basic input/output system (BIOS) will perform a power-on self test (POST) to check on all of the internal components.

```
Copyright 1996-2002  
SWV25.86B.0094.P01.021111021  
SWV2 Production BIOS Version 1.00  
BIOS Build 0094  
  
2 X Intel(R) Xeon(TM) CPU 2.00GHz  
Testing system memory, memory size=1024MB  
1024MB Extended Memory Passed  
512K L2 Cache SRAM Passed  
  
USB Legacy ..... Enabled
```

- A special key or combination of keys on the keyboard is used to enter the BIOS setup program.
- The BIOS setup program displays information about all of the components in the computer.

Identify Beep Codes

- POST checks to see that all of the hardware in the computer is operating correctly.
- If a device is malfunctioning, an error or a beep code alerts the technician that there is a problem.
- Typically, a single beep denotes that the computer is functioning properly.
- If there is a hardware problem, the computer may emit a series of beeps.
- Each BIOS manufacturer uses different codes to indicate hardware problems.
- Consult the motherboard documentation to view beep codes for your computer.

BIOS Setup

- The BIOS contains a setup program used to configure settings for hardware devices.
- The configuration data is saved to a special memory chip called a complementary metal-oxide semiconductor (**CMOS**).
- CMOS is maintained by the battery in the computer.
- If this battery dies, all BIOS setup configuration data will be lost.
- Replace the battery and reconfigure the BIOS settings.

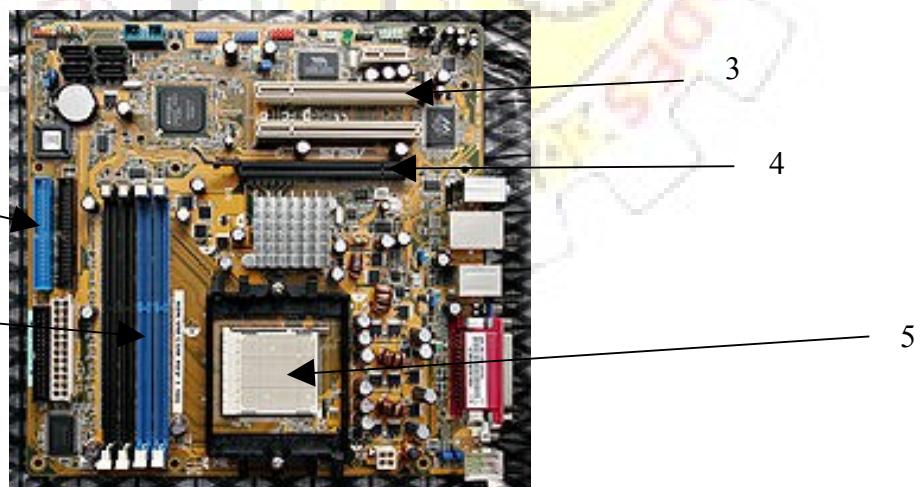
BIOS Setup Program

BIOS settings are configured in the BIOS setup program.



Self Checked 1.2-9

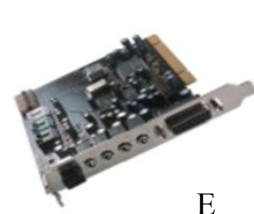
Match the PC Components to its proper location in the motherboard.



A



D



B



C

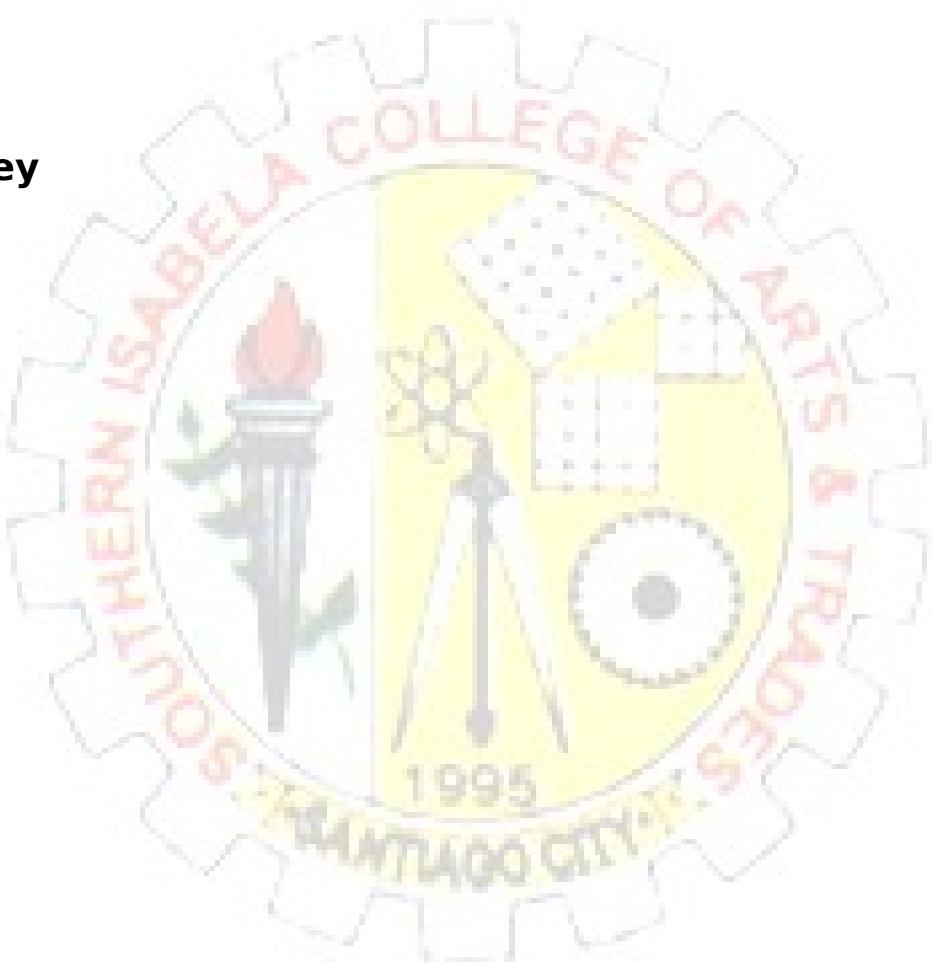


E



Answer Key

1. C
2. B
3. E
4. D
5. A



JOB SHEET 1.2-2

Title	: PC Disassembly and Assembly
Performance Objective	: Given personal computer you are going to disassemble & assemble the unit within 30 minutes.
Supplies, Tools and Materials:	
Equipment	: A working PC.
Steps/ Procedure:	
1. Confirm that the hardware works...	
- Does your video monitor work? Does your PC boot? Do your floppy drive and CD/DVD drive work? Does the hard drive work? Do the keyboard and mouse functioning?	
2. Turn OFF the system. NOTE : read this in its entirety before you begin	
1. Discharge yourself of all static electricity by touching the PC's chassis (or the ground screw on the receptacle.) 2. Safety NOTE!! Beware of sharp edges!!! The cheaper chassis have very sharp edges that can cut you easily. Be very careful and take your time. Remember, SAFETY FIRST. 3. As you remove each board and disk drive, document the information listed in the attached Specifications document (note some parts of the spec sheets wont apply to this lab).	
3. Disassemble the Unit	
Remove the External I/O Systems:	
1. Unplug all power cords, from the commercial outlet 2. Remove all peripherals from the system unit.	

3. Disconnect the keyboard from the rear of the unit.
4. Disconnect the monitor power cable.
5. Disconnect the monitor signal cable (video cable) from the video adapter card.

Do the following for each card and drive removed:

- Before removing a card, document any cables that are attached to the card, noting where they go and their orientation.
- Store screws properly.
- Note the position of the colour strip (pin no. 1) on the cables and make a mark for the pin no.1 if needed on the I/O card or Motherboard and on the Floppy and the hard drive.

Remove the Storage Devices in the System Unit:

6. Remove the floppy drive.
7. Remove the hard drive.

Remove the Interface Cards (Adapter Cards):

8. Remove the video card from the expansion slot.
9. Remove other interface cards if exists.

- draw a picture of the card. The drawing should accurately show-->
 - the shape of the board,
 - the connectors on the board, including the card edge connector,
 - the number of pins on connectors,
 - all jumpers and the jumper settings.
 - label the board with any identification that appears on the card (chip sets or manufacturer stamps, BIOS stamps, etc....).

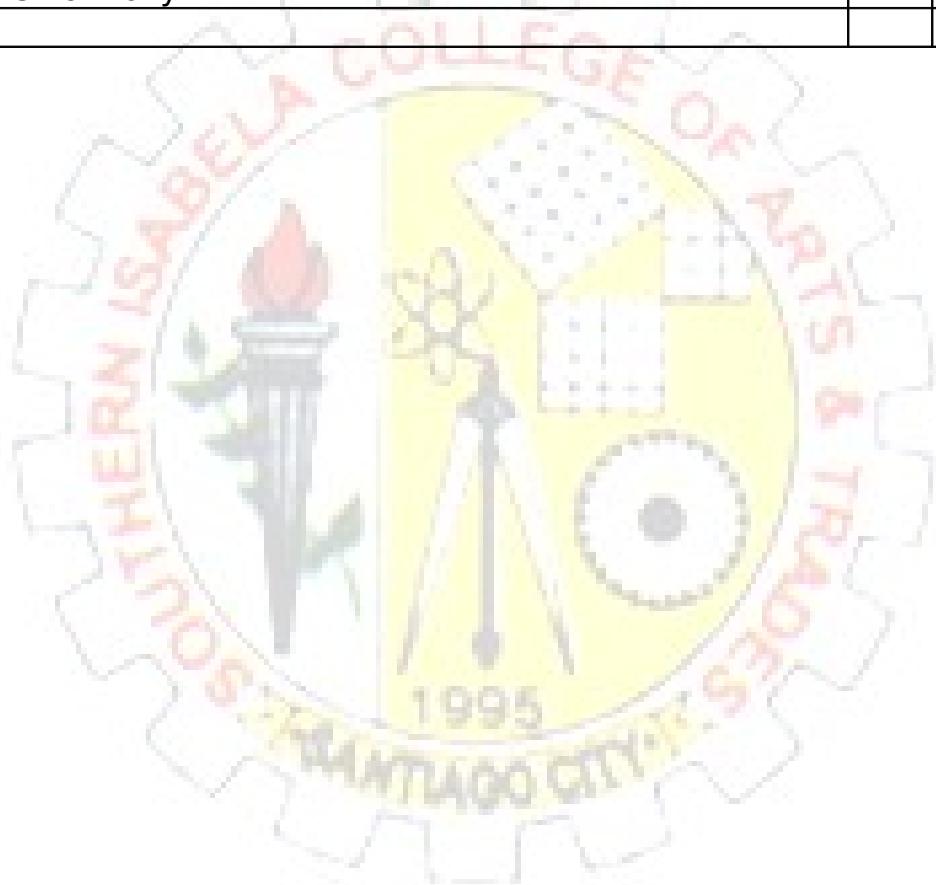
2. Assemble the PC
 - To assemble the PC, reverse the procedure above or follow the procedures in the information sheet "Disassembling & Assembling PC."

Assessment Method:

Demonstration, Performance Criteria checklist

Performance Criteria Checklist

CRITERIA	Ye s	No
Did you...		
Followed Safety procedures		
Checked Hardware functionality		
Observed safety used of tools and equipment in accordance with the manufacturer's instruction		
Checked PPE condition in accordance with the manufacturer's instruction		
Disassembled the unit properly		
Removed the external I/O system		
Removed the storage devices in the system		
Removed interface cards		
Followed the correct procedures in Assembling the PC		
Booted the PC normally		



LEARNING OUTCOME SUMMARY

LEARNING OUTCOME 3	Conduct validation and testing
CONTENTS:	
1. Testing Procedures 2. Cable Troubleshooting 3. Diagnostic Software 4. Device Drivers 5. Installation of Peripheral Devices	
ASSESSMENT CRITERIA:	
1. OH&S policies are strictly followed resulting to no lost time injury. 2. Specified testing procedures for circuit and system are carried out. 3. Installed devices/systems are protected against loss/damage in accordance with established standard 4. Approval is obtained before any validation or testing is employed. 5. Installation proceedings, devices/systems test conforms with specified requirements. 6. Every device system noticed to cause malfunction of the system is removed, tested and returned to pretest condition in accordance with the established procedures. 7. Final inspection, testing and validation are undertaken to ensure quality performance of the system. 8. Documentation of the performed job is submitted to a laboratory teacher following the format given.	
CONDITION: Trainees must be provided with the following:	
<ul style="list-style-type: none">• WORKPLACE LOCATION• Tools, Materials and Equipment and Facilities• Computer Table and Chairs• Computers• Printers• Installation CDs• And other Computer Accessories	
References: <ul style="list-style-type: none">• Andres Sr., Antonio M. Introduction of Computer. Fully Illustrated, Valenzuela City; May 2003 World Class Publishing and Packaging• Sto. Domingo, Josephine C., Learning Windows XP and Internet the Easy Way Computers - The Easy Way	
EVALUATION METHOD: <ul style="list-style-type: none">• Demonstration & Oral Questioning• Written Test	

Learning Experiences

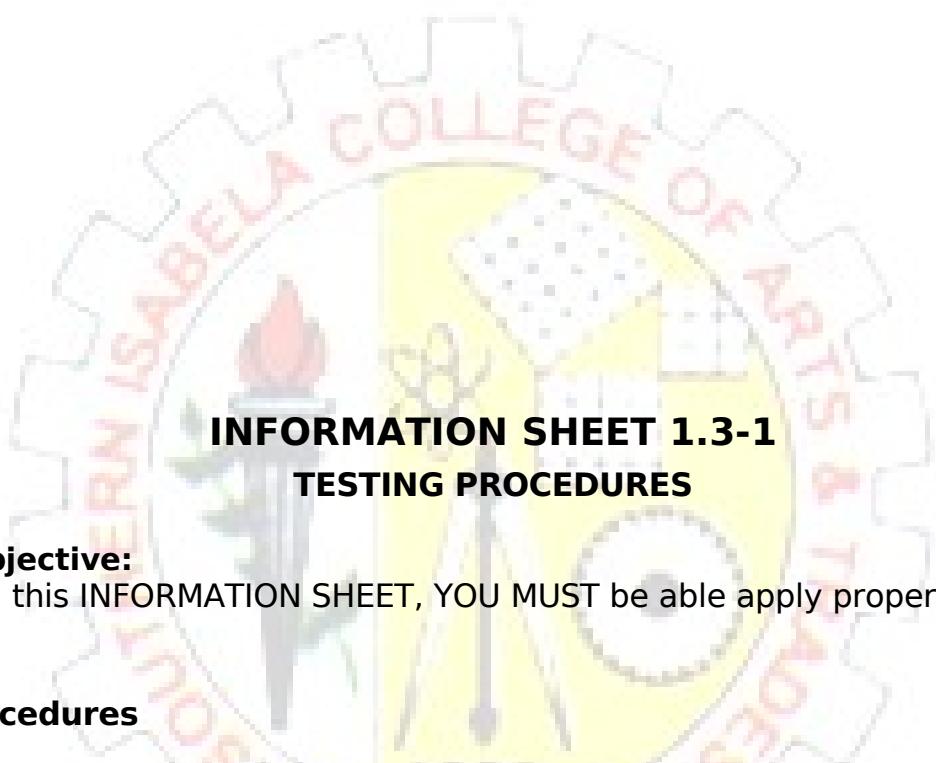
Learning Outcome 3

Conduct Validation and Testing

Learning Activities	Special Instructions
Read information sheet 1.3-1 " Testing Procedures "	If you have some problem on the content of the information sheet

	<p>don't hesitate to approach your facilitator.</p> <p>If you feel that you are now knowledgeable on the content of the information sheet, you can answer self check provided in the module.</p>
Answer self-check 1.3-1	<p>Compare your answer to the answer key 1.3-1. If you got 100% correct answer in this self-check, you can now move to the next information sheet. If not review the information sheet and go over the self-check again.</p>
Read information sheet 1.3-2 “Cable Troubleshooting”	<p>If you have some problem on the content of the information sheet don't hesitate to approach your facilitator.</p> <p>If you feel that you are now knowledgeable on the content of the information sheet, you can now do operation sheet 1.3-2 provided in the module.</p>
4. Answer self-check 1.3-2	<p>Compare your answer to the answer key 1.3-2. If you got 100% correct answer in this self-check, you can now do task sheet 1.3-1. If not review the information sheet and go over the self-check again.</p>
Do Task Sheet 1.3-1 “Cable Troubleshooting”	<p>Compare your work to the checklist and let your trainer check it. If you got 100% correct answer in this task, you can now move to the next information sheet. If not review the information sheet and go over the task again.</p>
Read information sheet 1.3-3 “Diagnostic Software”	<p>If you have some problem on the content of the information sheet don't hesitate to approach your facilitator.</p> <p>If you feel that you are now knowledgeable on the content of the information sheet, you can now answer self check provided in the module.</p>
Answer self-check 1.3-3	<p>Compare your answer to the answer key 1.3-3. If you got 100% correct answer in this self-check, you can now move to the next Information sheet. If not review the information sheet and go over the self-check again.</p>
Read information sheet 1.3-4	If you have some problem on the

“Device Drivers”	content of the information sheet don't hesitate to approach your facilitator. If you feel that you are now knowledgeable on the content of the information sheet, you can now Operation Sheet provided in the module.
9. Answer self-check 1.3-4	Compare your answer to the answer key 1.3-4. If you got 100% correct answer in this self-check, you can now Perform Task Sheet. If not review the information sheet and go over the self-check again.
Perform Task Sheet 1.3-2 Device Drivers	Compare your work to the Checklist & let your trainer check it. If you got 100% correct answer in this task, you can now move to the next Information sheet. If not review the information sheet and go over the self-check again.
Read information sheet 1.3-5 “Installation of Peripheral Devices”	If you have some problem on the content of the information sheet don't hesitate to approach your facilitator. If you feel that you are now knowledgeable on the content of the information sheet, you can now perform Operation Sheet provided in the module.
Answer self-check 1.3-5	Compare your answer to the answer key 1.3-5. If you got 100% correct answer in this self-check, you can now Perform Task Sheet. If not review the information sheet and go over the self-check again.
Perform Task Sheet 1.3-3 Installation of Peripherals, Network Devices and other I/O Devices	Compare your work to the Performance Checklist and let your trainer check it. If you got 100% correct answer in this task, you can now take the Competency Evaluation. If not review the information sheet and go over the task again.



INFORMATION SHEET 1.3-1

TESTING PROCEDURES

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able apply proper testing procedures.

Testing Procedures

- **Deciding When to Test the System.** Identify computer symptoms and defects
- **Preparing to Test the System .** It's recommended that you should not plug your computer and monitor directly to a wall outlet. Rather, you should purchase a UPS (uninterruptible power supply). The UPS serves as a surge protector to prevent your system from being damaged if a power spike is delivered to it and when power will fail unexpectedly. The UPS gives you time to save your work and properly shut down your system. If a system is turned off and back on rapidly, it's probably not good for the system. A very short power drop could mimic this effect and could be hard on both the computer and the monitor.

- **Powering Up the System for the First Time** . Examining the back of the PC case, we see that there is a switch with two positions, 0 and 1. Zero often means **off**, and one often means **on** in the computer world. We turn the switch from 0 to 1 and push the power button again
- **Adjusting BIOS Settings** . To enter BIOS setup, a key, such as delete, is usually pressed when the system first starts up. Consult your main board manual if you want to learn more about BIOS setup.
- **Replacing the Side of the Case and Bezel** . Now that your system is tested and we've visually seen that the CPU fan is spinning properly, we can shut down the system and replace the side of the



This case side must be pushed toward the back of the case to engage lugs on the case. Before closing the case, be sure no wires or cables are near the edges where they might get pinched.



Screwing in the side of the case

Some cheaper cases have poorly tapped threads for the screws, so use only minimal force to tighten the cover screws.



Closing the bezel

Here the lip of the bezel hits the CD-RW drive and we need to gently lift up the CD drive to close the bezel. Don't just slam the bezel to close it. Close it gently to be sure nothing interferes with it closing.

It also saves wear and tear if you depress the front cover latch as you close it.. Tilt the front of the case upward to get a good grip on the latch.



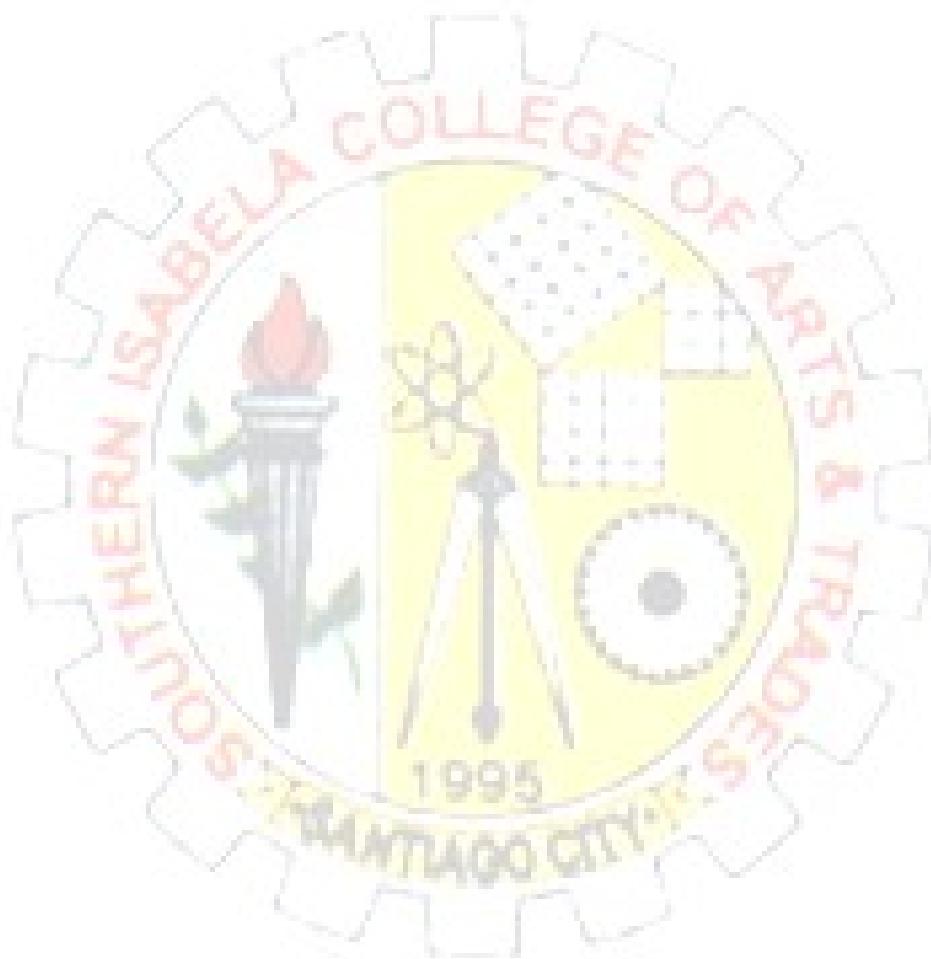
Back of the side panel

If you have difficulty replacing the side of your case, examine it carefully to see how the lugs engage the rest of the case.

SELF-CHECK 1.3-1

SEQUENCING. Arrange the following Testing Procedures in their proper order by writing A for the first, B for the second, and so on down to the last.

- 1. Prepare to test the system.
- 2. Powering Up the System for the First Time
- 3. Deciding When to Test the System
- 4. Replacing the Side of the Case and Bezel
- 5. Adjusting BIOS Settings



ANSWER KEY

- 2. B
- 3. C
- 4. A
- 5. E
- 6. D

INFORMATION SHEET 1.3-2

Cable Troubleshooting

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to troubleshoot Network Cable.

Cable Trouble Shooting

Knowing simple troubleshooting techniques may help you correct some situations and continue working. The main factors to keep in mind when troubleshooting are: do not panic, take a common sense approach, and work from general to specific when addressing the problem.

A series of troubleshooting tips are listed below.

Hardware

Make sure that the power cable is plugged in.

Some computer systems have several power cables, often one for each component. Check each one and make sure that the plug is completely plugged in.



Be sure that all cables are connected.

Computer systems usually have several cables associated with them that are used to connect the peripherals to the main system. Check both ends of the cables and make sure they are plugged in securely and plugged into the correct location.

See to it that all components are switched on.

Most systems have components and peripherals attached to them and quite often each one has its own power switch. All components must be switched on if communication is to be established between them.

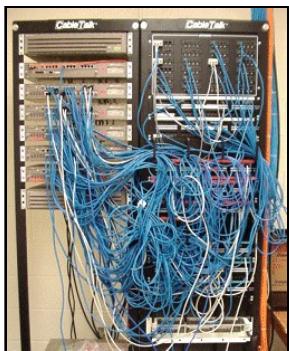
The keyboard and mouse cables are snugly connected to their ports.

The keyboard and mouse are moved every time the computer is used they can work themselves loose over time. Check their connections.

Watch out for power outages or electrical storms.

Power outages and lightening strikes can damage your system. If lightning has damaged your system, you very likely have a serious problem with some component in the system. This is a good time to ask for assistance from someone who deals with these types of problems on a regular basis. A UPS (uninterruptible power supply) should prevent any damage from power outages and will also provide some protection from lightning. But remember, nothing stops a direct lightning hit. The best protection is to

completely unplug the system from electrical outlets and unplug the modem connection.



Check if the network is operating and that the phone line is valid.

If your computer is not communicating, check the phone line or network cable for a good connection. If you have a dialup connection, pick up the phone and listen for a dial tone. If you are connected to a network, contact your network administrator.

Shutdown the system down and restart.

One of the great (and often frustrating) properties about computers is that in many cases just turning the system off, waiting a minute and then turning it back on will correct the problem.

Ask for assistance.

Your computer system is a significant investment and an important tool. Do not let your pride keep you from asking for help when you need it. If you are not sure ask!

SELF CHECK 1.3-2

TRUE OR FALSE: Write T if the statement is True and F if the statement is False.

It is not necessary to check if all the cables are connected.

See to it that all components are switched on.

Power outages and lightning strikes can't damage your system.

If your computer is not communicating, check the phone line or network cable for good connection.

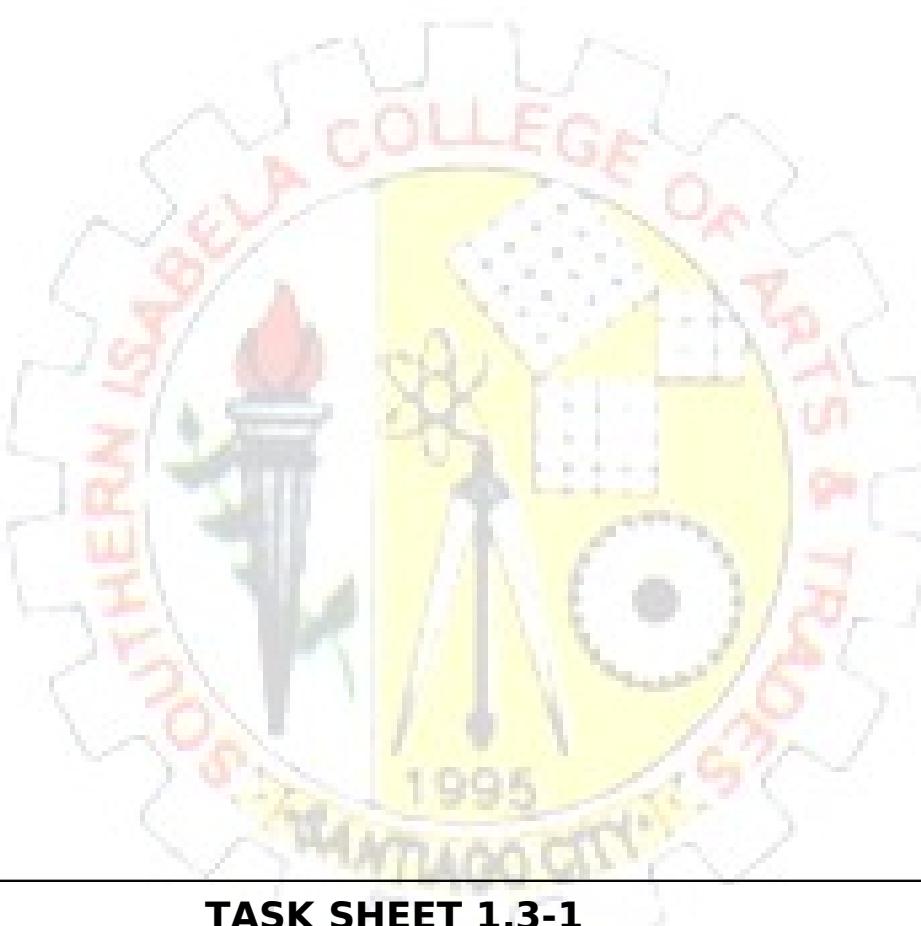
Do not let your pride keep you from asking for help when you need it.



Answer Keys

1. F
2. T
3. F
4. T

5. T



TASK SHEET 1.3-1

Title	: Cable Testing / Troubleshooting
Performance Objective	: At the end of the operation you are going to perform cable testing and trouble shooting.
Supplies , Tools & Materials	: Computer Unit, Automatic Voltage Regulator (AVR), Power Cable, LAN Tester, PPE.
Equipment	: Functional Computer
Steps/ Procedure:	
1. Prepare materials & Tools needed 2. Follow the procedures from the information sheet 1.3-2 on how to test and troubleshoot Network Cable. 3. Let your Trainer check your work.	

Assessment Method:

Demonstration, Performance Criteria checklist

PERFORMANCE CHECKLIST

Did you...	Performance Criteria	
	YES	NO
1. Plugged the power cable properly.		
2. Connected the AVR to the Power source properly.		
3. Observed safety precautions carefully.		
4. Checked the fuse and the switch carefully.		
5. Replaced defective devices successfully.		
6. Checked and tested network cable.		
Used testing instruments properly.		
Apply Occupational health & safety procedures		

INFORMATION SHEET 1.3-3

Diagnostic Software

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to Identify and used diagnostic software.

Diagnostic Software

The purpose of diagnostic software is simple: to test drives and diagnose potential problems. These programs usually come with retail drives on a floppy disk, or can be downloaded from the manufacturer's web site. In some cases a single program will function for any of the manufacturer's drives, but in other cases a different program is needed depending on the drive model.

If you suspect a problem with your hard disk, you should always run a diagnostic program to check the status of the drive.

The following are the common diagnostic software .

- **Power-On Self Test (POST):** It is built into system BIOS and it runs every time you start up your PC automatically. It is often the best indicator of system problems.
- **MEM.EXE:** This simple utility, built into recent versions of DOS and also Windows 95, provides with details about memory configuration, as well as what is currently using memory.
- **Microsoft Diagnostics:** Better known as "MSD.EXE", this is a small DOS utility that takes a brief inventory of the contents of a PC and shows them a text-based format. This is very useful for seeing what disks are in the system, how much memory is installed, and also for checking system resource usage such as LPT ports and IRQs. It will show what type of BIOS are using and also what UART chip have in the serial ports.
- **The Windows 95 Device Manager:** This is the most useful tool for identifying system configuration and resource usage information under Windows 95.
- **Norton System Information:** This utility is similar to the Microsoft Diagnostics, SI shows a great deal of information about what is in the PC. This program is part of Symantec's Norton Utilities.
- **Microsoft ScanDisk and Norton Disk Doctor:** These programs are used to check for hard disk problems. This includes file system corruption and hard disk read errors. They should be used when hard disk problems are suspected.
- **Norton Diagnostics:** It includes tests of the processor and motherboard and system memory, and will identify some types of resource conflicts.

SELF-CHECK 1.3-3

Identification. Identify the correct Diagnostic tool or software stated below.
Use a separate sheet of paper in answering

1. This program includes file system corruption and hard disk read errors.
2. This is the most useful tool for identifying system configuration and resource usage information.
3. A Diagnostic Software often the best indicator of system problems
4. It includes tests of the processor and motherboard and system memory, and will identify some types of resource conflicts.
5. Known as "MSD.EXE" a small DOS utility that takes a brief inventory of the contents of a PC



ANSWER KEY # 1.3-3

1. Microsoft Scandisk and Norton Disk Doctor
2. The Windows 95 Device Manager
3. Power-On Self Test (POST)
4. Norton Diagnostic
5. Microsoft Diagnostic

INFORMATION SHEET 1.3-4

Device Drivers

Learning Objective:

After reading this INFORMATION SHEET, YOU MUST be able to install device drivers.

Introduction:

Now that you have an operating system installed, you'll need to install drivers for your devices such as Video Cards, Network Interface Cards, Sound Cards, etc. In many cases, if Windows recognizes the device, drivers will be installed automatically. In some cases, generic drivers are installed and they will work fine.

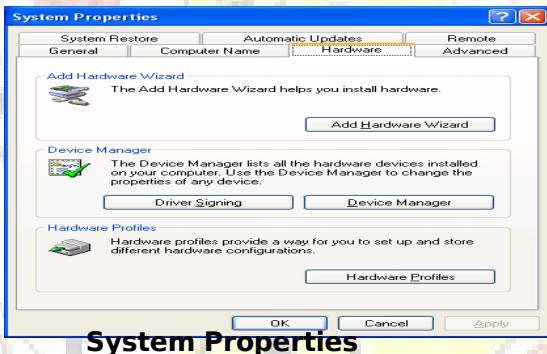
Drivers are small software programs that help the operating system use or "drive" the device. Whenever a device doesn't work properly, ask if the proper driver has been installed.

Driver Installation Example: Monitor Driver

Installing the proper monitor information files is one of the small things that purchasing a fully assembled PC

Default Monitor Driver

In the Control Panel, select System to open the System Properties dialog box. Then select "Device Manager" to get a list of hardware in the PC. Finally, click "Monitor," and you'll see that a generic monitor is listed.

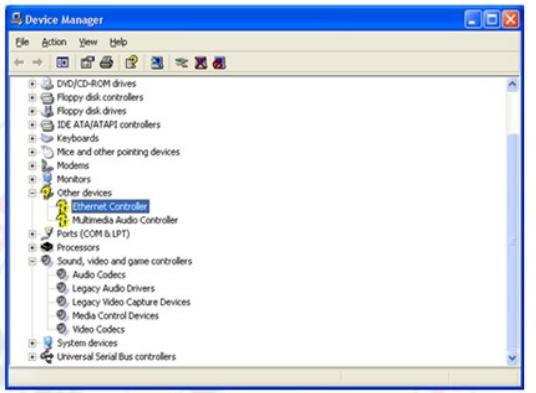


Installing a Sound Card Drivers

Once the sound card is installed, start the system and let the windows Plug and Play install the sound card's drivers. After your driver is installed, make a quick trip to Device Manager to make sure that the driver was installed correctly. . The Printer Install Wizard is perfectly installed

Installing Other Drivers

Proceed similarly to install drivers for your other devices, such as a sound card if you have one. Whenever a device doesn't seem to be working properly, ask if you've installed the proper device driver or if it's been done automatically. Looking for the device under Device Manager in Windows is a good way to see if the device driver is installed. As you can see in the figure below a question mark by Ethernet Controller in Device Manager shows that network drivers aren't yet installed.



Unrecognized Device

If your main board has built-in sound or networking, a CD that contains drivers probably came with the main board. Place the CD into the CD drive and let Windows XP search for the appropriate driver.

Other common drivers are LAN (Local Area Networking) driver, CD media driver, expansion cards, keyboards, printers, USB devices and others.

Self Check 1.3-4

TRUE OR FALSE: Write T if the statement is True and F if the statement is false.

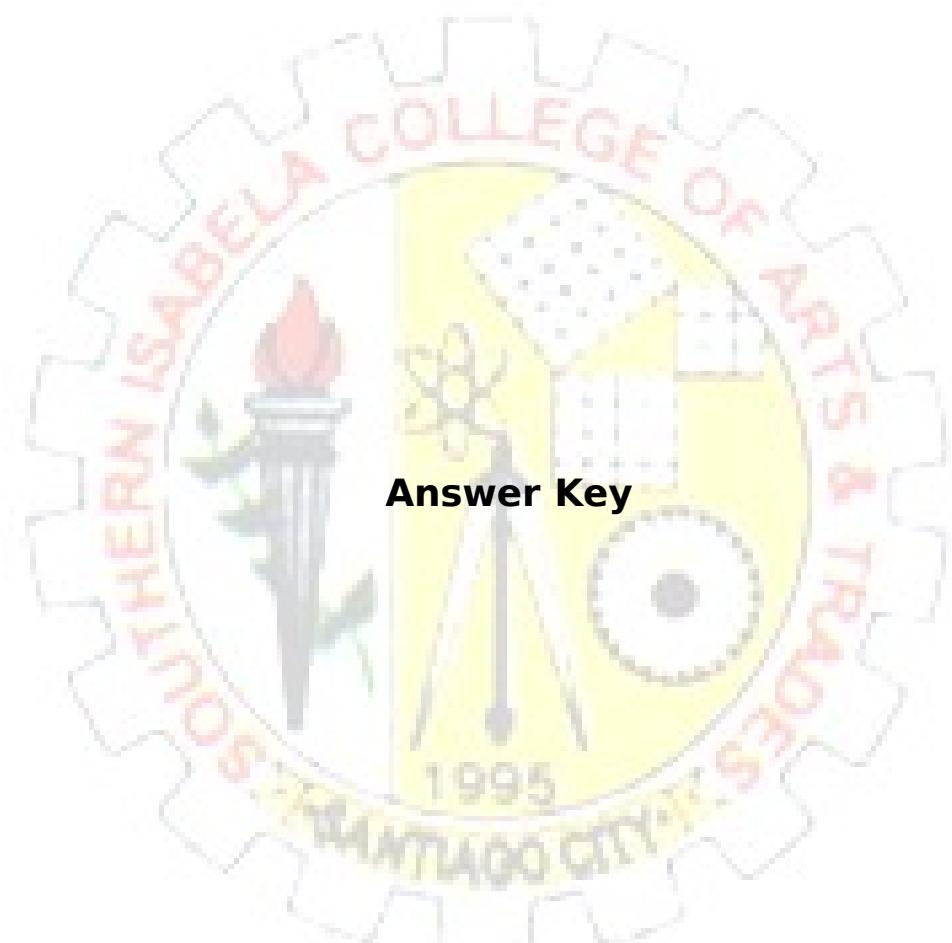
It is not necessary to install drivers for your computer

Drivers are small software program that help the operating system use or drive the device.

Installing the proper monitor information files is one of the small things in purchasing a fully assembled PC.

In windows XP, windows do not recognize the newly installed device.

If proper driver was not installed, the PC won't work properly.



Answer Key

1. F
2. T
3. T
4. F
5. T

TASK SHEET 1.3-2

Title	: Device Drivers
-------	------------------

Performance Objectives: At the end of the task the trainees are expected to Install all necessary drivers in the given personal computer.

Supplies, Tools, Material	: Installation CD
---------------------------	-------------------

Equipment	: Functional Computer w/peripherals
-----------	-------------------------------------

Steps/ Procedure:

Procedure in Bed Make Up

1. Prepare necessary tools & equipment.
2. Start computer
3. Check the needed drivers to be installed.
4. Insert the installation CD.
5. Install Necessary drivers

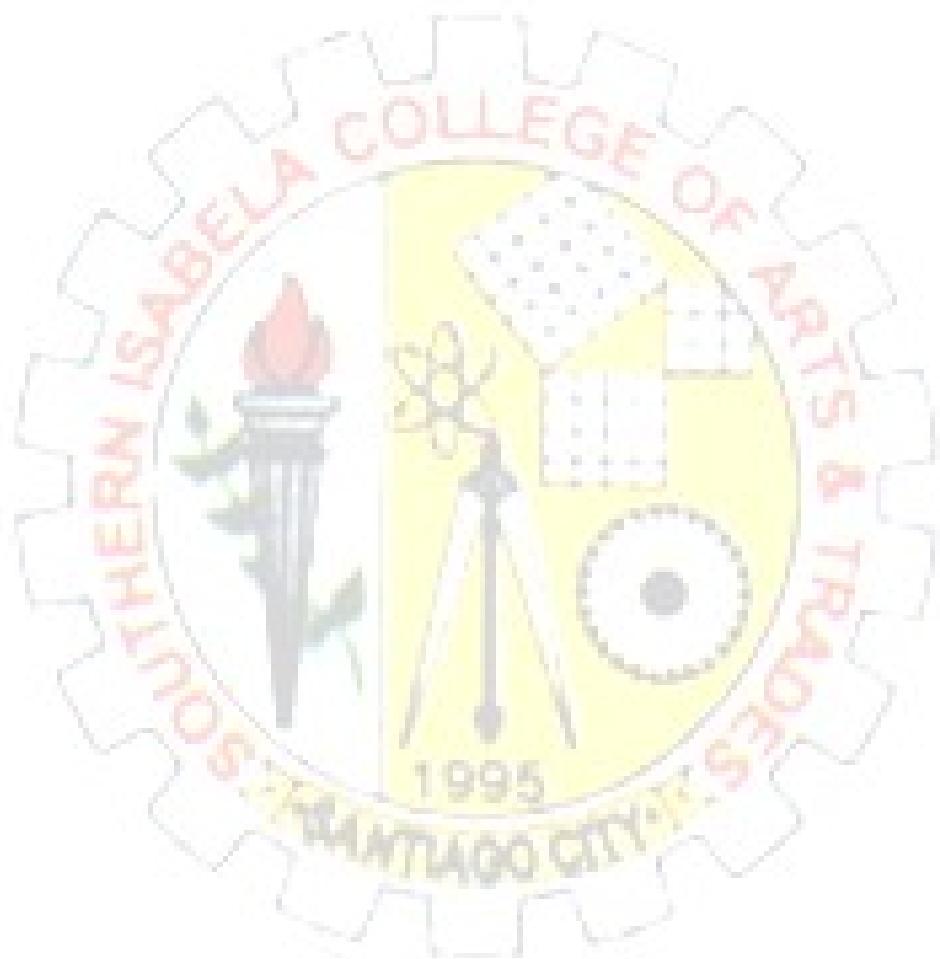
Assessment Method:

Demonstration , Performance Criteria checklist

PERFORMANCE CHECKLIST

Did you...	Performance Criteria		
		YES	NO

1. Started the system correctly.		
2. Inserted the Installation CD properly.		
3. Observed proper handling and safekeeping of installation CD.		
Followed the instructions on how to install device drivers.		
5. Installed the device drivers successfully		
6. Followed OHS procedures.		



INFORMATION SHEET 1.3-5

Installation of Peripheral Devices

Learning Objective:

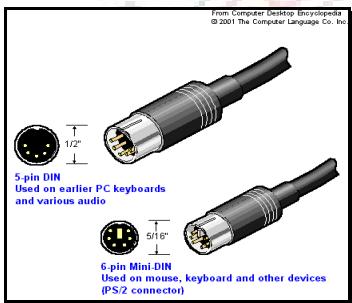
After reading this INFORMATION SHEET, YOU MUST be able to install different peripheral devices.

Installation Of Peripherals

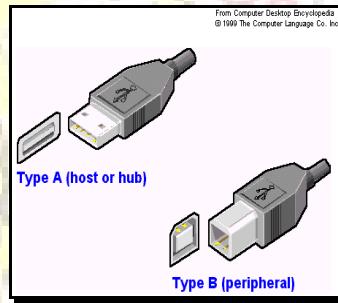
Note: If your computer doesn't have an operating system installed yet, you will want to stop after you install your mouse and keyboard, install your operating system, and then resume the installation of your peripherals

Installing the Keyboard

1. Read and follow the manufacturer's instructions
2. Determine if the keyboard uses a PS/2 or USB connector. The PS/2 connector for keyboards is round and typically colored purple, while the USB is flat and rectangular in shape.



PS/S CONNECTOR



USB CONNECTOR

Installing the keyboard by

3. plugging it into the chosen port.



Note: Do not install your keyboard while your Computer is powered on and do not unplug your keyboard while your computer is running.

Installing the Mouse

Installing a mouse is very similar to installing a keyboard. You will still find mice with either USB or PS/2 connectivity, although most of the newer mice will use a USB connection, especially if you are using a mouse for gaming. Just like the keyboard, you can also use an adapter to change a USB connection to PS/2. If you are going to have a lot of USB peripherals, you may want to consider using adapters for your mouse and keyboard or perhaps using a USB hub for some of your peripherals. To complete the installation, simply plug the mouse into the proper port.

Installing the Monitor

Installing a monitor (also known as a "display") requires

1. Provide a free power outlet for A/C power.
2. Identifying the connection type you will use to connect the monitor to your graphics card

3. For the best picture quality possible, use the digital DVI port on your graphics card and display if they are available. Most graphics cards now support multiple monitors and they typically include the adapters required to change a DVI connection to VGA for older displays.
4. Once you have the display plugged in, simply connect it to the appropriate connector on your video card and you are ready to go. Drivers are not typically required for displays, but once again consult the manufacturer's instructions for details.

Installing the Speakers

1. Determine the type of speakers you are using. Perform a simple set of 2.0 or 2.1 speakers.
2. Connect the audio cable to the "line-out" jack of your computer's sound card, and connect the other end(s) to the speaker unless they are already "hard-wired"
3. Plug in the power cord.
4. If you are using a full 5.1 or 7.1 surround sound system, the connections get a bit more complicated.
5. Read the instructions that came with the speakers and sound card for full details on this step. You can also find USB-powered speakers that have their own sound card built in and need only be connected to power.

Installing a Webcam

Most webcams are USB-powered and simply require that you plug them in and install their drivers. However, some cams require that the drivers be installed first, so be sure to read the instructions that came with your webcam to avoid any problems. If you bought a FireWire (a form of connection that is often faster than USB connections) webcam, ensure that your computer has a FireWire port because they are not yet all that common.

Installing the Printer

1. Make sure that you have an appropriate printer cable and, if necessary, a separate power cable.
2. Turn off your PC and install the USB or parallel cable between the printer and the PC.
3. Insert the ink cartridge or toner cartridge.
4. Plug in the printer and turn it on.
5. Reboot your PC.
6. Wait for Windows to see the new printer hardware and start the Printer Install Wizard.
7. If you have an Installation CD, cancel the Printer Install Wizard and allow it to auto play. Follow the instructions to install the printer driver.
8. After the printer has been installed, run a test print to verify that the printer is working properly.

Installing a Scanner

Installing a scanner is almost identical to installing your printer. Again, you will simply need to install the drivers and then plug the USB cable in the USB Port.



SELF CHECK 1.3-5

Arrange the procedures in proper order by putting A for the 1st step B for the second and so on.

Installing the Printer

Insert the ink cartridge or toner cartridge.

Make sure that you have an appropriate printer cable and, if necessary, a separate power cable.

Wait for Windows to see the new printer hardware and start the Printer Install Wizard.

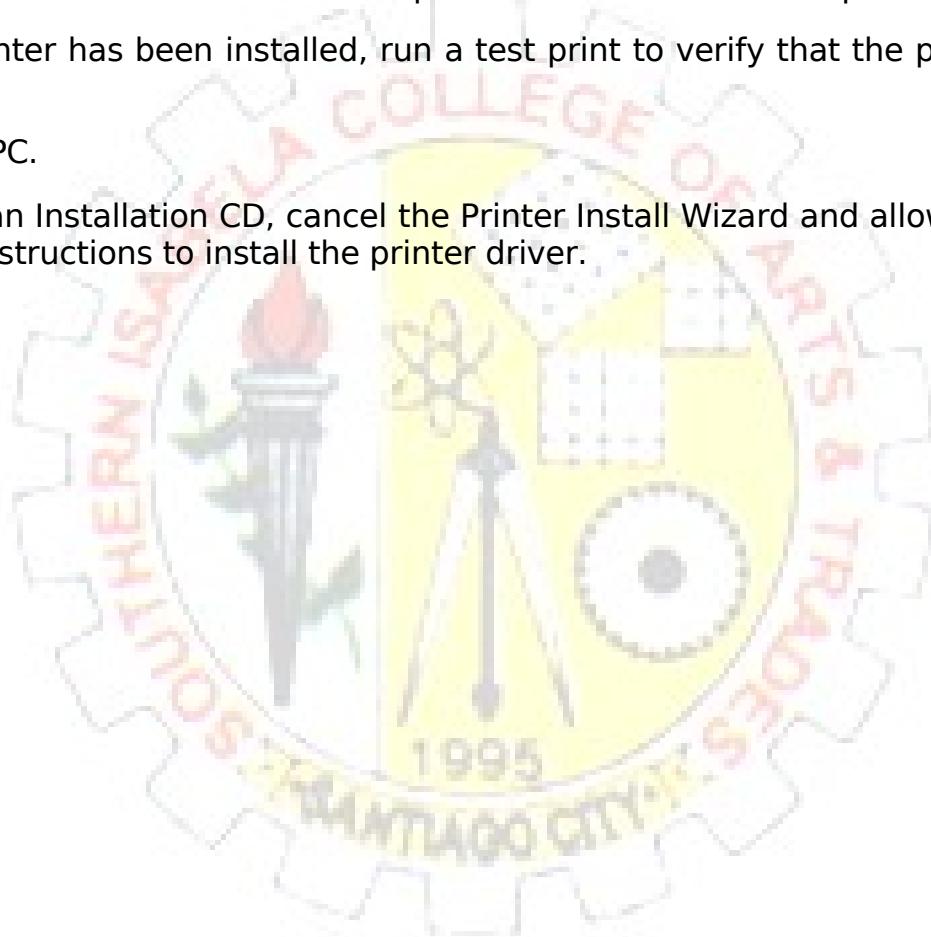
Plug in the printer and turn it on.

Turn off your PC and install the USB or parallel cable between the printer and the PC.

After the printer has been installed, run a test print to verify that the printer is working properly.

Reboot your PC.

If you have an Installation CD, cancel the Printer Install Wizard and allow it to auto play. Follow the instructions to install the printer driver.



Answer Key

1. C
2. A
3. F
4. D
5. B
6. H
7. E
8. G



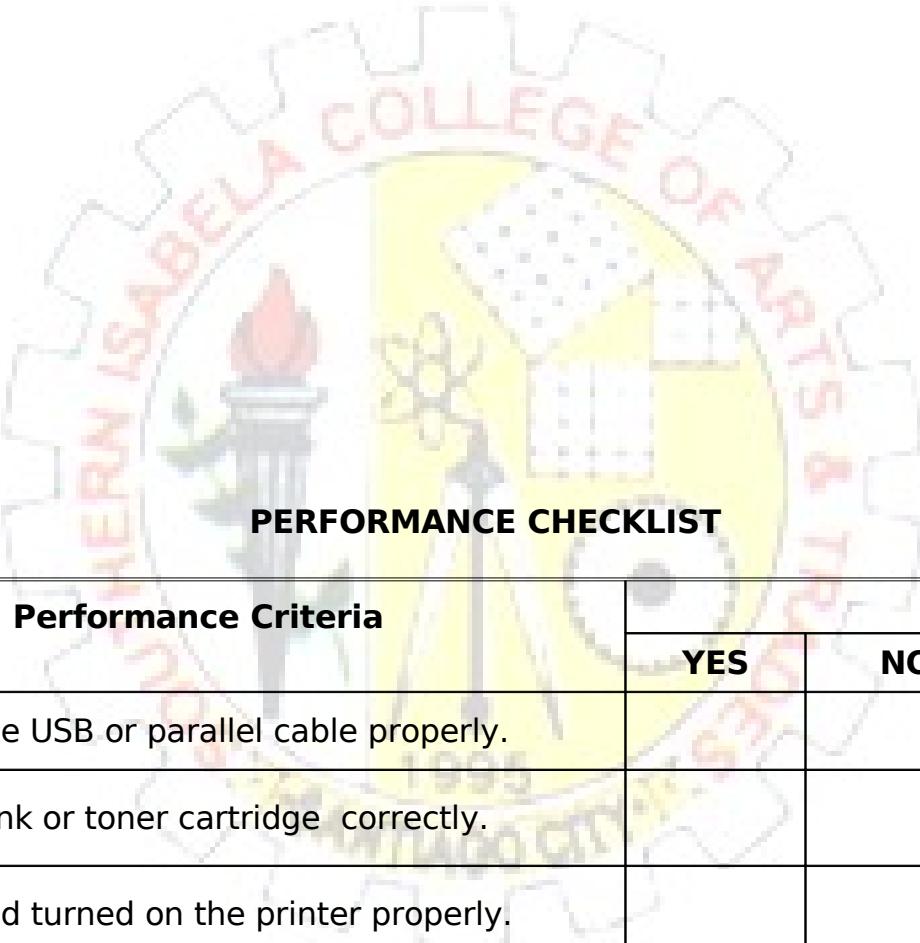
TASK SHEET 1.3-3

Title	: Installation of Peripherals, Network Devices and other I/O Devices
Performance Objectives: Given the necessary tools, materials and equipment, perform installation of a printer. Peripheral, network devices and other I/O Devices	
Tools, and Materials:	Documentation, and an installation CD, multi-media speaker, webcam and scanner
Equipment	: Window system without an installed printer, any type of printer with cables
Steps/ Procedure:	
1. Prepare the necessary tools and equipment 2. Start the computer. 3. Install printer 4. Install Speaker	

- | |
|---|
| <ul style="list-style-type: none"> 5. Install webcam 6. Install scanner 7. Install necessary drivers |
|---|

Assessment Method:

Demonstration, Performance Criteria checklist



PERFORMANCE CHECKLIST

Performance Criteria Did you...		
	YES	NO
1. Installed the USB or parallel cable properly.		
2. Inserted the ink or toner cartridge correctly.		
3. Plugged and turned on the printer properly.		
4. Rebooted the Personal Computer (PC).		
5. Perfectly installed the Printer using Install Wizard.		
Successfully made test print.		
Installed speaker		

Installed Scanner		
Installed Webcam		



INSTITUTIONAL EVALUATION

EVIDENCE PLAN

TRAINEES NAME			
FACILATATORS NAME			
QUALIFICATION	COMPUTER HARDWARE SERVICING NC II		
PROJECT-BASED ASSESSMENT	SERVICING COMPUTER SYSTEMS AND NETWORKS		
UNIT OF COMPETENCY COVERED	1. Install Computer Systems and Networks		
Ways in which evidence will be collected: <i>[tick the column]</i>		Demonstration	Written Test
The evidence must show that the candidate.....			Interview
Identify hazards & risks	X		
Maintain occupational health and safety awareness	X		
Assess quality of received materials	X		
Identify Computer Parts & Peripherals	X	x	
Prepare hand tolls	X		
Use appropriate hand tolls and test equipment	X		X
Plan and prepare for installation	X		
Install equipment /device system*	X	x	X
Disassemble and Assemble system unit using standard procedures*	X		
Install Operating System*	X		X
Install Necessary Drivers*	X		
Conduct test	X		X
Test systems and networks	X	x	X
Apply 5s before, during & after the task.	x		
Apply troubleshooting techniques	x		X

NOTE: *Critical aspects of competency

DEMONSTRATION WITH QUESTIONING CHECKLIST

TRAINEE'S NAME	
TRAINER'S NAME	
QUALIFICATION	COMPUTER HARDWARE SERVICING NC II

UNIT OF COMPETENCY COVERED	1. Install Computer Systems and Networks					
DATE OF EVALUATION						
TIME OF EVALUATION						
INSTRUCTIONS FOR DEMONSTRATION						
Given the necessary materials, tools and equipment, the trainee must be able to perform the following within four (4) hours						
<ul style="list-style-type: none"> • Install Computer Systems and Networks 						
Materials & Equipment						
Observation:	/ to show if evidence is demonstrated					
	Yes	No	N/A			
Identify hazards & risks						
Maintain occupational health and safety awareness						
Assess quality of received materials						
Identify Computer Parts & Peripherals						
Prepare hand tolls						
Use appropriate hand tolls and test equipment						
Plan and prepare for installation						
Install equipment /device system*						
Disassemble and Assemble system unit using standard procedures*						
Install Operating System*						
Install Necessary Drivers*						
Conduct test						
Test systems and networks						
Apply 5s before, during & after the task.						
Apply troubleshooting techniques						

INTERVIEW QUESTION CHECKLIST

QUESTIONS	Satisfactory response	
	YES	NO
You are preparing a computer for a dual-booting between Windows 98 and XP. Your drives is partitioned, and Windows 98 is already installed. What should be your next steps?		
Give disadvantage & advantages of NTFS file system.		
You want to setup a dual-booting system between windows 98 and windows XP. How would you do this?		
Name one way of checking drives for errors.		
5. You have configured a dual-boot system consisting of windows 98 in FAT 32		

partition and Windows XP using NTFS partition. You checked your windows XP installation and it works correctly. However, when you boot to windows 98 you cannot see the files in the NTFS partition. What is the problem?		
What is the problem if our machine, when booting, gives a constant beeping noise?		
A customer complains that his monitor is not functioning . After examining the computer and diagnosing the defects, you notice that the problem seems to be coming from the memory. Which component(s) should be replaced?		
What indicated by “202” error at system startup?		
You’ve set up a network whereby each computer acts as a client and a server and in which each user shares each other’s resources, including printers. What is the correct term for such setup?		
After a successful upgrading to Windows 2000, what should you do with the temporary files generated during the setup process?		
Feedback to the Candidate:		
The Candidate’s overall performance was:		
Satisfactory <input type="checkbox"/>	Not Satisfactory <input type="checkbox"/>	
Candidate Signature	Date	
Assessor signature	Date	

Written Test:

MULTIPLE CHOICE. **Write the letter of the correct answer.**

Use a separate sheet of paper in answering.

1. Which among the network hardware forwards data packets between Local or Wide Area Network groups.
 - a. Network Hubs
 - b. Network Switch
 - c. Repeater
 - d. Router

2. A typical computer system consists of the following except
 - a. Central Processing Unit
 - b. Input Device
 - c. Network Device
 - d. Output Device
 - e. Storage Device

3. What network hardware strengthens signals and allows them to stay clear over longer distances?
- Network Hubs
 - Network Switch
 - Repeater
 - Router
4. Which of the following is the collection of computers and related equipment that are connected so that data can move between them?
- Computer System
 - Network
 - Hardware
 - Software
5. Which provides the physical link between your computer and the network
- Network Hubs
 - Network Interface Cards
 - Network Switch
 - Router
6. What do you call a device converts computer output into display images?
- Floppy disk
 - Monitor
 - Printer
 - Processor
7. Which of the following is a secondary storage device?
- Floppy Disk Drive
 - Memory Chip
 - Printer
 - Processor
8. If you want to enhance your computer's capabilities, which would you install?
- Monitor
 - Sound Card
 - Speaker
 - Video Card
9. What part of the main circuit board would you connect a peripheral device such as keyboard, printer or video monitor?
- The Bus
 - Port
 - Expansion Slot
 - Cable
10. You want a hard copy of your input, which would provide you this?
- Monitor
 - Printer
 - Speaker
 - Video Camera

B. TRUE OR FALSE. Write T if the statement is true and correct and F if it is not. Use a separate sheet of paper in answering.

- Word processors are used to create special movie effects.
- Systems software tells the CPU what to do.
- Software refers to the set of instructions that computer can understand and execute.
- Reference software includes tutorial and electronic lessons that give students knowledge or training in a particular subject or skill.
- Graphics Program allow the users to execute electronic presentations for reports and other functions.
- The main memory is a software component.
- Processing is the manipulation by which a computer transforms data into information.
- The operating system is the part of the system software.
- Input devices include the keyboard and the mouse.
- Main memory is where programs and data are kept on a long term basis.

QUALIFICATION: COMPUTER HARDWARE SERVICING NC II

UNIT OF COMPETENCY: INSTALL COMPUTER SYSTEMS AND NETWORKS

SPECIFIC INSTRUCTIONS: (For the candidate)

1. Given the necessary tools, instruments, materials, components & software, you are required to disassemble & assemble personal computer, install the operating system and install appropriate drivers. Test the unit and setup the network in accordance with the required criteria.

Duration: 4 hours (inclusive of questioning)

Accomplish the following before the allotted time.

1. Given the working personal computer, disassemble & assemble the system unit. Follow OHS policies and procedures to prevent any damage to the equipment & to you.
2. Using Bootable disk delete existing & create two partitions on the hard disk and make NTFS file system. Install Microsoft XP or any related OS. Install necessary drivers like sound card, video card, LAN card, Printer and other peripherals.
3. Prepare all tools and equipment for network setup. Make straight-through and cross-over cables using appropriate tools provided. Test the connectivity of your cable using LAN tester or network hub and Other PC.

COMPETENCY EVALUATION RESULT SUMMARY

TRINEES NAME			
FACILITATORS NAME			
QUALIFICATION	COMPUTER HARDWARE SERVICING NC II		
DATE OF EVALUATION			
TIME OF EVALUATION			
The Performance of the Trainee in the following assessment methods [Please Tick appropriate box]		Satisfactory	Not Satisfactory
A. Written Exam		<input type="checkbox"/>	<input type="checkbox"/>
B. Interview Facilitator		<input type="checkbox"/>	<input type="checkbox"/>
C. Demonstration		<input type="checkbox"/>	<input type="checkbox"/>
1. Install computer systems and networks		<input type="checkbox"/>	<input type="checkbox"/>
Did the trainees overall performance meet the required evidences/standards?		<input type="checkbox"/>	<input type="checkbox"/>
<p>Recommendation</p> <p><input type="checkbox"/> For re-evaluation _____</p> <p><input type="checkbox"/> Qualified to take the Next Competency</p>			
<p>General comments [Strengths/Improvement Needed]</p>			
Trainee's Signature	Date:		
Facilitator's Signature:	Date:		

ANSWER KEY

INTERVIEW POSSIBLE ANSWER

1. Install windows XP on the other partition using FAT 32.
2. NTFS is a more sophisticated file system. However, it is not compatible with DOS.
3. Partition hard disk into 2, Install 98 in the first partition then XP to the 2nd partition.
4. Check disk & defrag
5. Windows 98 is not compatible with NTFS.
6. Keyboard
7. Memory
8. Memory Problem
9. Peer to peer
10. Nothing

WRITTEN TEST

6. d
7. c
8. c
9. b
10. b
11. a
12. c
13. d
14. b
15. c

A. True or False

1. False
2. True
3. True
4. False
5. False
6. False
7. True
8. True
9. True
10. False

