

Competency-Based Learning Materials (CBLM)**COMPUTER SYSTEMS SERVICING NC II**
CORE COMPETENCY # 1**Module Title:****Installing & Configuring Computer Systems****Unit of Competency:****Install & Configure Computer Systems**

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HOW TO USE THIS MODULE

Welcome to the Module “**Installing of Computer System**”. This module contains training materials and activities for you to complete.

The unit of competency “**Install and Configure Computer Systems**” contains knowledge, skills and attitudes required for a *Computer Systems Servicing NC II* course.

You are required to go through a series of learning activities in order to complete each of the learning outcomes of the module. In each learning outcome there are **Information Sheets**, **Operation Sheets**, and **Job Sheets**. Follow these activities on your own and answer the **Self-Check** at the end of each learning activity.

If you have questions, don’t hesitate to ask your teacher for assistance.

Recognition of Prior Learning (RPL)

You may already have some of the knowledge and skills covered in this module because you have:

- been working for some time
- Already have completed training in this area.

If you can demonstrate to your teacher that you are competent in a particular skill or skills, talk to him/her about having them formally recognized so you don’t have to do the same training again. If you have a qualification or Certificate of Competency from previous trainings show it to your teacher. If the skills you acquired are still current and relevant to this module, they may become part of the evidence you can present for RPL. If you are not sure about the currency of your skills, discuss it with your teacher.

After completing this module ask your teacher to assess your competency. Result of your assessment will be recorded in your competency profile. All the learning activities are designed for you to complete at your own pace.

Inside this module you will find the activities for you to complete followed by relevant information sheets for each learning outcome. Each learning outcome may have more than one learning activity.

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COMPUTER SYSTEM SERVICING NC II

COMPETENCY-BASED LEARNING MATERIALS

List of Competencies

NO.	UNIT OF COMPETENCY	MODULE TITLE	CODE
1.	Install and configure computer systems	Installing and configuring computer systems	ELC724331
2.	Set-up computer networks	Setting-up computer networks	ELC724332
3.	Set-up Computer Servers	Setting-up Computer Servers	ELC724333
4.	Maintain and repair computer systems and networks	Maintaining and repairing computer systems and networks	ELC724334

Program/Course : **Computer Systems Servicing NC II**
Unit of Competency : **Install and Configure Computer Systems**
Module : **Installing and Configuring Computer Systems**

INTRODUCTION:

This module contains information and suggested learning activities on Computer Systems Servicing II. It includes activities and materials on Installation of Computer Systems and Networks.

Completion of this module will help you better understand the succeeding module on the *Installing and configuring computer systems*.

This module consists of **5** learning outcomes. Each learning outcome contains learning activities supported by each instruction sheets. Before you perform the instructions, read the information sheets and answer the self-check and activities provided to ascertain to yourself and your teacher that you have acquired the knowledge necessary to perform the skill portion of the particular learning outcome.

Upon completion of this module, report to your teacher for assessment to check your achievement of knowledge and skills requirement of this module. If you pass the assessment, you will be given a certificate of completion.

SUMMARY OF LEARNING OUTCOMES:

Upon completion of the module you should be able to:

- LO1 Assemble computer hardware
- LO2 Prepare installer
- LO3 Install operating system and drivers for peripherals/ devices
- LO4 Install application software
- LO5 Conduct testing and documentation

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TECHNICAL TERMS

- **Anti-Static** – A product that prevents the buildup 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.
- **Graphic tablet** – objects are drawn using a pen or a puck. The puck is technically a tablet cursor, not a mouse.
- **Hard-disk drive** – is a storage device that stores billions of characters of data on a non-removable disk.
- **Hardware**- refers to the tangible (things you can touch) components of a computer system. Hardware components are further divided into three groups namely
- **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.
- **Multi-tester**- 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.
- **OHS** – Occupational Health and Safety
- **Operating System (OS)** - software that controls the allocation and use of programs and data that a computer uses.
- **Peers**- mean any computer sharing the same protocol layer with another computer.
- **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** – Registered Jack 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, 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 assess to carry out a particular job.
- **Software** – programs and data that a computer uses.
- **Static** – The discharge of electricity between two objects with different electrical potential
- **USB** – Universal Serial Bus, a hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, scanner, printer and telephony devices.

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Program/Course : **Computer Systems Servicing NC II**
Unit of Competency : **Install and Configure Computer Systems**
Module : **Installing and Configuring Computer Systems**

Learning Outcome 01: Assemble computer hardware

Assessment Criteria:

1. Unit assembly is planned and prepared to ensure **OH&S policies and procedures** are followed in accordance with systems requirements
2. Materials necessary to complete the work are identified and obtained in accordance with established procedures and checked against systems requirements
3. **Tools, equipment and testing devices** needed to carry out the installation work are obtained in accordance with established procedures and checked for correct operation and safety
4. **Computer hardware** is assembled in accordance with established procedures and systems requirements
5. Basic-input-**output**-system (BIOS) configuration is performed in accordance with hardware requirements.

Resources:

Equipment and Accessories	Tools	Materials
LAN Card	Screwdriver(standard)	Software applications
UPS	Screwdriver(Philips)	Network OS Software
Server	Long nose pliers	RJ 45
8 port-hub	Mechanical pliers	UTP Cat 5 cable
Modem	Allen wrench	Motherboard's manual
Fax machine	Multitester	and installer
USB printers	Crimping tools	
USB Flash Drive	Soldering iron (30 watts)	
	Wire stripper	
	LAN Tester	
	Anti-static wrist wrap	
	Device drivers/installers	

References:

- Sto. Domingo, Josephine C., Learning Windows XP and Internet the Easy Way Computers-The Easy Way
- Andres Sr., Antonio M. Introduction of Computer. Fully Illustrated, Valenzuela City; May 2003 World Class Publishing and Packaging
- HASOP (Hardware, Software and Peripherals)Reference Manual, 2005
- Computer Fundamentals, Makati City: STI Technology Institute Inc.; Copyright 1997
- www.wikipedia.org

Learning Experiences

Learning Outcome 1 - Assemble Computer Hardware

Learning Activities	Special Instructions
1. Read information sheet on 1.1 (OHS Policies and Procedures)	
2. Answer Self-Check 1.1	
3. Read information sheet on 1.2 (Introduction to Computer systems)	
4. Answer Self-Check 1.2	
5. Perform Job Sheet 1.1 – Assemble Computer Hardware	Read each Information Sheet and Answer the Self-Check at the end of each Learning Activity. There are Learning Activities that may require you to perform certain Task and Jobs that you have to perform and check your performance based on the performance criteria set. At the completion of this module you will be able to assemble computer hardware.
6. Check your answer using the Answer Keys below	

INFORMATION SHEET 1.1

OHS Policies and Procedures

Occupational Health and Safety Policy

In the school as a computer teacher you must be aware of how your students behave when they are working in the computer laboratory, as well as implementing a safe way of accomplishing every task. 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

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:

OCCUPATIONAL HEALTH & SAFETY (OHS) PROCEDURES

(When assembling computer hardware)

1. Wear shoes with non-conductive rubber soles to help reduce the chance of being shocked.
2. Unplug all electronics/equipment from the power source?
3. Do not remove expansion cards or other components a computer when it is turned on.
4. Remove all jewelry when working inside any computer related equipment.
5. Be sure not to mix electronic components and water.
6. Do not over tighten the screws.
7. Always handle computer components by the edges.
8. Wear an anti-static device to prevent Electro Static Discharge.

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Self-Check 1.1

- A. Enumerate the occupation health & safety (OHS) procedures when assembling computer hardware.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

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INFORMATION SHEET 1.2

Introduction to Computer Systems

What is Computer?

A computer is an electronic device that helps people perform different tasks.

It accepts information (in the form of digitalized data) and manipulates it for some result based on a program or sequence of instructions on how the data is to be processed.



FOUR (4) TYPES OF COMPUTER:

Since the advent of the first computer different types and sizes of computers are offering different services. Computers can be as big as occupying a large building and as small as a laptop or a microcontroller in systems. The four basic types of computers are:

1. Super computer
2. Mainframe computer
3. Minicomputer
4. Microcomputer

1. Supercomputer

The **most powerful computers** in terms of performance and data processing are the supercomputers. These are specialized and task specific computers used by large organizations. These computers are used for research and exploration purposes, like **NASA** uses supercomputers for launching space shuttles, controlling them and for space exploration purpose.

Uses of Supercomputer:

- Space Exploration
- Earthquake studies
- Weather Forecasting
- Nuclear weapons testing



IBM AC922 system

This Supercomputer Can Calculate in 1 Second What Would Take You 6 Billion Years. The supercomputer is an IBM AC922 system that's made up of 4,608 computer servers

2. Mainframe computer

Although Mainframes are not as powerful as supercomputers, but certainly they are quite expensive nonetheless, and many large firms & government organizations uses Mainframes to run their business operations. The Mainframe computers can be accommodated in large air-conditioned rooms because of its size. Super-computers are the fastest computers with large data storage capacity.



3. Minicomputer

Minicomputers are used by small businesses & firms. Minicomputers are also called as "**Midrange Computers**". These small machines and can be accommodated on a desk with not as processing and data storage capabilities as super-computers & Mainframes.



4. Microcomputer

Desktop computers, laptops, personal digital assistant (PDA), tablets & smartphones are all **types of microcomputers**. The micro-computers are widely used & the fastest growing computers. These computers are the cheapest among the other three types of computers. The Micro-computers are specially designed for general usage like entertainment, education and work purposes. Well known manufacturers of Micro-computer are Dell, Apple, Samsung, Sony & Toshiba.

Examples of Microcomputers



Desktop computer

Laptop

Netbook

Hybrid

Tablet

Smartphone

THE 3 FUNDAMENTAL ELEMENTS OF THE COMPUTER

c

1. **System Unit**>acts like the center or core, processing the data and information it receives from input devices.
2. **Input Devices**>An input device is any hardware device that sends data to a computer, allowing you to interact with and control the computer.
3. **Output Devices**>these are the devices like printers. It receives the system unit's processed information.



1. Input Devices



The most commonly used or primary input devices on a computer are the keyboard and mouse. However, there are dozens of other devices that can also be used to input data into the computer.

2. Output Device

Is any peripheral that receives data from a computer, usually for display, projection, or physical reproduction.



3. System Unit

*Basic Parts of the System Unit:

1. System Case
2. Motherboard
3. Central Processing Unit (CPU)
4. Random Access Memory (RAM)
5. Power Supply
6. Hard disk
7. CDROM drive
8. Expansion Slot



1. System Case

A computer case also known as a computer chassis, tower, system unit, cabinet, base unit or simply case and sometimes incorrectly referred to as the "CPU" or "hard drive", is the enclosure that contains most of the components of a computer.



Two Types of System Case

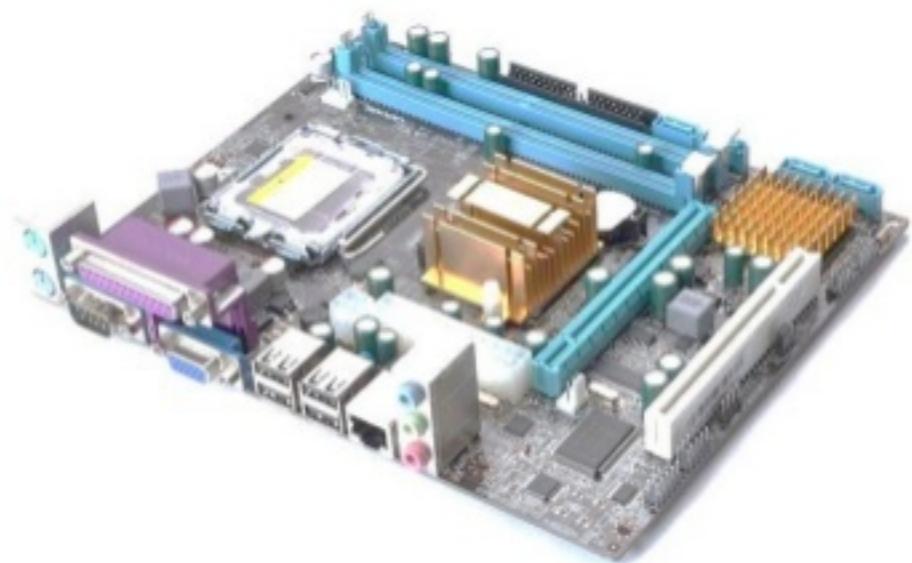
1. Tower (Full, Mid, Mini) – designed to sit vertically
2. Desktop (Standard, Slimline) – designed to sit horizontally

Tower Case

2. Motherboard

A printed circuit board containing the principal components of a computer or other device, with connectors into which other circuit boards can be slotted.

It holds and allows communication between many of the crucial electronic components of a system such as the central processing unit (CPU) and memory, and provides connectors for other peripherals.



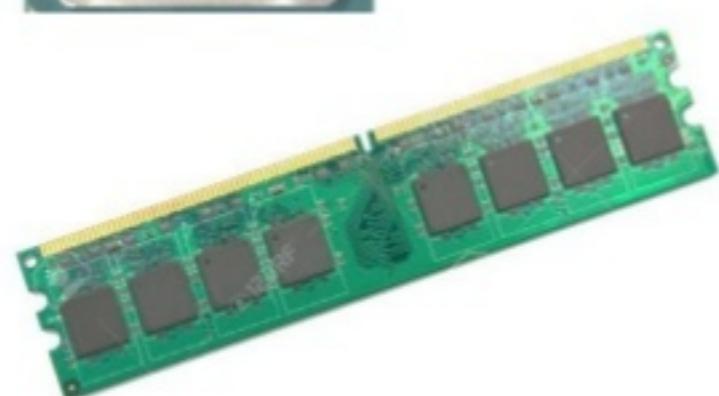
3. Central Processing Unit (CPU)

A CPU is the electronic circuitry within a computer that carries out the instructions of a computer program by performing the basic arithmetic, logical, control and input/output (I/O) operations specified by the instructions.



4. Random Access Memory (RAM)

RAM is the physical hardware inside a computer that temporarily stores data, serving as the computer's "working" memory. Additional RAM allows a computer to work with more information at the same time, which usually has a considerable effect on total system performance.



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5. Power Supply

A power supply is an electronic device that supplies electric energy to an electrical load. The primary function of a power supply is to convert one form of electrical energy to another and, as a result, power supplies are sometimes referred to as electric power converters.



6. Hard Disk Drive (HDD)

The hard disk drive is the main, and usually largest, data storage hardware device in a computer. The operating system, software titles, and most other files are stored in the hard disk drive.



The hard drive is sometimes referred to as the "C drive" due to the fact that Microsoft Windows, by default, designates the "C" drive letter to the primary partition on the primary hard drive in a computer.



e hard disk

Old and Newer Hard drive

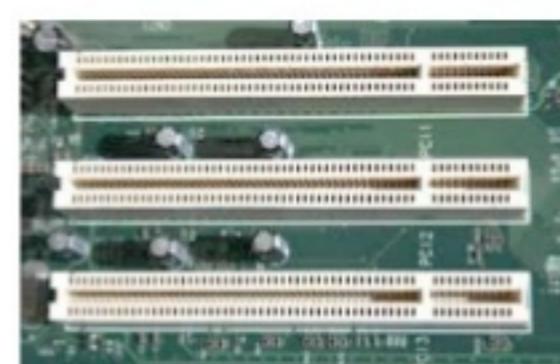
1. SATA - Serial Advance Technology Attachment (new)
2. IDE – Integrated Drive Electronics (old)



7. CD-ROM Drive



A **CD-ROM** /si:dʒ'rom/ is a pre-pressed optical compact disc which contains data. The name is an acronym which stands for "**Compact Disc Read-Only Memory**". Computers can read CD-ROMs, but cannot write to CD-ROMs which are not writable or erasable.
CD – Compact Disk, DVD – Digital Versatile Disk

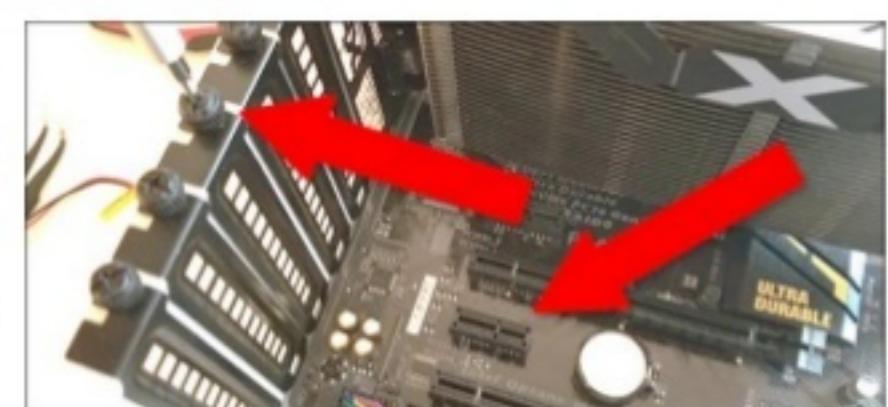


8. Expansion Slot

The expansion slot (also expansion accessory card) in computing is a printed circuit board, adapter card or circuit board that can be inserted into an electrical connector, or expansion slot on a computer motherboard, backplane or riser card to add functionality to a computer system via the expansion bus.

This is where you install the video card, sound card, LAN card,

board, adapter card or circuit board that can be



SELF-CHECK 1.2

Matching Type: Match the picture in Column A with its name in Column B. Write your answer only on a sheet of paper.

Column A



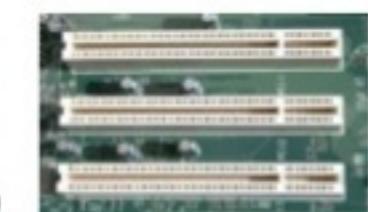
A.



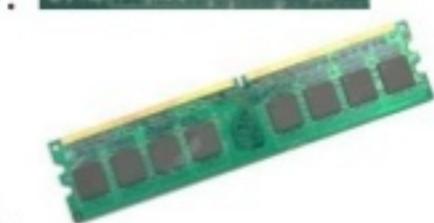
B.



C.



D.



E.



F.



G.



H.



I.



J.

Column B

_____ 1. Power Supply

_____ 2. Motherboard

_____ 3. CDROM Drive

_____ 4. System Case

_____ 5. CPU

_____ 6. Hard Disk Drive

_____ 7. Expansion Slot

_____ 8. RAM

_____ 9. Mainframe Computer

_____ 10. Supercomputer

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SELF CHECK 1.3

1. What is computer?
2. What are the four (4) types of computer?
3. What are the three (3) Fundamental Elements of the computer system?
4. Give at least five (5) examples of Input devices
5. Give at least five (5) examples of Output devices
6. Enumerate the eight (8) Basic Parts of the System Unit

SELF CHECK 1.4

Give the acronym of the following:

1. CPU
2. RAM
3. HDD
4. USB
5. SATA
6. IDE
7. I/O
8. BIOS
9. CD
10. RJ45

Job Sheet 1.1

Title : Computer Assembly and Disassembly

Performance Objective: Prepare the computer components & peripherals for Computer Disassemble and Assemble

Tools/PPE: Screwdriver/Antistatic Wrist strap

Equipment : Computer Set

Steps/Procedure:

1. Prepare the workplace for assembly / disassembly
2. Use proper Personal Protective Equipment
3. Conduct Inventory on the different components & peripherals for Computer Disassembly and Assembly.
4. Follow Occupational Health and Safety during the performance of each task
5. Disassemble / Assemble Computer Hardware for the following
6. Desktop Unit
7. Implement 5's and 3'r and computer ergonomics during the activity.
8. Identify faults during the assembly and disassembly
9. Submit output to trainer for evaluation

Assessment Method: Performance Demonstration.

PERFORMANCE CRITERIA CHECKLIST

JOB SHEET 1.1

Assemble Computer Hardware

Trainee's Name: _____ Date : _____

CRITERIA	YES	NO	N/A
1. Did you unplug all electronics/equipment from the power source?			
2. Did you remove all peripheral attachment properly?			
3. Did you use the hand tools correctly?			
4. Did you remove the power supply properly?			
5. Did you remove the hard disk and CD rom from the system unit?			
6. Did you remove the Video card, NIC card from the Motherboard?			
7. Did the Motherboard remove from the System Unit?			
8. Did you the parts return its original place?			
9. Did you bring the tools needed in Computer Assembly?			
10. Did you know all the parts of computer hardware?			
11. Did you use the Hand tools properly?			
12. Did you prepare the motherboard correctly?			
13. Did you install the CPU into the motherboard?			
14. Did you install the RAM into the motherboard?			
15. Did the motherboard place into the Case?			
16. Did you connect the Power supply correctly?			
17. Did you install the Video Card and NIC?			

Comments/Suggestions

Trainer's Signature: _____ Date : _____

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Program/ Course: **Computer Systems Servicing**
Unit of Competency: **Install and Configure Computer Systems**

Module: **Installing of Computer Systems and Networks**

Learning Outcome # 02 : Prepare installer

Assessment Criteria:

1. Portable bootable devices are created in accordance with software manufacturer instruction
2. Customized installers are prepared in accordance with software utilization guide and end user agreement.
3. Installation of portable applications are carried out in accordance with software user guide and software license

Resources:

Tools, Materials and Equipment and Facilities

- ICT Laboratory
- Computer Table and Chairs
- Computers
- Printers
- LCD
- Webcam
- Digital Camera
- Installation CDs
- And other Computer Accessories

References:

- 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
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- <http://www.geeks.com/techtips/2006/techtips-24aug06.htm>
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- Sawyer, Stackey G./ Williams, Brian K., Using Information Technology, A Practical Introduction to Computers and Communications International Ed. MC Graw-Hill Higher Education;2000

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Learning Experiences

Learning Outcome 2 – Prepare installer

Learning Activities	Special Instructions
1. Read information sheet on 2.1 (Software Installation)	
2. Answer Self-Check 2.1	
3. Read information sheet on 2.2 (How to create bootable installer)	
4. Answer Self-Check 2.2	
5. Perform Job Sheet 2.1 Prepare bootable USB installer (Windows 7 bootable USB)	Read each Information Sheet and Answer the Self-Check at the end of each Learning Activity. There are Learning Activities that may require you to perform certain Task and Jobs that you have to perform and check your performance based on the performance criteria set. At the completion of this module you will be able to assemble computer hardware.
6. Check your answer using the Answer Keys below	

Information Sheet 2.1

Software Installation

An installation program or installer is a computer program that installs files, such as applications, drivers, or other software, onto a computer.



Installation (or setup) of a computer program (including device drivers and plugins), is the act of making the program ready for execution. Because the process varies for each program and each computer, programs (including operating systems) often come with an installer, a specialized program responsible for doing whatever is needed for their installation. Installation may be part of a larger software deployment process.

Installer

An installation program or installer is a computer program that installs files, such as applications, drivers, or other software, onto a computer. Some installers are specifically made to install the files they contain; other installers are general-purpose and work by reading the contents of the software package to be installed.

Common Windows Installer File Extension:

1. Executable - .exe
2. Microsoft Windows Installation - .msi
3. Compressed Zip File - .zip
4. ISO image - .iso



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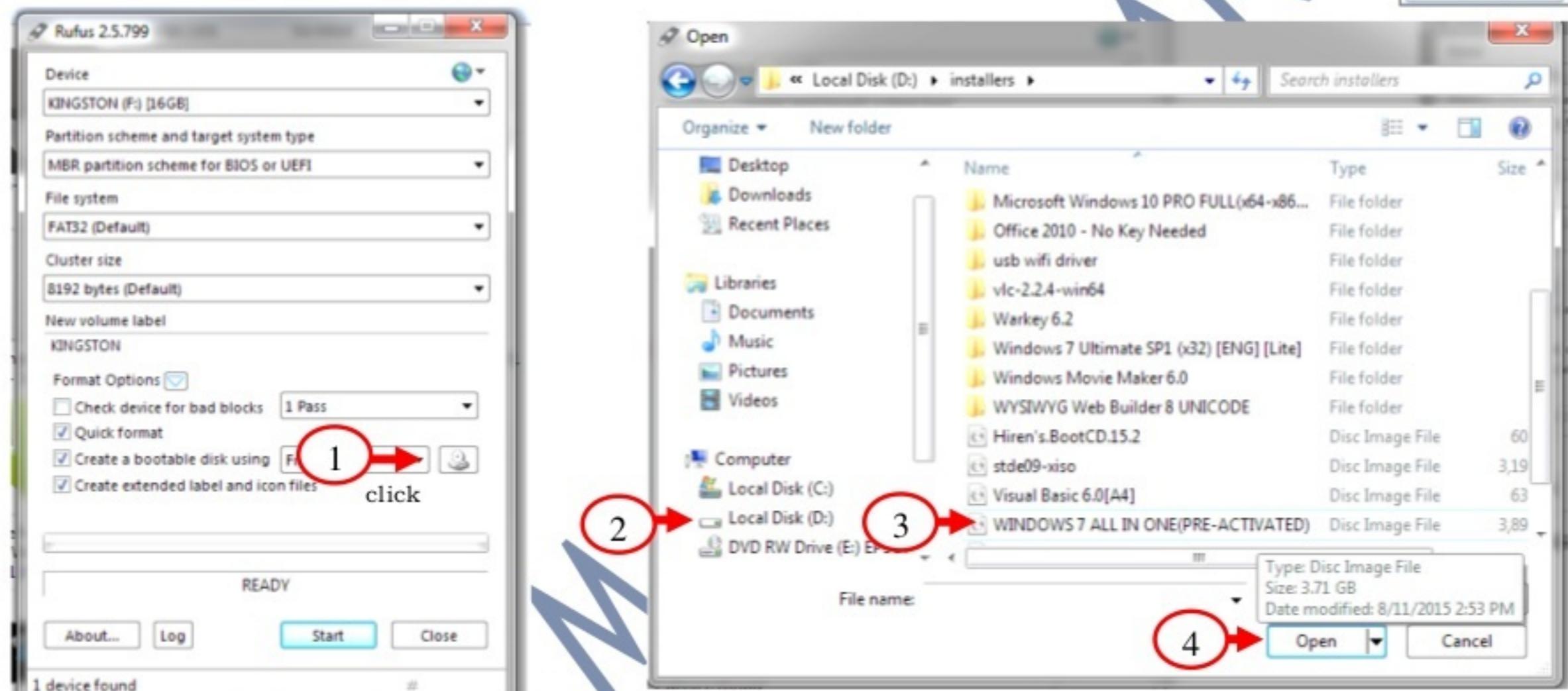
Information Sheet 2.2

How to create bootable USB Windows Installer

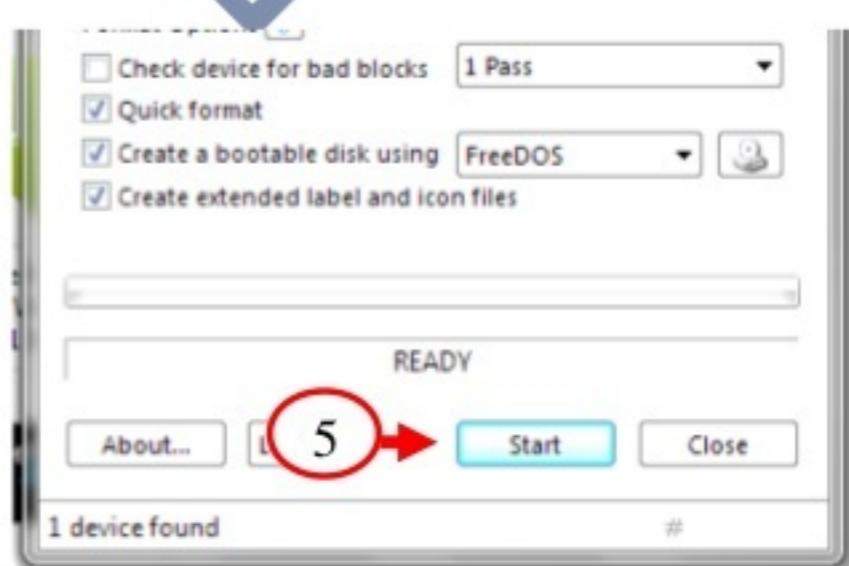
Things you need:

- Apple (or PC) running XP or Windows 7+
- Rufus application (3rd party software)
- ISO image – in this example Windows 7 OS
- 8 GB USB flash drive (minimum recommended)

Step 1– Find and open the **Rufus** application.



Step 2 - Click the **optical drive button** next to the Create a bootable disk using checkbox, and you'll be prompted to search for the ISO image to use.



Step 3 – Search the **ISO image** which is normally found at Computer>Local Disk D: and click on Open button.

Step 4 – Finally click on **Start button**. When prompted click Yes to format flash drive.

Warning! All data from the flash drive will be erased during the process.

SELF CHECK 2.1

1. Common Windows Installer File Extension
 - 2.
 - 3.
 - 4.
2. What is an installer?

SELF CHECK 2.2

1. What are the steps in preparing bootable USB installer?

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Job Sheet 1.2

Title : Prepare bootable installer

Performance Objective: Prepare the USB Flash disk and Bootable Disk Image for creating bootable USB installer

Tools/Software: USB Flash Drive, Rufus Application, Windows 7 Disc Image

Equipment : Computer Set

Steps/Procedure:

1. Prepare the USB Flash Drive
2. *Optional – Format the flash drive by Right clicking on the Removable device and select Format.
3. Open Rufus Application
4. Click the optical drive button next to the Create a bootable disk
5. Search the ISO image which is normally found at Computer>Local Disk D: and click on Open button. (Windows 7 All In one.iso)
6. Finally click on Start button. When prompted click Yes to format flash drive.
7. Warning! All data from the flash drive will be erased during the process.

Assessment Method: Performance Demonstration.

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Program/ Course: **Computer Systems Servicing**
Unit of Competency: **Install and Configure Computer Systems**

Module: **Installing and Configuring Computer Systems**

Learning Outcome No. 3
Install operating system and drivers for peripherals/ devices

Assessment Criteria:

1. Operating system (OS) is installed in accordance with established installation procedures and to comply with end-user requirements
2. Peripherals/devices drivers are installed and configured in accordance with manufacturer's instructions and/or OS installation procedures.
3. OS and drivers updates/patches are accessed and installed in accordance with manufacturer's recommendations and requirements
4. On-going checks of the quality of the work are undertaken in accordance with established procedures

Tools, Materials and Equipment and Facilities

- ICT Laboratory
- Computer Table and Chairs
- Computers
- Printers
- Installation CDs
- And other Computer Accessories

References:

- Sawyer, Stackey G./ Williams, Brian K., Using Information Technology, A Practical Introduction to Computers and Communications International Ed. MC Graw-Hill Higher Education;2000
- Meyers Mike, Introduction to PC Hardware and Troubleshooting, Philippines: McGraw-Hill Education (Asia): 2006
- Marcelo, Antoinette R., Understanding PC Hardware, Philippines: Jemma Inc., 2007
- http://www.pcguide.com/byop/byop_PoweringUptheSystemfortheFirstTime.htm
- <http://www.tekexam.com/StudGuide/concepts/Troubleshooting/troubleshooting.html>
- <http://www.pcguide.com/ts/toolsSoftware-c.html>

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Learning Experiences

Learning Outcome 3 – Install operating system and drivers for peripherals/ devices

Learning Activities	Special Instructions
1. Read information sheet on 3.1 (Software)	
2. Answer Self-Check 3.1	
3. Read information sheet on 3.2	
4. Answer Self Check 3.2	
5. Read Information Sheet 3.3 (Device Drivers)	
6. Answer Self Check 3.3	
7. Perform Job Sheet 3.1 (Installing an Operating System -Windows 7)	Read each Information Sheet and Answer the Self-Check at the end of each Learning Activity. There are Learning Activities that may require you to perform certain Task and Jobs that you have to perform and check your performance based on the performance criteria set. At the completion of this module you will be able to assemble computer hardware.
8. Perform Operation Sheet 3.1 (Device Drivers Installation)	
9. Check your answer using the Answer Keys below	

INFORMATION SHEET 3.1

Software

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.

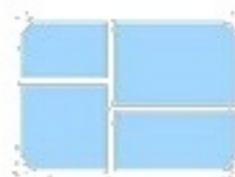
Three Types of Software

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

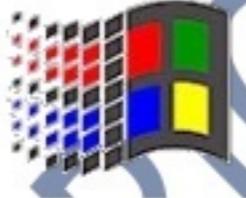
1. Operating System - This software tells the CPU what to do. software that controls the allocation and use of programs and data that a computer uses. Below is a listing of common operating systems available today, and who developed them.

Operating system	Developer
Windows 7	Microsoft
Windows 8	Microsoft
Windows 10	Microsoft
Windows Server 2008	Microsoft
Windows Server 2012	Microsoft
Windows Server 2016	Microsoft
Corel Linux	Corel
MAC OS X	Apple
Mandrake Linux	Mandrake

Common Operating Systems and its Logo



Window 1.0



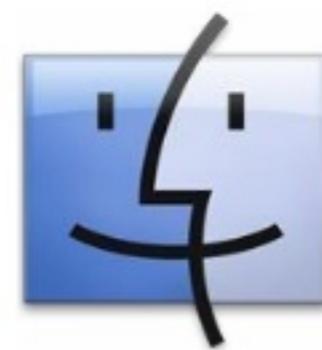
Windows 3.1



Windows 95



Windows XP



Mac OS X



Windows Vista



Windows 7



Windows 10



2. 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:

- MS Word, WordPad and Notepad
- Internet browsers like Firefox, Safari, and Chrome
- Microsoft Power Point, Keynotes
- Auto CAD
- MySQL, Oracle, MS Access
- Apple Numbers, Microsoft Excel
- Real Player, Media Player, VLC Player
- Dictionaries: Encarta, Britannica Mathematical: MATLAB Others: Google Earth, NASA World Wind
- OpenOffice, Microsoft Office



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



SELF CHECK 3.1

1. What are the three (3) types of software?
2. Common Operating systems (Give at least 5)
3. Examples of Application Software (Give at least 5)
4. Examples of Programming Language (Give at least 3)

SELF CHECK 3.2

Identify the OS, Application Software & Programming Language

Identify if the icon is an Operating System, Application Software or Programming Language (*One example is given at number 1*)



1. Application Software



2. _____



3. _____



4. _____



5. _____



6. _____



7. _____



8. _____



9. _____



10. _____

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INFORMATION SHEET 3.2

How to install an Operating System (Windows 7) Screen Shots

Step 1 : Insert bootable USB installer

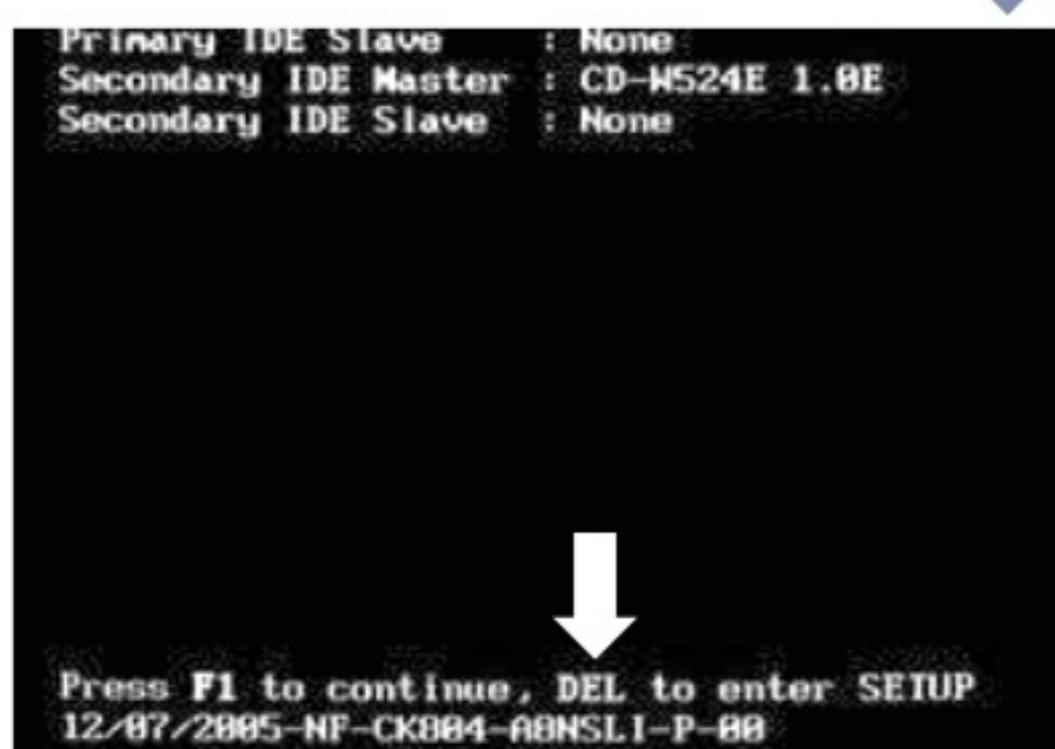


Step 2 : Power on PC

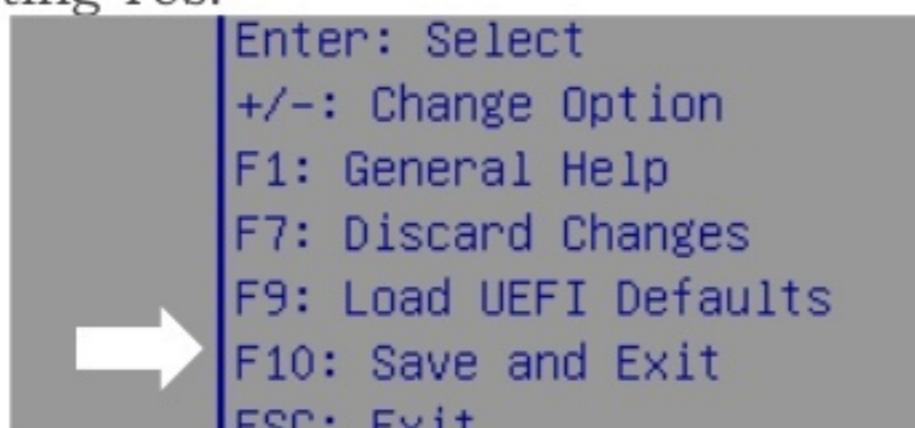


Step 3 : Press BIOS setup key repeatedly
(Depends on PC Brand: F1, F2, F10, Del)

*If you are unsure which one to press, simply press F1, F2, F10 and Del key altogether.



Step 5 : Save the new settings by pressing F10, Esc (Depends on BIOS). Confirm by selecting Yes.

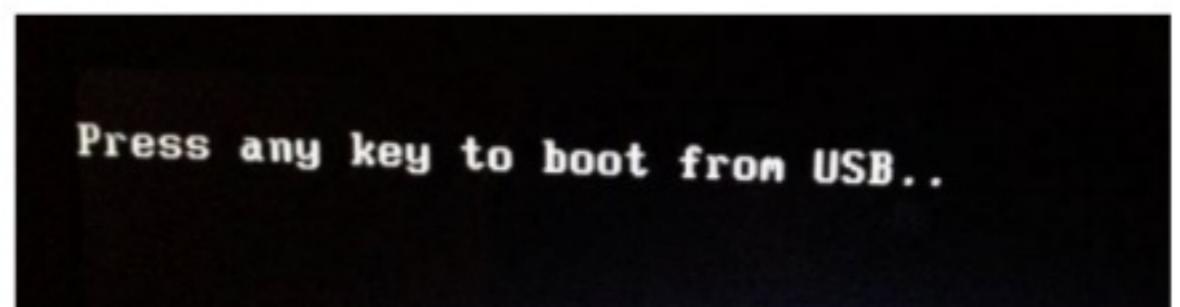


Step 4 : Arrange Boot Order, Boot Sequence, Start-up device or something similar, making the UBS/Removable Device our first boot option:

1st Boot – USB installer
2nd Boot – Hard Disk



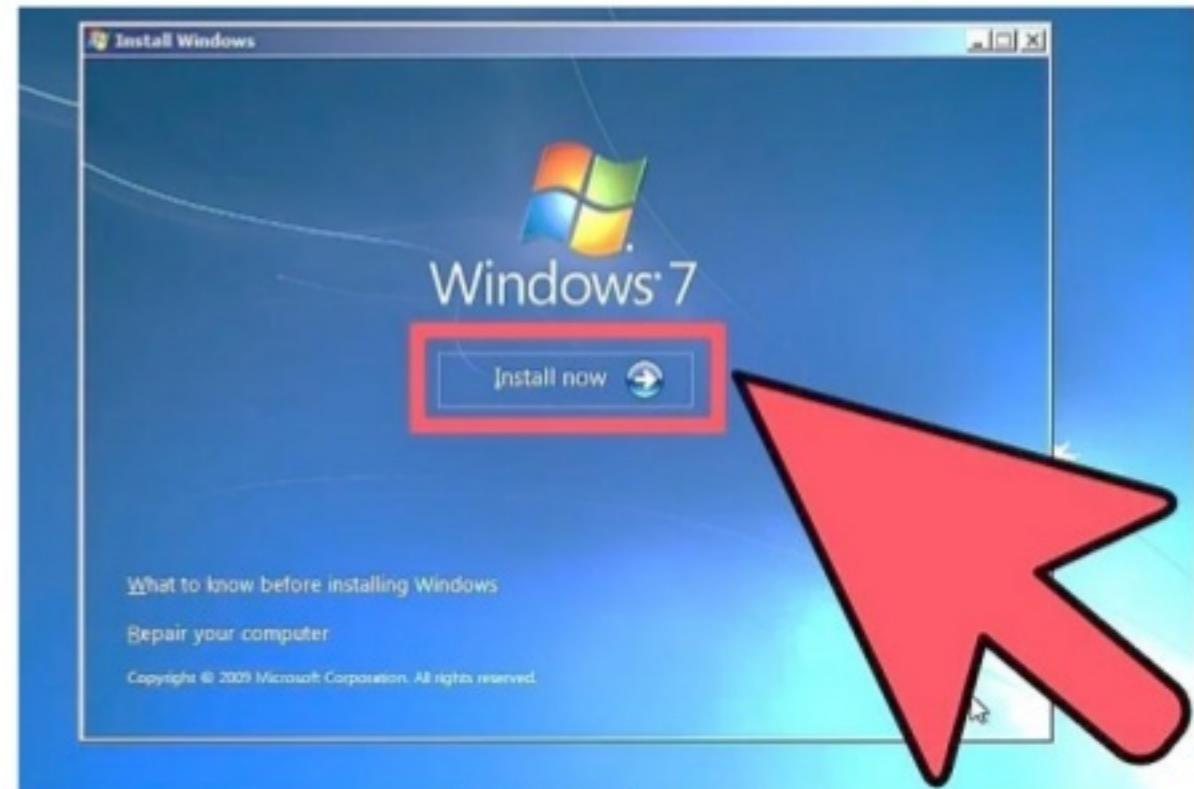
Step 6: Quickly press any key to boot from USB.



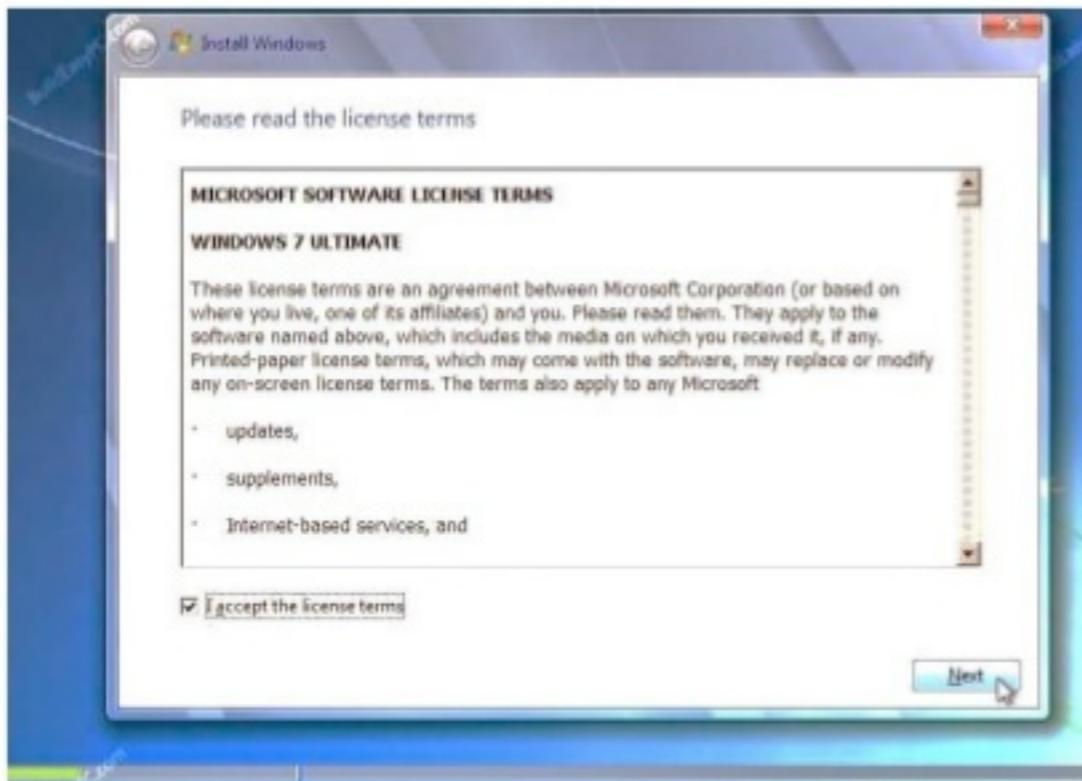
Step 7: Click on Next to continue



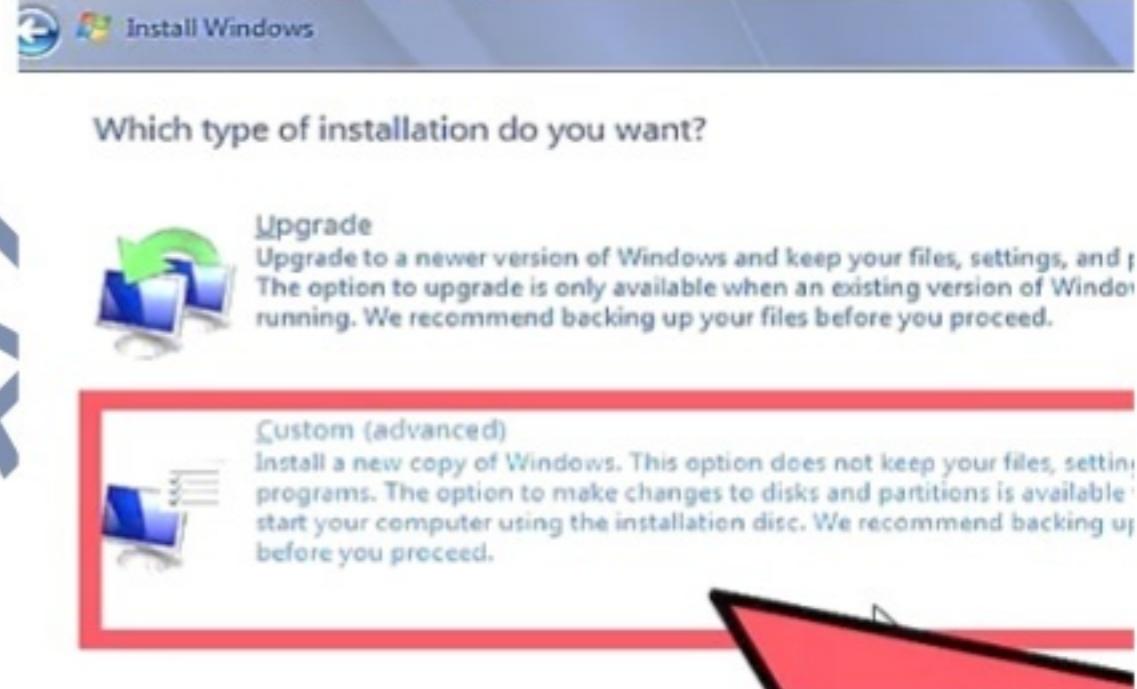
Step 8 : Click on Install Now



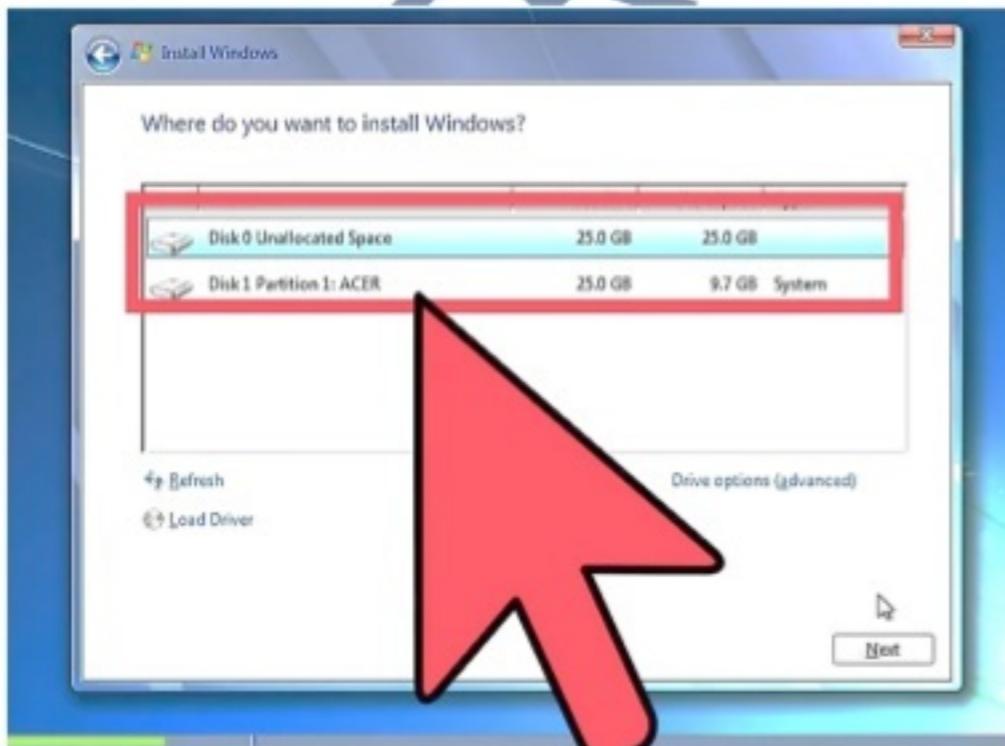
Step 9 : Check on I accept... and click Next



Step 10: Select custom installation



Step 11 : Delete and create partition and click Next



Step 12 : Wait for the installation to finish



Job Sheet 3.1

Title : Installing an Operating System (Windows 7)

Performance Objective: Prepare the bootable disk and computer for installing an Operating System.

Tools/Software: Bootable USB installer (Windows 7)

Equipment : Computer Set

Steps/Procedure:

1. Prepare the bootable USB installer
2. Prepare the computer unit
3. Refer to information 3.2 on how to install an Operating System.

Assessment Method: Performance Demonstration.

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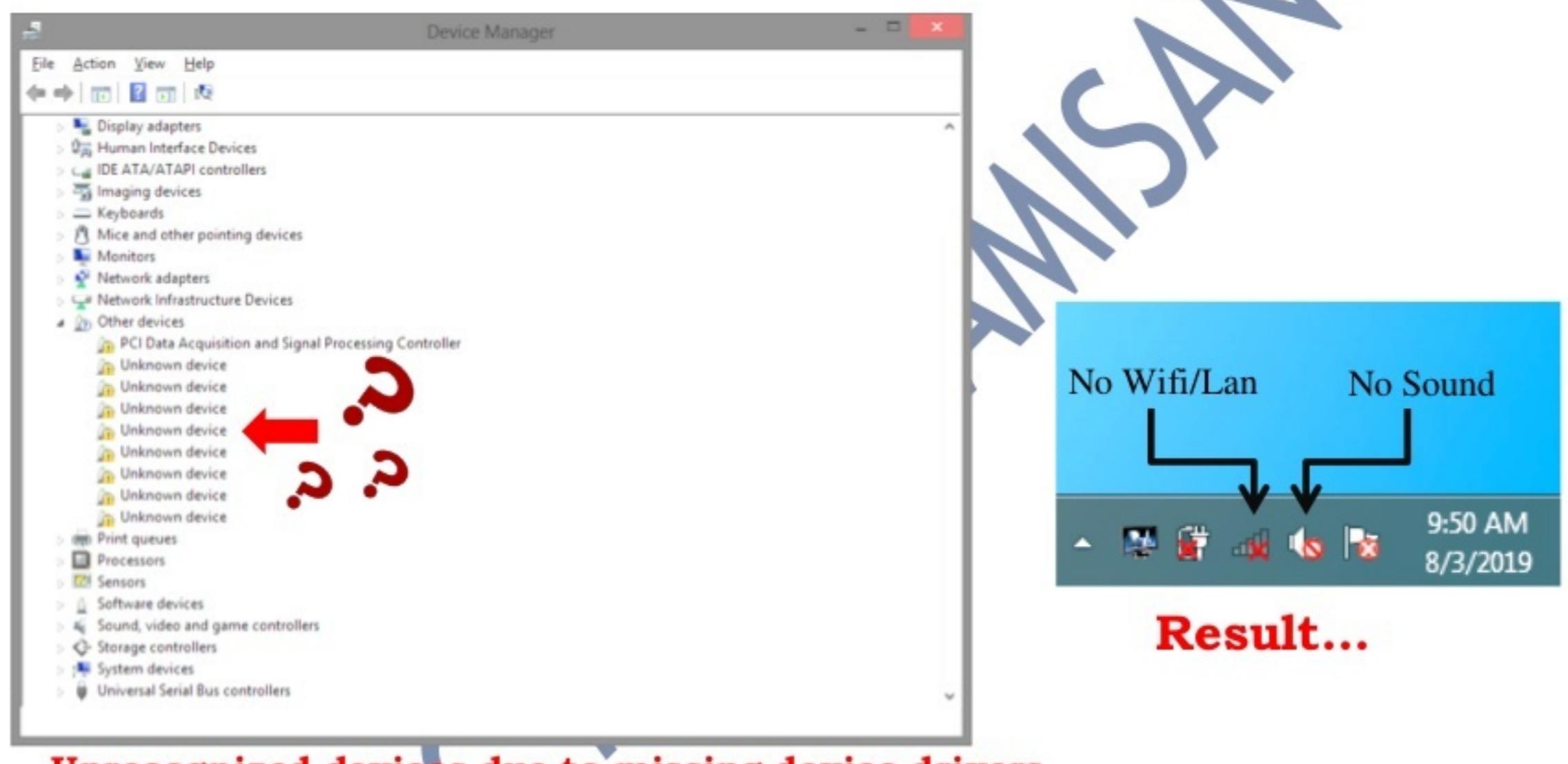
INFORMATION SHEET 3.3

Device Drivers

Device Drivers

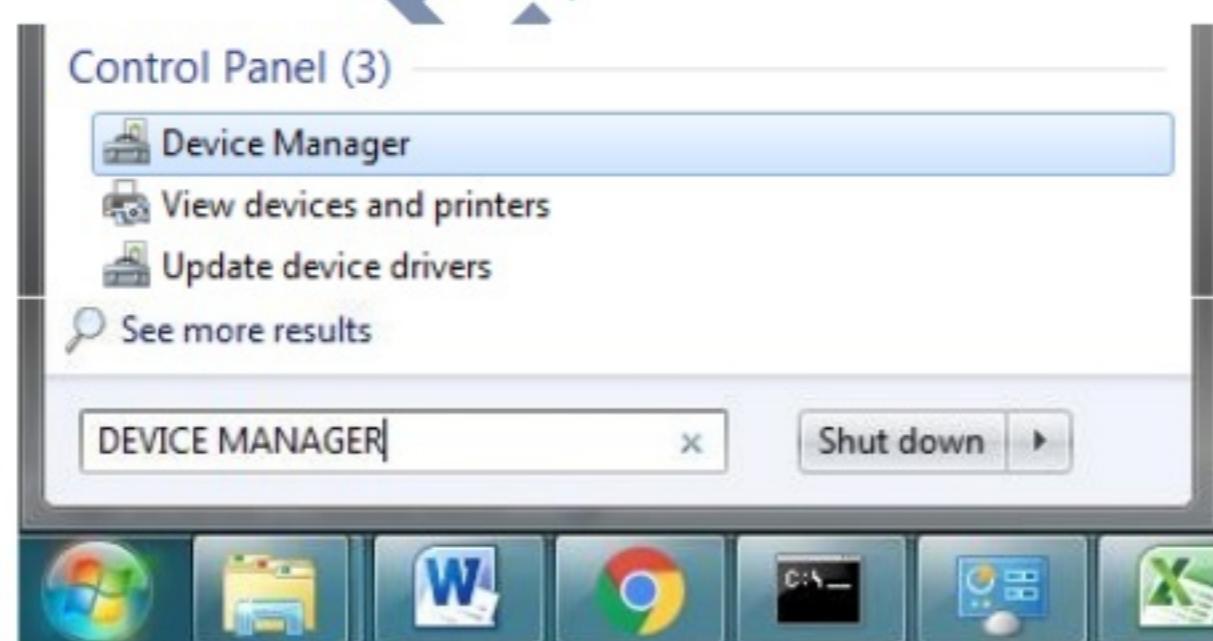
Now that you have an operating system installed, you'll need to install drivers for your devices such as Video Cards, Network Interface Cards, Sound Cards, etc. In many cases, if Windows recognizes the device, drivers will be installed automatically. In some cases, generic drivers are installed and they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



Unrecognized devices due to missing device drivers.

To check if you have missing device drivers, click on the Windows Start button and search for **Device Manager**.



How to Install Device Drivers

Here are the several ways on how to install device drivers:

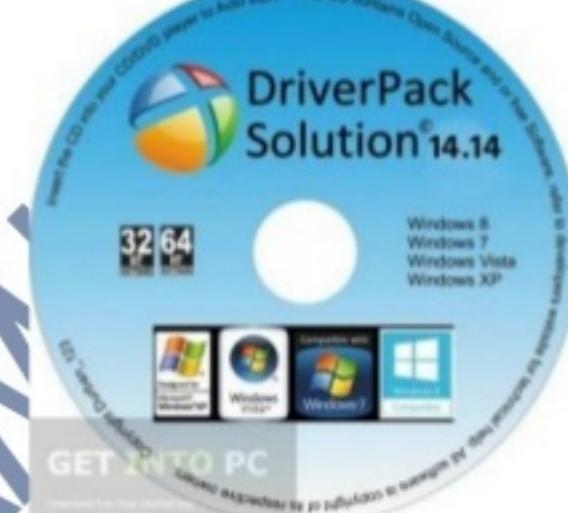
1. Manufacturer's DVD/Installer

Normally provided upon buying your computer/printer/laptop

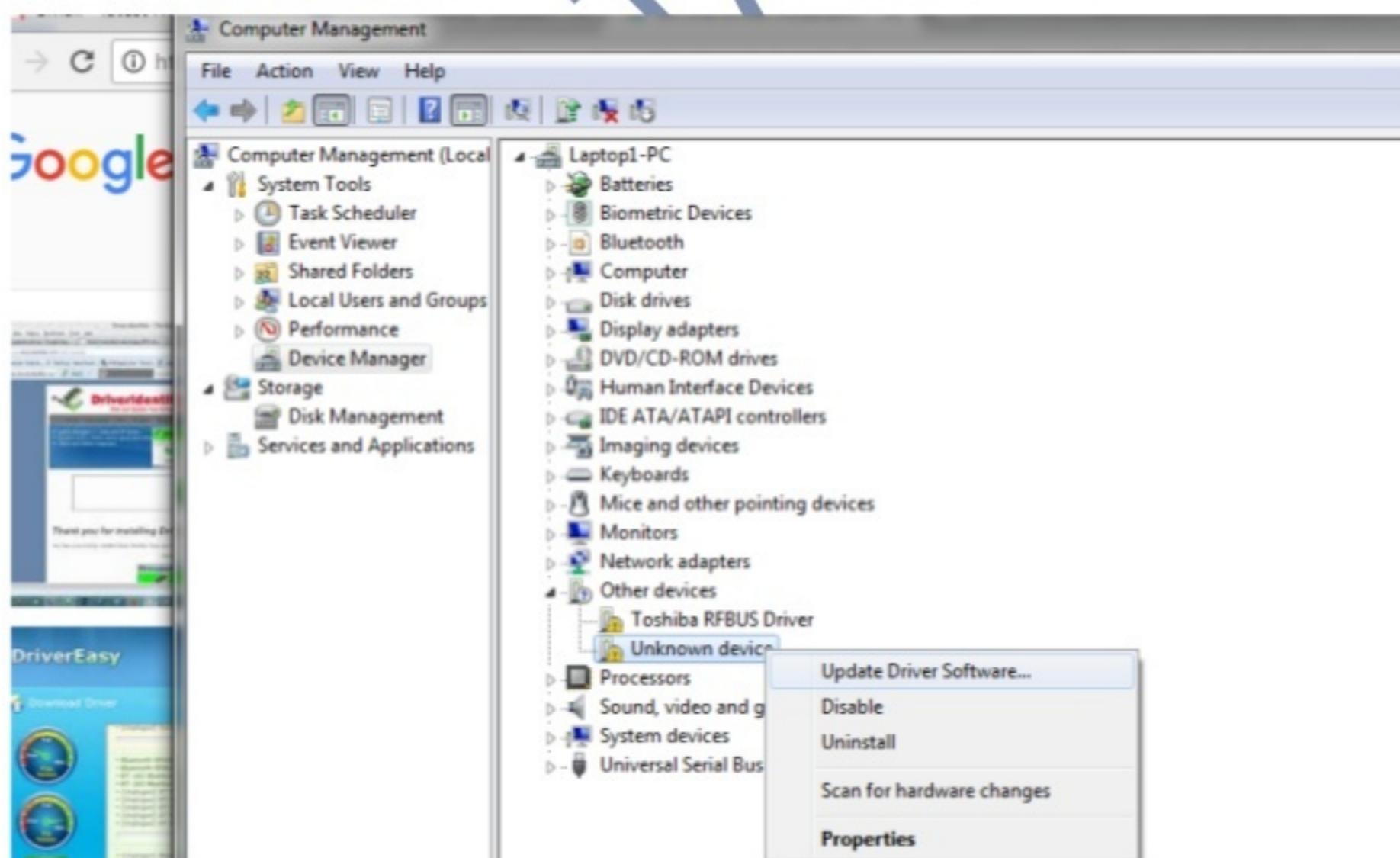


2. Driver Pack Solution

Packaged of drivers where you can install drivers offline even without an internet connection.



3. Device Manager (Update Driver Software)



To access : click on Start>Right Click Computer>Manage>Device Manager

4. Download on-line

Search the web, key in the Model Name & Number

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SELF CHECK 3.3

1. Enumerate the steps in installing an Operating System (OS) – Windows 7
2. Give the four ways on how to install device drivers
3. How do you access device manager?
4. What ways in installing device drivers?

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OPERATION SHEET 3.1

Device Drivers

Material: Installation CD

Given an installation CD, perform installation of a device driver.

Student's output will be graded thru Performance Score Card below.

PERFORMANCE SCORE CARD

Performance Criteria	Scoring				
	1	2	3	4	5
1. The system is correctly started.					
2. The Installation CD is properly inserted.					
3. Handling and safekeeping of installation CD is observed.					
4. The instructions how to install device drivers are accurately followed.					
5. The device drivers are successfully installed					

5	-	Excellently Performed
4	-	Very Satisfactorily Performed
3	-	Satisfactorily Performed
2	-	Fairly Performed
1	-	Poorly Performed

Program/ Course: **Computer Systems Servicing**
Unit of Competency: **Install and Configure Computer Systems**

Module: **Installing and Configuring Computer Systems**

Learning Outcome No. 4 **Install application software**

Assessment Criteria:

1. Application software are installed based on software installation guides, end-user requirements and software license agreement
2. Variation to application software installation is carried out in accordance to customer/client requirements
3. Software updates are accessed and installed in accordance with manufacturer's recommendations and requirements

Resources:

Tools, Materials and Equipment and Facilities

- ICT Laboratory
- Computer Table and Chairs
- Computers
- Printers
- Installation CDs
- And other Computer Accessories

References:

- Sawyer, Stackey G./ Williams, Brian K., Using Information Technology, A Practical Introduction to Computers and Communications International Ed. MC Graw-Hill Higher Education;2000
- Meyers Mike, Introduction to PC Hardware and Troubleshooting, Philippines: McGraw-Hill Education (Asia): 2006
- Marcelo, Antoinette R., Understanding PC Hardware, Philippines: Jemma Inc., 2007
- http://www.pcguide.com/byop/byop_PoweringUptheSystemfortheFirstTime.htm
- <http://www.tekexam.com/StudyGuide/concepts/Troubleshooting/troubleshooting.html>
- <http://www.pcguide.com/ts/toolsSoftware-c.html>
- <http://www.pcguide.com/ts/toolsSoftware-c.html>

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Learning Experiences

Learning Outcome 4 – Install application software

Learning Activities	Special Instructions
1. Read information sheet on 4.1 (Application Software)	
2. Read information sheet on 4.2 (How to install an application software -Microsoft Office)	Read each Information Sheet and Answer the Self-Check at the end of each Learning Activity. There are Learning Activities that may require you to perform certain Task and Jobs that you have to perform and check your performance based on the performance criteria set. At the completion of this module you will be able to assemble computer hardware.
3. Perform Job Sheet 4.1 – Installing an application software	
4. Check your answer using the Answer Keys below	

INFORMATION SHEET 4.1

Application Software

An application program (app or application for short) is a computer program designed to perform a group of coordinated functions, tasks, or activities for the benefit of the user. Examples of an application include a word processor, a spreadsheet, an accounting application, a web browser, a media player, an aeronautical flight simulator, a console game or a photo editor. The collective noun application software refers to all applications collectively. This contrasts with system software, which is mainly involved with running the computer



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:

- MS Word, WordPad and Notepad
- Internet browsers like Firefox, Safari, and Chrome
- Microsoft Power Point, Keynotes
- Auto CAD
- MySQL, Oracle, MS Access
- Apple Numbers, Microsoft Excel
- Real Player, Media Player, VLC Player
- Dictionaries: Encarta, Britannica Mathematical: MATLAB Others: Google Earth, NASA World Wind
- OpenOffice, Microsoft Office



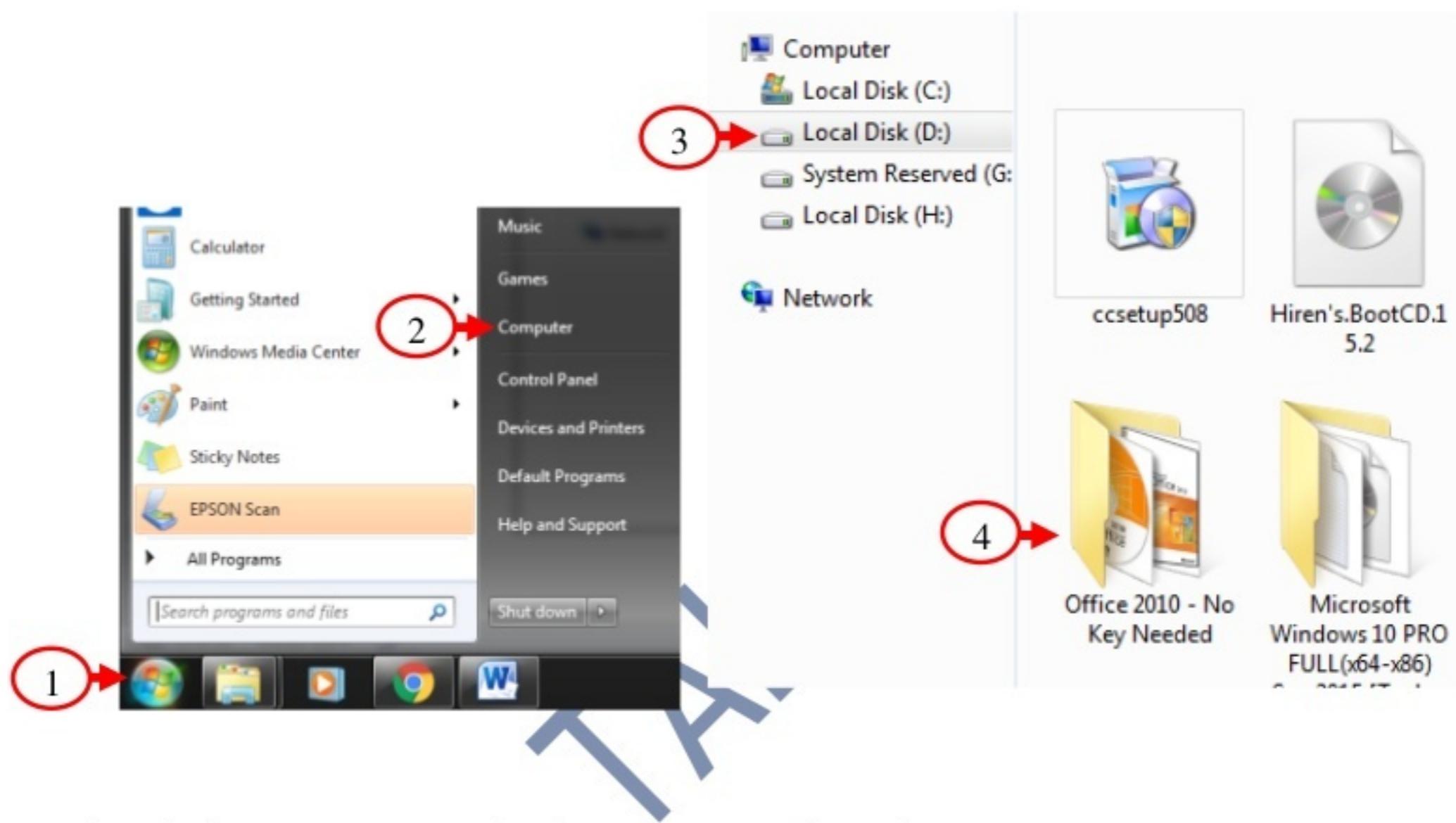
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INFORMATION SHEET 4.2

Installing an Application Software Screenshots

- Installing Microsoft Office (Word, Excel, PowerPoint, Publisher, Access)

Step 1 : Find the installation files and open it at Start>Computer>Local Disk D:>Office 2010



Step 2 : Right click Setup.exe and select Open. Follow the on-screen instruction.

Name	Date modified	Type	Size
Access.en-us	7/4/2017 11:44 AM	File folder	
Admin	7/4/2017 11:44 AM	File folder	
Catalog	7/4/2017 11:44 AM	File folder	
Excel.en-us	7/4/2017 11:44 AM	File folder	
Groove.en-us	7/4/2017 11:44 AM	File folder	
InfoPath.en-us	7/4/2017 11:44 AM	File folder	
Office.en-us	7/4/2017 11:44 AM	File folder	
Office64.en-us	7/4/2017 11:44 AM	File folder	
OneNote.en-us	7/4/2017 11:44 AM	File folder	
Outlook.en-us	7/4/2017 11:44 AM	File folder	
PowerPoint.en-us	7/4/2017 11:44 AM	File folder	
Proofing.en-us	7/4/2017 11:44 AM	File folder	
ProPlus.WW	7/4/2017 11:45 AM	File folder	
Publisher.en-us	7/4/2017 11:45 AM	File folder	
Rosebud.en-us	7/4/2017 11:45 AM	File folder	
Updates	7/4/2017 11:45 AM	File folder	
Word.en-us	7/4/2017 11:45 AM	File folder	
Microsoft Office 2010 Box	10/10/2010 11:35 ...	JPEG image	22 KB
Microsoft Office 2010 DVD Label	10/10/2010 11:35 ...	JPEG image	28 KB
setup	1/22/2010 6:13 PM	Application	1,075 KB

Job Sheet 4.1

Title : Installing an application software (Microsoft Office)

Performance Objective: Prepare the installation files for installing an application software (Microsoft Office)

Tools/Software: Installation software

Equipment : Computer Set

Steps/Procedure:

1. Prepare the installation software
2. Prepare the computer unit
3. Refer to information 4.2 on how to install an Operating System.

Assessment Method: Performance Demonstration.

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Program/ Course: **Computer Systems Servicing**
Unit of Competency: **Install and Configure Computer Systems**

Module: **Installing and Configuring Computer Systems**

Learning Outcome No. 5 **Conduct testing and documentation**

Assessment Criteria:

1. Devices / systems and/or installation is tested to determine whether it conforms to requirements
2. Stress test is conducted to ensure reliability of equipment in accordance with manufacturer's instructions and system requirements
3. 5S and 3Rs are followed according to environmental policies
4. Documentation in relation to the test is forwarded to appropriate personnel and/or authority in accordance with requirements

Resources:

Tools, Materials and Equipment and Facilities

- ICT Laboratory
- Computer Table and Chairs
- Computers
- Printers
- Installation CDs
- And other Computer Accessories

References:

- Sawyer, Stackey G./ Williams, Brian K., Using Information Technology, A Practical Introduction to Computers and Communications International Ed. MC Graw-Hill Higher Education;2000
- Meyers Mike, Introduction to PC Hardware and Troubleshooting, Philippines: McGraw-Hill Education (Asia): 2006
- Marcelo, Antoinette R., Understanding PC Hardware, Philippines: Jemma Inc., 2007
- http://www.pcguide.com/byop/byop_PoweringUptheSystemfortheFirstTime.htm
- <http://www.tekexam.com/StudyGuide/concepts/Troubleshooting/troubleshooting.html>
- <http://www.pcguide.com/ts/toolsSoftware-c.html>
- <http://www.pcguide.com/ts/toolsSoftware-c.html>

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Learning Experiences

Learning Outcome 5 – Conduct testing and documentation

Learning Activities	Special Instructions
1. Read information sheet on 5.1 (Stress testing)	
2. Answer Self Check 5.1	
3. Read information sheet on 5.2 (3Rs and 5s)	
4. Answer Self Check 5.2	
5. Read information sheet 5.3 (Documentation)	Read each Information Sheet and Answer the Self-Check at the end of each Learning Activity. There are Learning Activities that may require you to perform certain Task and Jobs that you have to perform and check your performance based on the performance criteria set. At the completion of this module you will be able to assemble computer hardware.
6. Check your answer using the Answer Keys below	

Information Sheet 5.1

Stress Testing

Stress testing is the process of determining the ability of a computer, network, program or device to maintain a certain level of effectiveness under unfavorable conditions.

How to Stress Test a Computer

1. Close all open programs.
2. Right click the bottom bar (taskbar) on a windows computer and select task manager.
3. If you have a slow internet connection and were looking to test a network intensive program, use the networking tab info; otherwise select the **performance tab**.

The screenshot shows the Windows Task Manager window with the 'Performance' tab selected. The main area displays CPU utilization data for an AMD Athlon(tm) II Dual-Core M320 processor. The graph shows utilization starting at 50% and dropping to around 10% over 60 seconds. Below the graph, detailed processor information is listed:

Utilization	Speed	Maximum speed:	
50%	2.10 GHz	2.10 GHz	
Processes	Threads	Handles	Sockets:
79	1125	31849	1
Logical processors:	Virtualization:	Hyper-V support:	L1 cache:
2	Disabled	Yes	256 KB
Up time	Processor info		
6 days	Core: 2.10 GHz, Cache: 256 KB, Model: AMD Athlon(tm) II Dual-Core M320		

Tips

- Adding more RAM will help your speed. This is because if the processor has more RAM to work with, it can work faster. Adding RAM is usually the first thing you want to do to speed up your computer.

Information Sheet 5.2

3Rs - Reduce, Reuse and Recycle

REDUCE

Reducing - Try to reduce the amount of waste you produce, as this is the best way to help the environment!

REUSE

Reusing - Think of ways you could reuse something

RECYCLE

This enables the materials you throw away to be used again by making them into new products.

5S Methodology

5S is a method for workplace organization which uses a list of five Japanese words

seiri (整理), seiton (整顿), seisō (清扫), seiketsu(清潔),
and shitsuke (躰)

1. Sort (Seiri)

Seiri is sorting through all items and removing all unnecessary items .

2. Set in order (Seiton)

Seiton is putting all necessary items in the optimal place for fulfilling their function in the workplace.

3. Shine/Sweep (Seiso)

Seiton is putting all necessary items in the optimal place for fulfilling their function in the workplace.

4. Seiketsu (Standardise)

Setting up standards and specifications

5. Shitsuke (Sustain)

Sustain the developed processes by self-discipline of the workers.



Self-Check 5.1

1. What is stress testing?
2. What is the advantage of adding RAM to your computer?

Self-Check 5.2

1. What is the meaning of 3Rs
2. Give the Japanese and English term for 5s

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Information Sheet 5.3

Documentation

(Sample Documentation during Computer Disassembly & Assembly)

SAMPLE COMPUTER COMPONENTS WITH SPECIFICATIONS

ITEM NAME	SPECIFICATION	QUANTITY
1. System Case	Mini Tower	1
2. Power Supply	ATX 700 Watts	1
3. Motherboard	Asrock H81m-VG4 Rev 2.0	1
4. CPU	Intel Pentium LGA1150 G2360 3.30 Ghz	1
5. RAM	DDR4 4GB Kingston	2
6. Hard disk	SATA 500 Gb Seagate	1
7. CDROM	None	n/a
8. Video Card	On-board	n/a

Prepared by:

Name & Signature

Checked by:

ERIC M. TALAMISAN
CSS NC II Instructor

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ANSWER KEYS

Self-Check 1.1

1. Wear shoes with non-conductive rubber soles to help reduce the chance of being shocked.
2. Unplug all electronics/equipment from the power source?
3. Do not remove expansion cards or other components a computer when it is turned on.
4. Remove all jewelry when working inside any computer related equipment.
5. Be sure not to mix electronic components and water.
6. Do not over tighten the screws.
7. Always handle computer components by the edges.
8. Wear an anti-static device to prevent Electro Static Discharge.

Self-Check 1.2

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

Self-Check 1.3

1. A computer is an electronic device that helps people perform different task.
2. Four types of computer
 - Supercomputer
 - Mainframe Computer
 - Minicomputer
 - Microcomputer
3. Fundamental Elements of the computer system
 - System Unit
 - Input Device
 - Output Device
4. Examples of Input devices
 - Keyboard
 - Mouse
 - Joystick
 - Scanner
 - Microphone
 - Touch Tablet
 - Handheld scanner
 - Flatbed scanner
 - Camera

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5. Examples of Output devices

- Monitor
- Printer
- Speaker
- Headphones
- Plotter
- Projector

6. Basic Parts of the System Unit

- System Case
- Motherboard
- Central Processing Unit (CPU)
- Random Access Memory (RAM)
- Power Supply
- Hard disk
- CDROM drive
- Expansion Slot

Self-Check 1.3

1. CPU – Central Processing Unit
2. RAM – Random Access Memory
3. HDD – Hard Disk Drive
4. USB – Universal Serial Bus
5. SATA – Serial Advance Technology Attachment
6. IDE – Integrated Drive Electronics
7. I/O – Input/Output
8. BIOS – Basic Input Output System
9. CD – Compact Disc
10. RJ45 – Registered Jack 45

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Self-Check 2.1 & 2.2

1. Common Windows Installer File Extension
 1. Executable - .exe
 2. Microsoft Windows Installation - .msi
 3. Compressed Zip File - .zip
 4. ISO image - .iso

2. What is an installer?

is a computer program that installs files, such as applications, drivers, or other software, onto a computer.

3. What are the steps in preparing bootable USB installer?

1. Prepare the USB Flash Drive
2. *Optional – Format the flash drive by Right clicking on the Removable device and select Format.
3. Open Rufus Application
4. Click the optical drive button next to the Create a bootable disk
5. Search the ISO image which is normally found at Computer>Local Disk D: and click on Open button. (Windows 7 All In one.iso)
6. Finally click on Start button. When prompted click Yes to format flash drive.
7. Warning! All data from the flash drive will be erased during the process.

Self-Check 3.1

1. Three Types of Software

- Operating System
- Application Software
- Programming Language

2. Common Operating systems

- | | |
|--|---|
| <ul style="list-style-type: none">• Windows 7• Windows 8• Windows 10• Windows Server 2008• Windows Server 2012 | <ul style="list-style-type: none">• Windows Server 2016• Corel Linux• MAC OS X• Mandrake Linux |
|--|---|

3. Examples of Application Software

- MS Word, WordPad and Notepad
- Internet browsers like Firefox, Safari, and Chrome
- Microsoft Power Point, Microsoft Excel

4. Examples of Programming Language

- | | |
|---|---|
| <ul style="list-style-type: none">• Java• Ruby• C++• Php | <ul style="list-style-type: none">• Visual Basic• Python• Perl• C# |
|---|---|

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Self-Check 3.2

Matching Type

1. Application Software
2. Programming Language
3. Application Software
4. Operating System
5. Application Software
6. Programming Language
7. Programming Language
8. Operating System
9. Operating System
10. Application Software

Self-Check 3.3

1. Enumerate the steps in installing an Operating System (OS) – Windows 7

- Step 1 : Insert bootable USB installer
Step 2 : Power on PC
Step 3 : Press BIOS setup key repeatedly (Depends on PC Brand: F1, F2, Del)
Step 4 : Arrange Boot Order, Boot Sequence, Start-up device or something similar, making the USB/Removable device our First boot option:
 1st Boot – USB installer
 2nd Boot – Hard Disk
Step 5 : Save the new settings by pressing F10, Esc (Depends on BIOS).
 Confirm by selecting Yes.
Step 6: Quickly press any key to boot from USB.
Step 7: Click on Next to continue
Step 8 : Click on Install Now
Step 9 : Check on I accept... and click Next
Step 10: Select custom installation
Step 11 : Delete and create partition and click Next
Step 12 : Wait for the installation to finish

2. Give the four ways on how to install device drivers
- Manufacturer's CD/DVD Installer
 - Driver Pack Solution
 - Device Manager (Update Driver Software)
 - Download on-line
3. How do you access device manager?
- Click on the Windows Start button
 - Search for Device Manager

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Self-Check 5.1

1. What is stress testing?

Stress testing is the process of determining the ability of a computer, network, program or device to maintain a certain level of effectiveness under unfavorable conditions.

2. What is the advantage of adding RAM to your computer?

Adding RAM will speed up your computer. This is because if the processor has more RAM to work with, it can work faster.

Self-Check 5.2

1. What is the meaning of 3Rs

Reduce, Reuse, Recycle

2. Give the Japanese and English term for 5s

Japanese

- Seiri
- Seiton
- Seiso
- Seiketsu
- Shitsuke

English

- Sort
- Set in order
- Sweep/Shine
- Standardise
- Sustain

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