



Competency Based Learning Materials (CBLM)

IT Support Service

Level-3

Module: Performing PC Assembling

Code: CBLM-OU-ICT-02-L3-V1



**National Skills Development Authority
Prime Minister's Office
Government of the People's Republic of Bangladesh**

Copyright

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This Competency Based Learning Materials (CBLM) on “Performing PC Assembling” under the IT Support Service, Level-3 qualification is developed based on the national competency standard approved by National Skills Development Authority (NSDA)

This document is to be used as a key reference point by the competency-based learning materials developers, teachers/trainers/assessors as a base on which to build instructional activities.

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This Competency Based Learning Materials is a document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the document for providing training consistent with the requirements of industry in order to meet the qualification of individuals who graduated through the established standard via competency-based assessment for a relevant job.

This document has been developed by NSDA in association with industry representatives, academia, related specialist, trainer and related employee.

Public and private institutions may use the information contained in this CBLM for activities benefitting Bangladesh.

List of Abbreviations

CS	- Competency Standard
ISC	- Industry Skills Council
NSDA	- National Skills Development Authority
NSQF	- National Skills Qualifications Framework
BNQF	- Bangladesh National Qualifications Framework
OSH	- Occupational Safety and Health
PPE	- Personal Protective Equipment
SCVC	- Standards and Curriculum Validation Committee
STP	- Skills Training Provider
SOP	- Standard Operating Procedure
UoC	- Unit of Competency
EC	- Executive Committee
CBT&A	- Competency based Training & Assessment
CBC	- Competency based Curriculum
CAD	- Course Accreditation Document
CBLM	- Competency Based Learning Materials
RAM	- Random Access Memory
CMOS	- Complementary Metal-Oxide-Semiconductor
ROM	- Read Only Memory
SSD	- Solid State Drive
HDD	- Hard Disk
NVMe	- Non-Volatile Memory Express
BIOS	- Basic Input Output System.
CPU	- Central Processing Unit
GPU	- Graphics Processing Unit
PSU	- Power Supply Unit

How to use this Competency Based Learning Materials (CBLMs)

The module, Performing PC Assembling contains training materials and activities for you to complete. These activities may be completed as part of structured classroom activities or you may be required you to work at your own pace. These activities will ask you to complete associated learning and practice activities in order to gain knowledge and skills you need to achieve the learning outcomes.

1. Review the **Learning Activity** page to understand the sequence of learning activities you will undergo. This page will serve as your road map towards the achievement of competence.
2. Read the **Information Sheets**. This will give you an understanding of the jobs or tasks you are going to learn how to do. Once you have finished reading the **Information Sheets** complete the questions in the **Self-Check**.
3. **Self-Checks** are found after each **Information Sheet**. **Self-Checks** are designed to help you know how you are progressing. If you are unable to answer the questions in the **Self-Check** you will need to re-read the relevant **Information Sheet**. Once you have completed all the questions check your answers by reading the relevant **Answer Keys** found at the end of this module.
4. Next move on to the **Job Sheets**. **Job Sheets** provide detailed information about *how to do the job* you are being trained in. Some **Job Sheets** will also have a series of **Activity Sheets**. These sheets have been designed to introduce you to the job step by step. This is where you will apply the new knowledge you gained by reading the Information Sheets. This is your opportunity to practice the job. You may need to practice the job or activity several times before you become competent.
5. Specification **sheets**, specifying the details of the job to be performed will be provided where appropriate.
6. A review of competency is provided on the last page to help remind if all the required assessment criteria have been met. This record is for your own information and guidance and is not an official record of competency

When working through this Module always be aware of your safety and the safety of others in the training room. Should you require assistance or clarification please consult your trainer or facilitator.

When you have satisfactorily completed all the Jobs and/or Activities outlined in this module, an assessment event will be scheduled to assess if you have achieved competency in the specified learning outcomes. You will then be ready to move onto the next Unit of Competency or Module

Approved by ___ th Authority Meeting of NSDA Held on -----

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MODULE CONTENT

MODULE CONTENT

Unit of Competency	Perform PC Assembling
Unit Code	OU-ICT-ITSS-02-L3-V1
Module Title	Performing PC Assembling
Module Descriptor	This module discusses the aspects that must be given attention when Performing PC Assembling. It shows the knowledge and skills requirements for preparing for assemble, disassembling hardware components, assembling hardware components and modifying BIOS setting
Nominal Hours	70 Hours
Lerning Outcome	After completion of this module the trainees must be able to: <ol style="list-style-type: none">1. Prepare for assemble2. Disassemble hardware components3. Assemble hardware components4. Modify BIOS setting5. Store and clean tools and equipment

Assessment Criteria:

1. PPE is used and safe work practice is followed
2. PC equipment is Isolated from electrical source when assembling
3. Electrostatic discharge precautions are observed at all times
4. Safe work practice observed and personal protective equipment (PPE) worn as required for the work performed
5. Tools and equipment are selected as required
6. PC are collected for disassemble
7. Tools are collected as required
8. PC is disassembled
9. Components of user PC are identified and documented
10. Components of PC are collected
11. Tools are collected for assemble as required
12. Components of PC are assembled
13. Pc is connected with the power source
14. Performance of the PC is checked
15. Date and time are adjusted
16. Correct processor and memory clock frequency is chosen
17. Storage device and optical drive interface is selected correctly
18. System information is checked and verified from BIOS
19. Tools and equipment are cleaned and stored as per workplace standard
20. Workplace is cleaned

Learning Outcome 1: Prepare for Assemble

Assessment Criteria:

1. PPE is used and safe work practice is followed
2. PC equipment is Isolated from electrical source when assembling
3. Electrostatic discharge precautions are observed at all times
4. Safe work practice observed and personal protective equipment (PPE) worn as required for the work performed
5. Tools and equipment are selected as required

Content:

1. PPE
2. Safe work practice
3. PC equipment
4. Electrostatic discharge precautions
5. Tools and equipment

Resources Required/ Conditions:

The trainees must be provided with the following:

- Handouts or reference materials/books/ CBLMs on the above stated contents
- PCs/printers or laptop/printer with internet access
- Digital projector and Screen
- Bond paper
- Ball pens/pencils and other office supplies and materials
- Relevant learning materials
- Workplace or simulated environment

Methodologies

- Lecture/discussion
- Demonstration/application
- Presentation
- Blended delivery methods

Assessment Methods

- Written test
- Demonstration
- Observation with checklist
- Oral questioning
- Portfolio

Learning Experience 1: Prepare for Assemble

In order to achieve the objectives stated in this learning guide, you must perform the learning steps below. Beside each step are the resources or special instructions you will use to accomplish the corresponding activity.

Learning Steps	Resources specific instructions
1. Trainee will ask the instructor about Prepare for assemble	1. Instructor will provide the learning materials “Performing PC Assembling”
2. Read the Information sheet/s	2. Information Sheet No: 1 Prepare for assemble
3. Complete the Self Checks & Check answer sheets.	3. Self-Check/s Self-Check No: 1 Prepare for assemble Answer key No. 1 Prepare for assemble
4. Read the Job Sheet and Specification Sheet and perform job	4. Job- Sheet No: 1- Prepare for assemble Specification Sheet 1 – Prepare for assemble

Information Sheet 1: Prepare for assemble

Learning Objectives:

After completion of this information sheet, the learners will be able to:

- 1.1 Use PPE and follow safe work practice
- 1.2 Isolate PC equipment from electrical source when assembling
- 1.3 Observe Electrostatic discharge precautions at all times
- 1.4 Observe Safe work practice and wear personal protective equipment (PPE) as required for the work performed
- 1.5 Select Tools and equipment as required.

1.1 PPE

When assembling hardware components of a personal computer, it's essential to ensure personal safety by using appropriate Personal Protective Equipment (PPE). While assembling a computer doesn't typically involve high-risk activities, there are still potential hazards to consider, such as electrical shock, sharp edges, and small parts that could cause injury. Here are the recommended PPE for assembling hardware components of a personal computer:

- **Anti-Static Wrist Strap:** An anti-static wrist strap is essential to prevent electrostatic discharge (ESD) from damaging sensitive computer components, such as the motherboard, CPU, or RAM. It grounds you to the computer case, dissipating any built-up static charge from your body.
- **Safety Glasses:** Safety glasses or goggles protect your eyes from small debris, metal shavings, or dust that may be generated during the assembly process. They also provide a barrier against accidental splashes or spills of cleaning solvents or thermal paste.
- **Gloves:** Although not always necessary, gloves can provide protection against sharp edges or cuts from metal components, such as the computer case or expansion cards. Additionally, gloves can help maintain a better grip on slippery components and prevent smudges or fingerprints on sensitive surfaces.
- **Closed-Toe Shoes:** Closed-toe shoes with non-slip soles provide protection against potential injuries from dropping heavy components or stepping on sharp objects. They also reduce the risk of static buildup and protect your feet from accidental spills or falls.
- **ESD-Safe Mat:** While not personal protective equipment worn on the body, an ESD-safe mat provides a static-dissipative surface to work on, reducing the risk of ESD damage to computer components. It also protects the work surface from scratches and prevents components from sliding around.
- **Long-Sleeved Clothing:** Wearing long-sleeved clothing can help prevent scratches, cuts, or abrasions to your arms from sharp edges or protruding components. Additionally, long sleeves provide an extra layer of protection against accidental spills or splashes.
- **Mask (Optional):** If working in a dusty or poorly ventilated environment, wearing a mask can help prevent inhalation of airborne particles or dust. This is

1.2 PC equipment

PC equipment refers to the hardware components and peripherals that make up a personal computer (PC) system. These components work together to enable users to perform various tasks such as computing, communication, and multimedia activities.

When assembling PC equipment, we need to isolate from electrical source.

it's essential to isolate PC equipment from an electrical source when assembling or working on a computer system to ensure personal safety and prevent damage to components.

Importance of Isolating PC Equipment:

Electrical Safety:

Isolating PC equipment from an electrical source helps prevent the risk of electric shock or injury, especially when working with exposed components or conducting tasks that involve handling internal hardware.

Component Protection:

Turning off the power and unplugging the computer from the electrical outlet protects sensitive components from potential damage caused by electrical surges or accidental contact with live circuits.

Prevention of Short Circuits:

Disconnecting the power source reduces the risk of short circuits or electrical faults that could occur when manipulating components or connecting/disconnecting cables within the computer system.

Safe Handling of Components:

Isolating the PC equipment ensures a safer environment for handling and installing hardware components, minimizing the risk of static discharge or accidental damage during assembly.

How to Isolate PC Equipment:

Turn Off Power:

Shut down the computer system properly by selecting the "Shut Down" option from the operating system's menu. Ensure that all applications are closed, and the system is completely powered down before proceeding.

Unplug Power Cord:

After shutting down the computer, unplug the power cord from the electrical outlet to cut off the power supply to the system. This prevents any residual electrical charge from remaining in the system and eliminates the risk of electric shock.

Disconnect Peripherals:

Disconnect any external peripherals or devices connected to the computer, such as monitors, printers, external drives, and networking equipment. This ensures that all components are isolated from the power source during assembly.

Press Power Button (Optional):

Some PC systems may have a power button on the chassis or power supply unit. Pressing this button after unplugging the power cord helps discharge any remaining electrical charge stored in capacitors within the system.

Wait for Capacitor Discharge (Optional):

After disconnecting the power source, wait for a few moments to allow capacitors in the system to discharge completely. This helps ensure that there is no residual electrical charge present before handling internal components.

1.3 Electrostatic discharge (ESD) precautions

Electrostatic discharge (ESD) precautions are essential measures taken to prevent damage to sensitive electronic components caused by static electricity. ESD can occur when two objects with different electrical charges come into contact or when there is an imbalance of electric charge on the surface of an object. This discharge can potentially damage or destroy electronic components, particularly those in computers, if proper precautions are not taken. Here's how to mitigate the risk of ESD when working with electronic components:

Ground Yourself:

Before handling electronic components, ground yourself to discharge any static electricity accumulated on your body. Use an anti-static wrist strap or heel strap connected to a grounding point, such as the computer case or an ESD mat.

Use ESD-Safe Workstation:

Work on an ESD-safe workstation equipped with an anti-static mat and wrist strap. The anti-static mat provides a conductive surface to dissipate static charge, while the wrist strap connects you to ground to prevent ESD.

Handle Components Carefully:

Handle electronic components, such as CPUs, RAM modules, and expansion cards, by their edges or non-conductive surfaces. Avoid touching the exposed contacts or circuitry to minimize the risk of ESD damage.

Use ESD-Safe Tools:

Use ESD-safe tools, including screwdrivers, pliers, and tweezers, when working with electronic components. These tools are made of static-dissipative materials to prevent ESD discharge.

Avoid Synthetic Clothing:

Wear clothing made of natural fibers such as cotton, which do not generate as much static electricity as synthetic materials like polyester or nylon. Synthetic clothing can build up static charge and increase the risk of ESD.

Minimize Movement:

Minimize unnecessary movement and friction when handling electronic components, as this can generate static electricity. Move slowly and deliberately to avoid generating static charge.

Ground Work Surfaces and Equipment:

Ensure that work surfaces, tools, and equipment are properly grounded to prevent the buildup of static electricity. Use grounding straps or cables to connect these items to a reliable ground point.

Assembling hardware components of a personal computer requires specific tools and equipment to ensure a smooth and efficient assembly process. Here's a list of the essential tools and equipment needed for assembling hardware components of a personal computer:

Screwdriver Set:

A screwdriver set with various sizes and types of screwdrivers (Phillips, flathead, and Torx) is essential for assembling and securing hardware components such as the motherboard, power supply, drives, and expansion cards.

Anti-Static Wrist Strap:

An anti-static wrist strap helps prevent electrostatic discharge (ESD) from damaging sensitive electronic components. It grounds you to the computer case or an ESD-safe surface, dissipating static charge from your body.



1.4 PC Toolkit: A PC toolkit or computer repair kit typically includes specialized tools and accessories for working on computer hardware. These may include tweezers, pliers, hex keys, cable ties, and other tools specific to computer assembly and maintenance.



Flashlight or Headlamp:

A flashlight or headlamp provides additional illumination when working in dimly lit areas inside the computer case or when inspecting components in tight spaces.



Cable Management Tools:

Cable management tools such as cable ties, Velcro straps, and cable clips help organize and secure cables inside the computer case, ensuring proper airflow and reducing cable clutter.



Thermal Paste (Optional):

Thermal paste is used to improve thermal conductivity between the CPU and heatsink, ensuring efficient heat dissipation. It may be necessary when installing or reseating the CPU cooler.



Phillips Screw Holder (Optional):

A Phillips screw holder or magnetic screwdriver can be useful for holding screws in place and preventing them from falling into tight spaces inside the computer case.



Compressed Air Duster:

A can of compressed air duster is handy for removing dust and debris from computer components, fans, and heatsinks. It helps maintain optimal airflow and cooling performance.

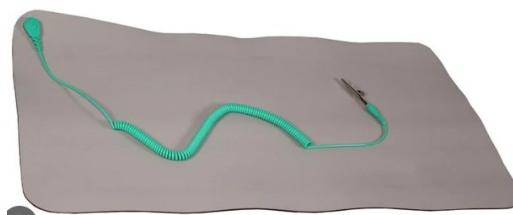


CPU Installation Tool (Optional):

Some CPU coolers come with installation tools or brackets to facilitate the mounting process. These tools can simplify the installation of CPU coolers, especially those with complex mounting mechanisms.

Static-Free Work Surface:

Working on a static-free work surface, such as an anti-static mat or grounded workbench, helps prevent electrostatic discharge and protects sensitive components from ESD damage.



Instruction Manual and Documentation:

Refer to the instruction manuals, user guides, and documentation provided with each hardware component for assembly instructions, compatibility guidelines, and troubleshooting tips.

Self-Check Sheet 1: Prepare for assemble

1. Why is it important to use Personal Protective Equipment (PPE) when assembling PC components?
2. What are examples of PPE commonly used when assembling PC equipment?
3. Why should PC equipment be isolated from an electrical source during assembly?
4. What is the purpose of observing electrostatic discharge precautions during PC assembly?
5. How can you ground yourself when working with PC components?
6. What should you do before handling PC components to minimize the risk of ESD?
7. Why is it important to observe safe work practices during PC assembly?
8. What tools are essential for assembling PC components?
9. How should you select tools and equipment for PC assembly?
10. What precautions should you take when using compressed air dusters during PC assembly?

Answer Key 1: Prepare for assemble

1. Why is it important to use Personal Protective Equipment (PPE) when assembling PC components?
Answer: Using PPE protects against potential hazards such as electrical shock, cuts, and eye injuries.
2. What are examples of PPE commonly used when assembling PC equipment?
Answer: Examples include anti-static wrist straps, safety glasses, gloves, and closed-toe shoes.
3. Why should PC equipment be isolated from an electrical source during assembly?
Answer: Isolating PC equipment prevents the risk of electric shock and damage to components from electrical surges.
4. What is the purpose of observing electrostatic discharge precautions during PC assembly?
Answer: Electrostatic discharge precautions prevent damage to sensitive electronic components from static electricity.
5. How can you ground yourself when working with PC components?
Answer: Ground yourself by wearing an anti-static wrist strap connected to the computer case or an ESD-safe mat.
6. What should you do before handling PC components to minimize the risk of ESD?
Answer: Before handling components, discharge any static electricity by touching a grounded metal object.
7. Why is it important to observe safe work practices during PC assembly?
Answer: Observing safe work practices reduces the risk of accidents, injuries, and damage to equipment.
8. What tools are essential for assembling PC components?
Answer: Essential tools include screwdrivers, anti-static wrist straps, cable management tools, and thermal paste.
9. How should you select tools and equipment for PC assembly?
Answer: Select tools and equipment based on the specific tasks involved, ensuring they are appropriate and in good condition.
10. What precautions should you take when using compressed air dusters during PC assembly?
Answer: When using compressed air dusters, hold the can upright and use short bursts to prevent liquid from spraying onto components

Activity Sheet 1.1:

Activity Sheet 1.0: Prepare for assemble hardware components of a personal computer.
Title: Identify Learning Resources
Performance Objective: At the end of this task, the trainee should be able to:
<ol style="list-style-type: none">1. Demonstrate the proper use of anti-static wrist straps and other PPE.2. Identify and explain the purpose of each component required for PC assembly, including the motherboard, CPU, RAM, storage drives, power supply, and peripherals.3. Select and collect tools and equipment based on the tasks involved in PC assembly.4. Collect Materials Needed for pc assembling.
Tools and Materials Required:
<ul style="list-style-type: none">• List of available learning resources
<ul style="list-style-type: none">• Knowledge of target learners
<ul style="list-style-type: none">• Notebook/Paper for note-taking
<ul style="list-style-type: none">• Pens/Markers
<ul style="list-style-type: none">• Screwdriver Set
<ul style="list-style-type: none">• Anti-Static Wrist Strap
<ul style="list-style-type: none">• PC Toolkit:
<ul style="list-style-type: none">• Flashlight or Headlamp
<ul style="list-style-type: none">• Cable Management Tools
<ul style="list-style-type: none">• Thermal Paste (Optional)
<ul style="list-style-type: none">• Phillips Screw Holder (Optional)
<ul style="list-style-type: none">• Compressed Air Duster
<ul style="list-style-type: none">• CPU Installation Tool (Optional)
<ul style="list-style-type: none">• Cable Tester (Optional)
<ul style="list-style-type: none">• Static-Free Work Surface
Equipment:
<ul style="list-style-type: none">• Desktop Computer

Learning Outcome 2: Disassemble hardware components

Assessment Criteria:

- 2.1 PC are collected for disassemble
- 2.2 Tools are collected as required
- 2.3 PC is disassembled
- 2.4 Components of user PC are identified and documented

Content:

1. PC disassemble procedure
2. PC assemble procedure
3. Components of user PC

Resources Required/ Conditions:

The trainees must be provided with the following:

- Handouts or reference materials/books/ CBLMs on the above stated contents
- PCs/printers or laptop/printer with internet access
- Digital projector and Screen
- Bond paper
- Ball pens/pencils and other office supplies and materials
- Relevant learning materials
- Workplace or simulated environment

Methodologies

- Lecture/discussion
- Demonstration/application
- Presentation
- Blended delivery methods

Assessment Methods

- Written test
- Demonstration
- Observation with checklist
- Oral questioning
- Portfolio

Learning Experience 2: Disassemble hardware components

In order to achieve the objectives stated in this learning guide, you must perform the learning steps below. Beside each step are the resources or special instructions you will use to accomplish the corresponding activity.

Learning Steps	Resources specific instructions
1. Student will ask the instructor about Disassemble hardware components	1. Instructor will provide the learning materials “Performing PC Assembling”
2. Read the Information sheet/s	2. Information Sheet No: 2 Disassemble hardware components
3. Complete the Self Checks & Check answer sheets.	3. Self-Check/s Self-Check No: 2 - Disassemble hardware components Answer key No. 2 - Disassemble hardware components
4. Read the Job Sheet and Specification Sheet and perform job	4. Job- Sheet No: 2 - Disassemble hardware components Specification Sheet: 2- Disassemble hardware components

Information Sheet 2: Disassemble Hardware Components

Learning Objectives:

After completion of this information sheet, the learners will be able to:

- 2.1 Collect PC for disassemble
- 2.2 Collect Tools as required
- 2.3 Disassemble PC
- 2.4 Identify and document Components of user PC

To disassemble a PC at first, we have to collect PC for disassemble.

For Disassembling hardware components of a personal computer requires specific tools and equipment to ensure a smooth and efficient disassembling process.

List of the essential tools and equipment needed for disassembling hardware components of a personal computer:

1. Screwdriver Set
2. Anti-Static Wrist Strap
3. PC Toolkit
4. Flashlight or Headlamp
5. Cable Management Tools
6. Phillips Screw Holder (Optional)
7. Compressed Air Duster
8. Static-Free Work Surface

2.1 PC disassemble procedure:

Disassembling a personal computer (PC) involves carefully removing its various components for maintenance, upgrades, or troubleshooting purposes. Here's a step-by-step guide on how to disassemble a PC safely and efficiently:

Prepare the Workspace:

Choose a clean, well-lit workspace with ample room to spread out components.

Ensure the workspace is free from static electricity and potential hazards.

Power Off and Disconnect:

Shut down the computer properly from the operating system.

Unplug the power cord from the electrical outlet and disconnect all peripheral devices (monitor, keyboard, mouse, etc.).

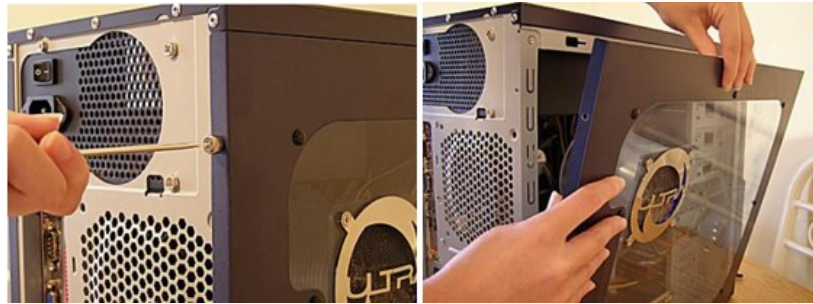
Ground Yourself:

Wear an anti-static wrist strap connected to a grounded surface or wear anti-static gloves to prevent electrostatic discharge (ESD) damage to components.

Open the Case:

Remove the screws or latches securing the side panels of the computer case.

Slide or lift off the side panels to expose the internal components.



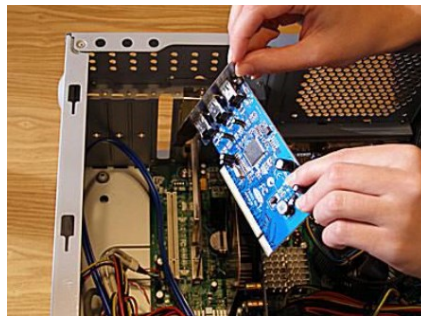
Disconnect Power Supply:

Unplug the power connectors from the motherboard, drives, and any other components powered by the power supply unit (PSU).

Disconnect any auxiliary power cables such as PCIe power connectors for graphics cards.

Remove Expansion Cards:

Unscrew and remove expansion cards such as graphics cards, sound cards, and network adapters from their respective slots on the motherboard.



Press down on the release latch (if applicable) and gently pull the card out of the slot.

Disconnect Drives:

Disconnect data and power cables from hard disk drives (HDDs), solid-state drives (SSDs), optical drives (CD/DVD drives), and any other storage devices.



Remove RAM Modules:

Press down on the clips at either end of each RAM module to release it from the motherboard.

Gently pull the RAM modules out of their slots, taking care not to touch the gold contacts.



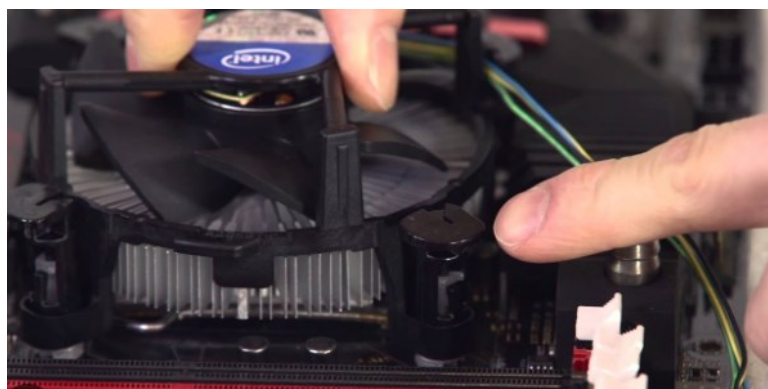
Unplug Cables and Connectors:

Unplug all cables and connectors attached to the motherboard, including SATA cables, front panel connectors, USB headers, and audio connectors.



Remove CPU Cooler:

- If necessary, unscrew and remove the CPU cooler from the CPU socket. Follow the manufacturer's instructions for detaching the cooler from the CPU and motherboard.



Remove Motherboard:

- Unscrew the motherboard mounting screws securing it to the case.

- Lift the motherboard carefully out of the case, being mindful of any cables or connectors still attached to it.



Inspect and Clean Components:

- Inspect each component for dust buildup, damage, or signs of wear.
- Use compressed air or a soft brush to gently clean dust from components, fans, and heatsinks.

Organize and Store Components:

- Organize disassembled components neatly and store them in a safe place to prevent damage or loss.
- Label cables and connectors if necessary to ensure proper reassembly.

Documenting the components of a user's PC

Documenting the components of a user's PC is essential for maintenance, upgrades, and troubleshooting purposes. Here's how you can identify and document the components of a user's PC:

Motherboard:

Identify the motherboard model and manufacturer by visually inspecting the motherboard or using system information tools such as CPU-Z or Speccy.

Document details such as the chipset, form factor, socket type, and supported RAM type and capacity.

Central Processing Unit (CPU):

Determine the CPU model and specifications by checking system information tools or referring to the CPU itself.

Document details such as the CPU model, socket type, base clock speed, number of cores, and thermal design power (TDP).

Random Access Memory (RAM):

Identify the RAM modules installed in the system by visually inspecting them or using system information tools.

Document details such as the RAM capacity, type (DDR3, DDR4), speed (MHz), and number of modules installed.

Storage Drives:

Identify the storage drives (HDDs, SSDs) installed in the system by checking drive bays or using system information tools.

Document details such as the drive capacity, type (HDD or SSD), interface (SATA, NVMe), and model number.

Graphics Card (GPU):

Identify the graphics card installed in the system by visually inspecting it or using system information tools.

Document details such as the GPU model, manufacturer, memory capacity, interface (PCIe), and clock speeds.

Power Supply Unit (PSU):

Identify the power supply unit installed in the system by visually inspecting it or checking its model sticker.

Document details such as the wattage, efficiency rating, form factor, and modular/non-modular design.

Case and Cooling:

Identify the PC case and cooling components (fans, CPU cooler) by visually inspecting them.

Document details such as the case model, form factor, number of fan mounts, and type of cooling solution.

Peripherals:

Identify peripherals such as monitors, keyboards, mice, printers, and external drives connected to the PC.

Document details such as the peripheral model, manufacturer, and connection type (USB, HDMI, etc.).

Operating System and Software:

Document the operating system installed on the PC, including the version and edition (Windows, macOS, Linux).

Document any installed software applications, including their versions and licenses.

Network and Connectivity:

Identify network adapters (Ethernet, Wi-Fi) and other connectivity options (Bluetooth, USB) available on the PC.

Document details such as the network adapter model, interface type, and connection status.

Self-Check Sheet 2: Disassemble hardware components

1. Why is it important to collect the PC for disassembly before beginning the process?
2. What tools are typically required for disassembling a PC?
3. Why is it essential to follow safe work practices during the disassembly of a PC?
4. What steps are involved in disassembling a PC?
5. Why is it important to identify and document the components of a user's PC?
6. What tools should be collected before beginning the disassembly process?
7. How can you ensure the safe disassembly of a PC?
8. What are some common components of a user's PC that need to be identified and documented?
9. What information should be documented when identifying PC components?
10. Why is it important to document the components of a user's PC accurately?

Answer Key 2: Disassemble Hardware Components

1. Why is it important to collect the PC for disassembly before beginning the process?
Answer: Collecting the PC ensures all necessary components are available and ready for disassembly, streamlining the process and minimizing interruptions.
2. What tools are typically required for disassembling a PC?
Answer: Tools required for disassembling a PC may include screwdrivers, anti-static wrist straps, pliers, cable management tools, and compressed air dusters.
3. Why is it essential to follow safe work practices during the disassembly of a PC?
Answer: Following safe work practices prevents accidents, injuries, and damage to components during the disassembly process, ensuring a smooth and hazard-free experience.
4. What steps are involved in disassembling a PC?
Answer: Steps for disassembling a PC typically include powering off the system, disconnecting all cables, removing the side panels, disconnecting components, and carefully removing the motherboard.
5. Why is it important to identify and document the components of a user's PC?
Answer: Identifying and documenting PC components helps with maintenance, upgrades, and troubleshooting by providing a clear understanding of the system's configuration and specifications.
6. What tools should be collected before beginning the disassembly process?
Answer: Tools such as screwdrivers, pliers, anti-static wrist straps, and cable management tools should be collected to ensure a smooth disassembly process.
7. How can you ensure the safe disassembly of a PC?
Answer: Ensure the PC is powered off and disconnected from all power sources before beginning the disassembly process. Use proper tools and follow safety precautions to avoid damage to components and injury.
8. What are some common components of a user's PC that need to be identified and documented?
Answer: Common components include the motherboard, CPU, RAM, storage drives (HDDs/SSDs), graphics card, power supply unit (PSU), cooling components, and peripherals.

Task Sheet 2.1: Disassemble Hardware Components

TASK SHEET 2.1
Title: Disassemble Hardware Components
Performance Objective: At the end of this task, the trainee should be able to Disassemble Hardware Components. Following the steps and procedures given below.
<p>A. Supplies Documents</p> <ul style="list-style-type: none">▪ User Manuals <p>B. Tools and Material required:</p> <ul style="list-style-type: none">▪ Notebook▪ Screwdriver Set▪ Anti-Static Wrist Strap▪ PC Toolkit▪ Flashlight or Headlamp▪ Cable Management Tools▪ Thermal Paste (Optional)▪ Phillips Screw Holder (Optional)▪ Compressed Air Duster▪ CPU Installation Tool (Optional)▪ Static-Free Work Surface <p>C. Equipment:</p> <ul style="list-style-type: none">▪ Desktop Computer
<p>Steps/Procedures:</p> <ol style="list-style-type: none">1. Follow the given template of work plan in information sheet.2. In paper and pen, identify your project name (project title), its purpose, time frame and budgetary requirement.3. Prepare your workspace4. Power down and unplug5. Remove the side panel6. Ground yourself7. Disconnect cables8. Remove expansion cards9. Remove drives10. Remove memory (RAM)11. Remove CPU cooler12. Remove the motherboard13. Clean components (if required)14. Organize and store parts

Learning Outcome 3: Assemble hardware components

Assessment Criteria:

1. Components of PC are collected
2. Tools are collected for assemble as required
3. Components of PC are assembled
4. Pc is connected with the power source
5. Performance of the PC is checked

Content:

1. Components of PC
2. required Tools for assemble
3. Performance checking procedure of the PC.

Resources Required/ Conditions:

The trainees must be provided with the following:

- Handouts or reference materials/books/ CBLMs on the above stated contents
- PCs/printers or laptop/printer with internet access
- Digital projector and Screen
- Bond paper
- Ball pens/pencils and other office supplies and materials
- Relevant learning materials
- Workplace or simulated environment

Methodologies

- Lecture/discussion
- Demonstration/application
- Presentation
- Blended delivery methods

Assessment Methods

- Written test
- Demonstration
- Observation with checklist
- Oral questioning
- Portfolio

Learning Experience 3: Assemble Hardware Components

In order to achieve the objectives stated in this learning guide, you must perform the learning steps below. Beside each step are the resources or special instructions you will use to accomplish the corresponding activity.

Learning Steps	Resources specific instructions
1. Student will ask the instructor about Assemble hardware components	1. Instructor will provide the learning materials “Performing PC Assembling”
2. Read the Information sheet/s	2. Information Sheet No 3: Assemble hardware components
3. Complete the Self Checks & Check answer sheets.	3. Self-Check/s Self-Check No 3: Assemble hardware components Answer key No. 3: Assemble hardware components
4. Read the Job Sheet and Specification Sheet and perform job	4. Job- Sheet No 3-1: Assemble hardware components Specification Sheet 3-1: Assemble hardware components

Information Sheet 3: Assemble Hardware Components

Learning Objectives:

After completion of this information sheet, the learners will be able to:

- 3.1 Collect components of PC
- 3.2 Collect tools for assemble as required
- 3.3 Assemble components of PC
- 3.4 Connect Pc with the power source
- 3.5 Check Performance of the PC.

3.1 Collect components of PC: To assemble hardware components of a PC at first, we have to collect PC for assemble.

For assembling hardware components of a personal computer requires specific tools and equipment to ensure a smooth and efficient disassembling process.

3.2 List of the essential tools and equipment needed for disassembling hardware components of a personal computer:

- Screwdriver Set
- Anti-Static Wrist Strap
- PC Toolkit
- Flashlight or Headlamp
- Cable Management Tools
- Thermal Paste (Optional)
- Phillips Screw Holder (Optional)
- Compressed Air Duster
- CPU Installation Tool (Optional)
- Static-Free Work Surface

3.3 PC assemble procedure

Assembling a personal computer (PC) involves putting together various hardware components to create a functional system. Here's a step-by-step guide on how to assemble a PC safely and efficiently:

Prepare the Workspace:

Choose a clean, well-lit workspace with enough room to work comfortably.

Ensure the workspace is free from static electricity and potential hazards.

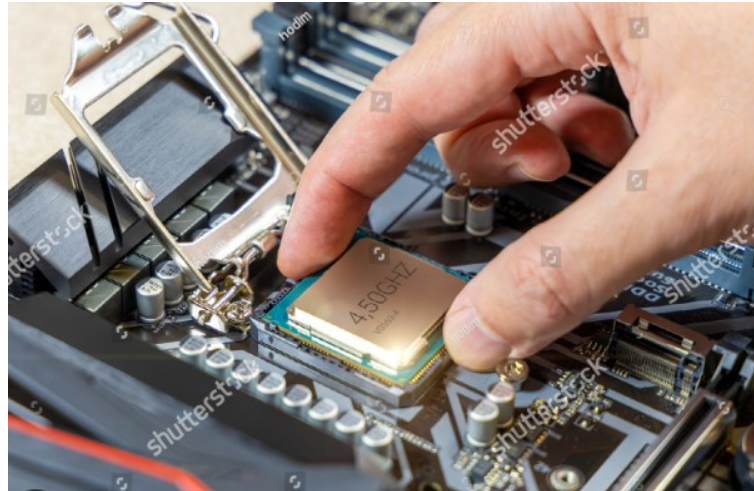
Gather Components:

Collect all necessary hardware components for the build, including the motherboard, CPU, RAM, storage drives, power **supply** unit (PSU), case, and peripherals.

Install CPU:

Open the CPU socket on the motherboard and carefully insert the CPU, aligning the notches or markers.

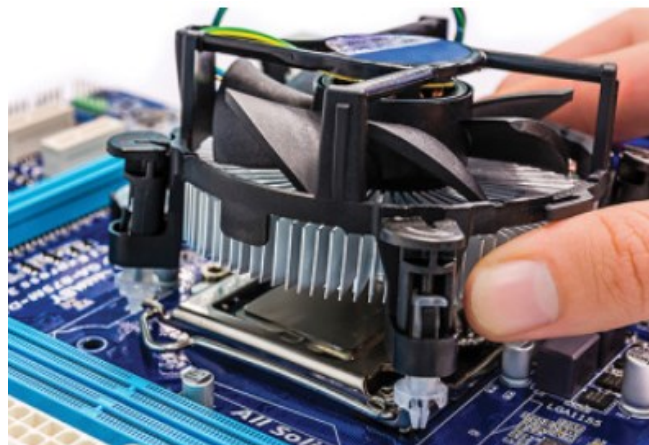
Close the socket retention mechanism to secure the CPU in place.



Install CPU Cooler:

Apply thermal paste to the CPU (if necessary) and install the CPU cooler according to the manufacturer's instructions.

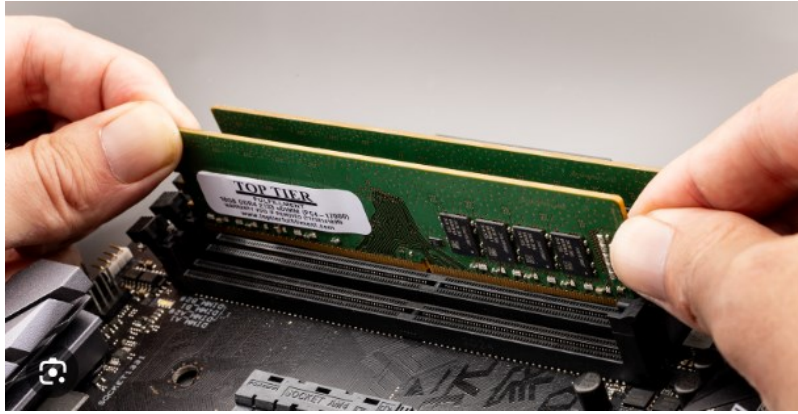
Secure the CPU cooler in place using the provided mounting mechanism or screws.



Install RAM:

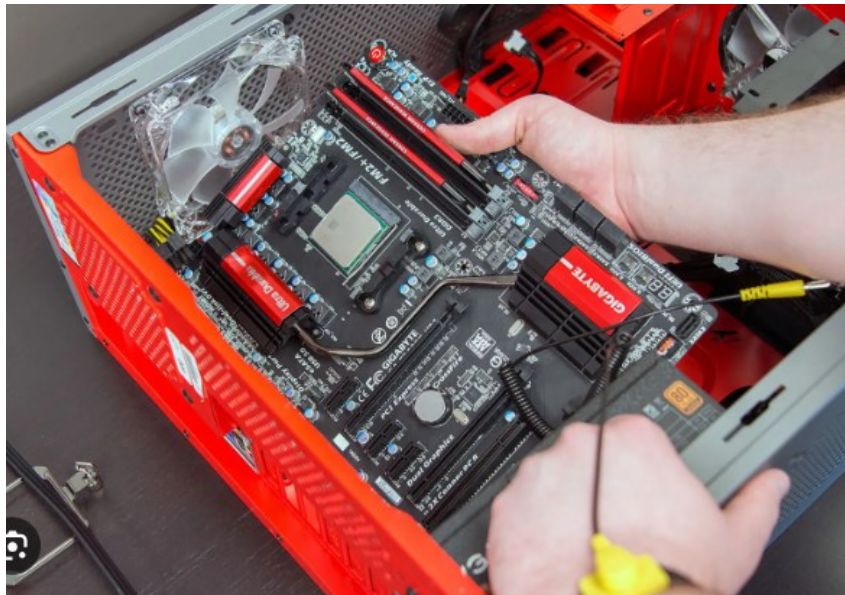
Open the RAM slots on the **motherboard** and insert the RAM modules, aligning the notch on the module with the slot on the motherboard.

Apply firm, even pressure on both **ends** of the RAM module until it clicks into place.



Install Motherboard:

Install standoffs in the PC case corresponding to the mounting holes on the motherboard. Carefully place the motherboard **into** the case, aligning the mounting holes with the standoffs. Secure the motherboard to the case using screws, ensuring it is firmly in place.



Connect Power Supply:

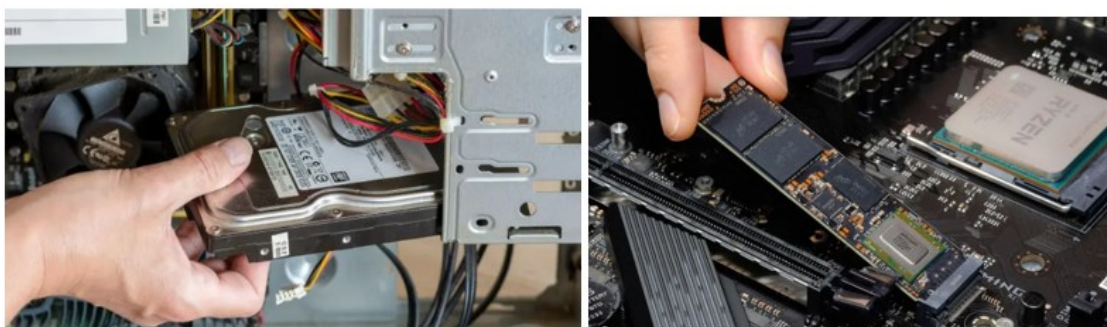
Install the power supply unit (PSU) into the case, aligning it with the mounting holes. Connect the main motherboard power connector (24-pin or 20+4-pin) and CPU power connector (4-pin or 8-pin) to the motherboard. Connect power cables to any other components requiring power, such as drives and graphics cards.



Install Storage Drives:

Mount hard disk drives (HDDs) or solid-state drives (SSDs) into drive bays or mounting brackets in the case.

Connect SATA data cables and power cables to the drives and motherboard.



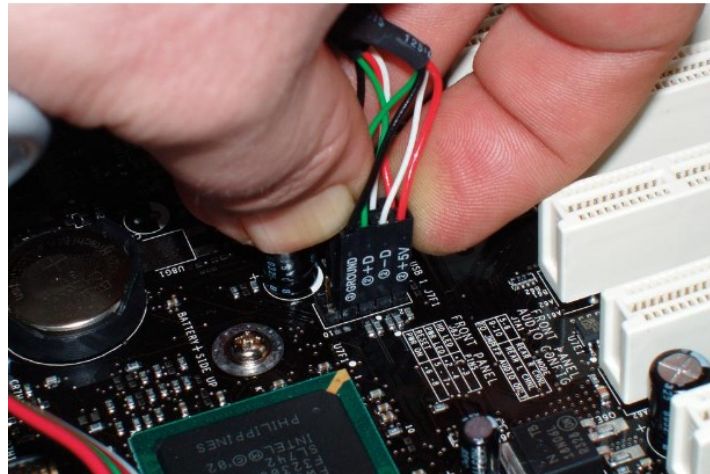
Install Expansion Cards:

Insert expansion cards, such as graphics cards, into the appropriate PCIe slots on the motherboard. Secure the expansion cards in place using screws or retention clips.



Connect Front Panel Cables:

- Connect front panel cables from the case, including power switch, reset switch, power LED, and HDD LED, to the corresponding headers on the motherboard.



Cable Management:

- Organize and route cables **neatly** to improve airflow and aesthetics inside the case.
- Use cable ties or Velcro straps to secure cables and prevent them from obstructing components or airflow.



Close the Case:

- Replace the side panels on the PC case and secure them using screws or latches.

Connect Peripherals:

- Connect peripherals such as monitors, keyboards, mice, and speakers to the appropriate ports on the motherboard or expansion cards.

Power on and Test:

- Plug in the power cord and turn on the computer.
- Verify that the system boots up properly, detects all components, and operates without any errors or abnormalities.

3.1 Performance checking procedure of the PC

Checking the performance of a PC involves evaluating various aspects such as system stability, hardware functionality, and overall speed and responsiveness.

Procedure for conducting performance checks on a PC:

Initial Inspection:

Start by visually inspecting the PC for any physical damage, loose connections, or signs of overheating. Ensure all components are seated correctly and cables are securely connected.

Boot Up and System Check:

Power on the PC and observe the boot-up process. Check for any error messages or unusual behavior during startup.

Enter the BIOS or UEFI firmware settings to verify that the system detects all hardware components correctly, including the CPU, RAM, storage drives, and peripherals.

Operating System Check:

Once the system has booted into the operating system, check for any system notifications, error messages, or software updates.

Open the Task Manager (Ctrl + Shift + Esc on Windows) or Activity Monitor (Command + Space, then type "Activity Monitor" on macOS) to monitor system resource usage, including CPU, RAM, disk, and network activity.

Hardware Stress Testing:

Run hardware stress tests to evaluate the stability and performance of critical components such as the CPU, GPU, and RAM.

Use software tools such as Prime95, FurMark, or MemTest86 for stress testing CPU, GPU, and RAM respectively. Monitor temperatures and performance metrics during stress tests.

Benchmarking:

Run benchmarking software to assess the overall performance of the system compared to similar hardware configurations.

Popular benchmarking tools include 3DMark for GPU performance, Cinebench for CPU performance, and CrystalDiskMark for storage performance.

Application Performance Testing:

Open and run various applications and tasks that are commonly used on the PC, such as web browsing, multimedia playback, gaming, and productivity software.

Observe the responsiveness and smoothness of application performance, as well as any noticeable lag or slowdowns.

Network Performance Testing:

Test network performance by running speed tests using online tools or built-in network diagnostic utilities.

Check for consistent internet speeds and stable network connectivity, especially if the PC is used for online gaming, streaming, or video conferencing.

Temperature Monitoring:

Monitor temperatures of critical components using hardware monitoring software or BIOS/UEFI settings.

Ensure that temperatures remain within safe limits under normal usage and stress testing conditions.

Optimization and Maintenance:

Based on the performance check results, consider optimizing system settings, updating drivers and firmware, or performing maintenance tasks such as cleaning dust buildup or replacing thermal paste.

Self-Check Sheet 3: Assemble Hardware Components

1. Why is it important to assemble hardware components correctly?
2. What are some essential hardware components needed to assemble a computer?
3. What tools are commonly used to assemble hardware components?
4. How should you handle sensitive components like the CPU and RAM during assembly?
5. Why is it important to apply thermal paste correctly when installing a CPU cooler?
6. What precautions should be taken when connecting cables and connectors during assembly?
7. How should you secure hardware components like the motherboard and drives in the case?
8. What is cable management, and why is it important during assembly?
9. What steps should be taken to ensure safety during the assembly process?
10. How can you verify that hardware components are assembled correctly?

Answer Key 3: Assemble Hardware Components

1. Why is it important to assemble hardware components correctly?
Answer: Assembling hardware components correctly ensures the proper functioning and reliability of the system.
2. What are some essential hardware components needed to assemble a computer?
Answer: Essential hardware components include the motherboard, CPU, RAM, storage drives, power supply unit (PSU), and peripherals.
3. What tools are commonly used to assemble hardware components?
Answer: Common tools include screwdrivers, cable ties, anti-static wrist straps, and thermal paste applicators.
4. How should you handle sensitive components like the CPU and RAM during assembly?
Answer: Handle sensitive components delicately by holding them by the edges and avoiding touching the contacts or circuitry.
1. Why is it important to apply thermal paste correctly when installing a CPU cooler?
Answer: Proper application of thermal paste ensures efficient heat transfer between the CPU and cooler, preventing overheating.
2. What precautions should be taken when connecting cables and connectors during assembly?
Answer: Ensure cables are connected securely and routed neatly to prevent interference and maintain good airflow.
3. How should you secure hardware components like the motherboard and drives in the case?
Answer: Use screws or fasteners provided with the case to secure components firmly but not too tight to avoid damage.
4. What is cable management, and why is it important during assembly?
Answer: Cable management involves organizing and routing cables neatly to improve airflow, aesthetics, and accessibility inside the case.
5. What steps should be taken to ensure safety during the assembly process?
Answer: Ground yourself with an anti-static wrist strap, work in a well-lit area, and follow proper handling and installation procedures.
6. How can you verify that hardware components are assembled correctly?
Answer: Verify assembly by double-checking connections, testing the system for functionality, and monitoring temperatures and performance during operation.

Task Sheet 3.1: Assemble Hardware Components

Task Sheet 3.1: Assemble Hardware Components of a PC
Performance Objective: By the end of this task, the trainee should be able to: assemble hardware components to build a personal computer (PC).
1. Explain the function and role of each hardware component in a PC, including the motherboard, CPU, RAM, storage drives, power supply unit (PSU), and case.
2. Demonstrate proper safety procedures, including grounding techniques using anti-static wrist straps and handling components with care to prevent damage.
3. Install the motherboard into the PC case, aligning it with the standoffs and securing it with screws.
4. Demonstrate proper cable management techniques for routing cables behind the motherboard tray.
5. Demonstrate the application of thermal paste (if required) and installation of the CPU cooler, ensuring proper contact with the CPU
6. Install the RAM modules into the motherboard's DIMM slots, applying even pressure until the modules click into place.
7. Demonstrate the installation of storage drives (HDDs/SSDs) into drive bays or mounting brackets in the case, securing them with screws.
8. Perform connecting SATA data and power cables to the drives and motherboard.
9. Perform installation of the power supply unit (PSU) into the case, aligning it with the mounting holes and securing it with screws.
10. Demonstrate the connection of power cables to the motherboard, CPU, drives, and other components.
11. Conduct a visual inspection of all assembled components to ensure they are installed correctly and securely.
12. Power on the PC and verify that the system boots up properly, checking for any error messages or abnormal behavior.

Specification Sheet 3.1

1. Tools and Material required:

1. Screwdriver Set
2. Anti-Static Wrist Strap
3. PC Toolkit
4. Flashlight or Headlamp
5. Cable Management Tools
6. Thermal Paste (Optional)
7. Phillips Screw Holder (Optional)
8. Compressed Air Duster
9. CPU Installation Tool (Optional)
10. Static-Free Work Surface

2. Equipment:

- Computer with all components

Learning Outcome 4: Modify BIOS Setting

Assessment Criteria:

1. Date and time are adjusted
2. Correct processor and memory clock frequency is chosen
3. Storage device and optical drive interface is selected correctly
4. System information is checked and verified from BIOS

Content:

1. Adjusting the date and time
2. Correct processor and memory clock frequency
3. Storage device and optical drive interface
4. System information checking and verifying procedure from BIOS

Resources Required/ Conditions:

The trainees must be provided with the following:

- Handouts or reference materials/books/ CBLMs on the above stated contents
- PCs/printers or laptop/printer with internet access
- Digital projector and Screen
- Bond paper
- Ball pens/pencils and other office supplies and materials
- Relevant learning materials
- Workplace or simulated environment

Methodologies

- Lecture/discussion
- Demonstration/application
- Presentation
- Blended delivery methods

Assessment Methods

- Written test
- Demonstration
- Observation with checklist
- Oral questioning
- Portfolio

Learning Experience 4: Modify BIOS Setting

In order to achieve the objectives stated in this learning guide, you must perform the learning steps below. Beside each step are the resources or special instructions you will use to accomplish the corresponding activity.

Learning Steps	Resources specific instructions
1. Student will ask the instructor about Modify BIOS setting	1. Instructor will provide the learning materials “Performing PC Assembling”
2. Read the Information sheet/s	2. Information Sheet No: 4 Modify BIOS setting
3. Complete the Self Checks & Check answer sheets.	3. Self-Check/s Self-Check No: 4 Modify BIOS setting Answer key No. 4 Modify BIOS setting
4. Read the Job Sheet and Specification Sheet and perform job	4. Job- Sheet No: 4 Modify BIOS setting Specification Sheet: 4 Modify BIOS setting

Information Sheet 4: Modify BIOS Setting

Learning Objectives:

After completion of this information sheet, the learners will be able to:

- 4.1 Adjust date and time
- 4.2 Chose correct processor and memory clock frequency
- 4.3 Select storage device and optical drive interface correctly
- 4.4 Check and verify system information from BIOS

4.1 Adjusting the date and time

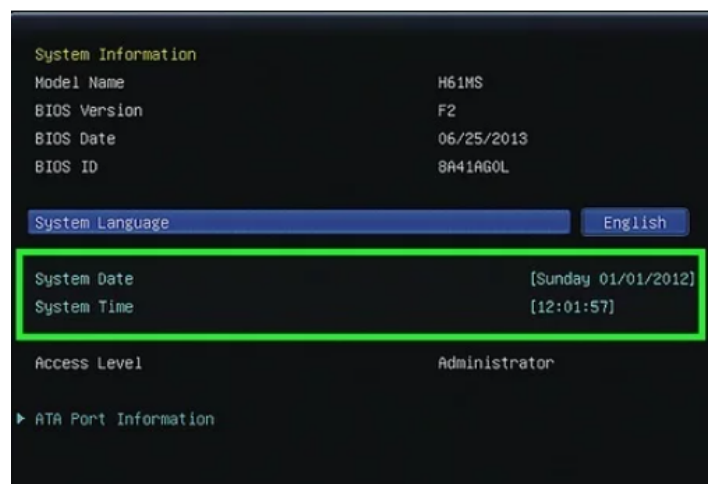
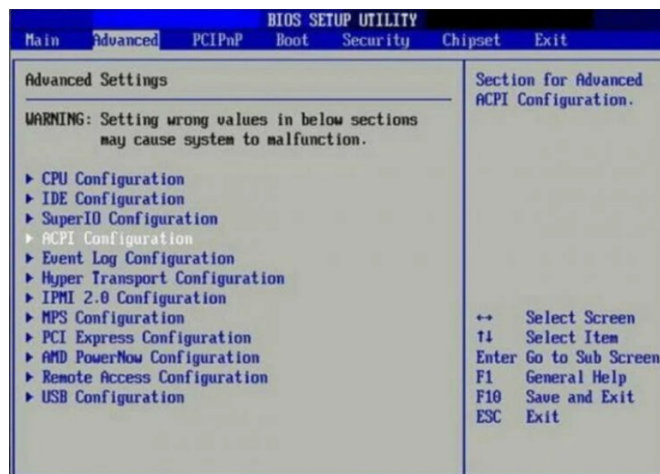
Adjusting the date and time from the computer BIOS (Basic Input/Output System) involves accessing the BIOS setup utility, which is a firmware interface that allows users to configure hardware settings, including the system date and time.

Steps of adjusting the date and time from the computer BIOS:

Accessing the BIOS Setup Utility:

Restart or power on your computer.

During the boot process, typically you'll see a message on the screen indicating which key to press to enter the BIOS setup utility. Common keys include Del, F2, F10, or Esc. Press the specified key repeatedly until the BIOS setup screen appears.



Navigating to the Date and Time Settings:

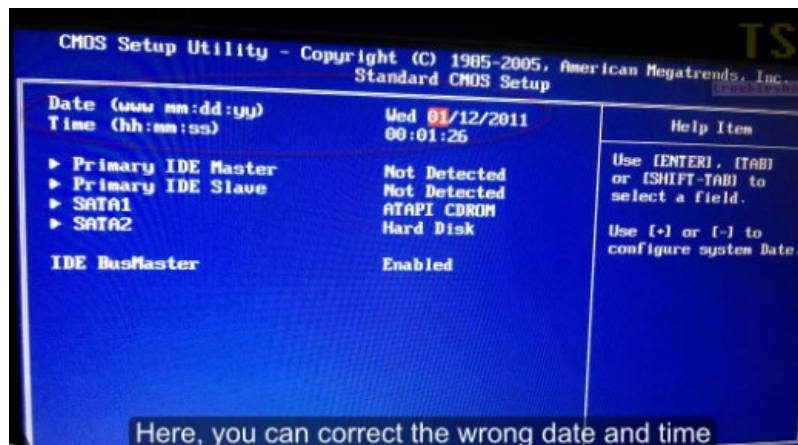
Once in the BIOS setup utility, use the arrow keys on your keyboard to navigate through the menus. The exact location and naming of the date and time settings may vary depending on the BIOS manufacturer and version.

Look for a section or tab labeled "Date and Time," "System Configuration," or similar.

Adjusting the Date:

Within the Date and Time settings, locate the option to set the current date. This option may appear as separate fields for the day, month, and year.

Use the arrow keys to select each field and enter the correct numerical values for the current date.



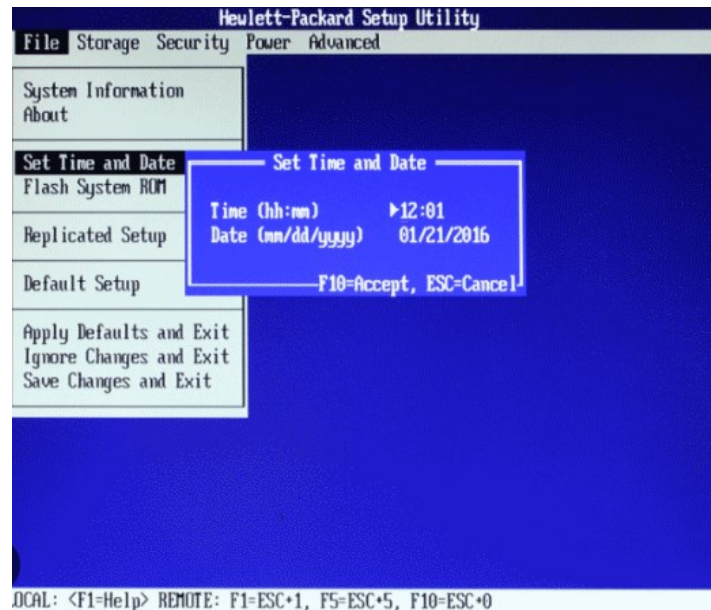
Adjusting the Time:

After setting the date, navigate to the option to set the current time. This option may appear as separate fields for hours, minutes, and seconds.

Use the arrow keys to select each field and enter the correct numerical values for the current time. Pay attention to the AM/PM format if applicable.

Saving Changes and Exiting:

Once you have adjusted the date and time settings, look for an option to save changes and exit the BIOS setup utility. This option is typically labeled as "Save and Exit," "Exit," or similar. Follow the on-screen prompts to confirm that you want to save the changes and exit the BIOS setup utility.



Rebooting the Computer:

After saving the changes and exiting the BIOS setup utility, the computer will restart automatically with the updated date and time settings.

Allow the computer to boot into the operating system, where you can verify that the date and time are displayed correctly.

4.2 Choosing Correct processor and memory clock frequency:

Choosing the correct processor and memory clock frequency involves selecting settings that optimize performance while maintaining stability and compatibility with the system's components.

Processor Clock Frequency:

Considerations:

The processor clock frequency, commonly referred to as the CPU speed or clock speed, determines how quickly the CPU can execute instructions.

Higher clock frequencies generally result in better performance, but they also generate more heat and consume more power.

The optimal clock frequency depends on the specific CPU model, workload, cooling solution, and motherboard support.



How to Choose:

Refer to the specifications of your CPU to determine its base clock frequency and maximum turbo frequency.

Consider the requirements of your computing tasks. For demanding tasks such as gaming or video editing, you may benefit from higher clock frequencies.

Ensure compatibility with your motherboard and CPU cooling solution. Some motherboards may support overclocking, allowing you to increase the CPU clock frequency beyond its default values, but this should be done cautiously to avoid instability or damage.

Monitor temperatures and system stability when adjusting clock frequencies, and revert to default settings if you encounter issues.

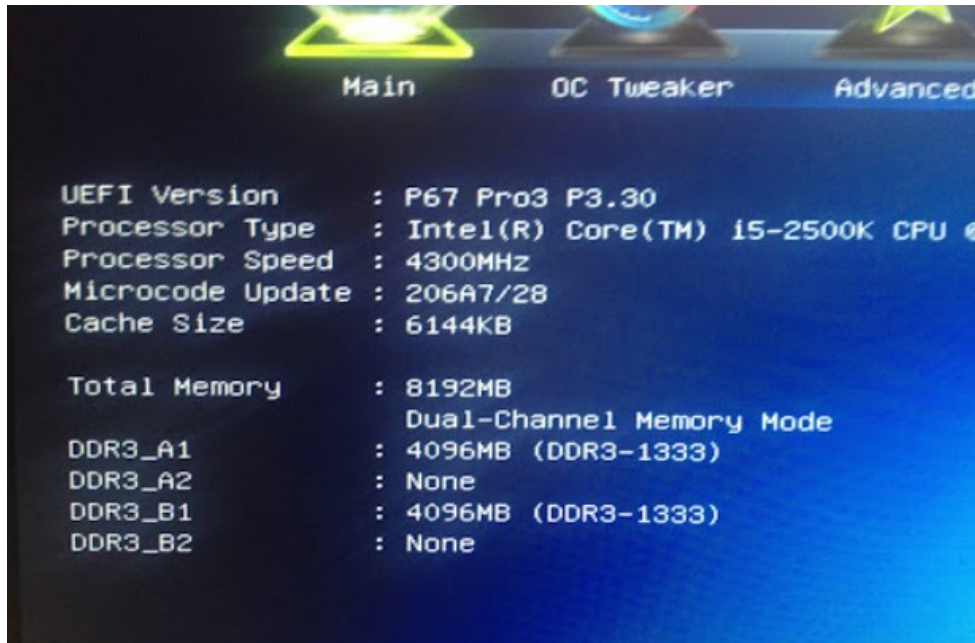
Memory Clock Frequency:

Considerations:

The memory clock frequency, often referred to as RAM speed, determines how quickly data can be accessed from the system memory (RAM).

Like CPU clock frequency, higher memory clock frequencies generally result in better performance, but they may also introduce instability or compatibility issues.

The optimal memory clock frequency depends on the CPU's memory controller, motherboard support, and the memory modules themselves.



How to Choose:

Refer to the specifications of your CPU and motherboard to determine the supported memory clock frequencies.

- Consider the memory modules you have installed. Some RAM modules are rated for higher clock frequencies (e.g., DDR4-3200), while others may have lower ratings.
- Enable XMP (Extreme Memory Profile) or DOCP (Direct Overclock Profile) in the BIOS/UEFI firmware settings to automatically configure memory settings for optimal performance.
- Stress test the system after adjusting memory clock frequencies to ensure stability. Use software tools like MemTest86 to verify memory stability and performance.
- When choosing clock frequencies for both the CPU and memory, aim for a balance between performance, stability, and compatibility.
- Monitor system temperatures, voltages, and stability using hardware monitoring tools to ensure safe operation.
- Incrementally adjust clock frequencies and stress test the system after each adjustment to identify stability issues.
- Keep BIOS/UEFI firmware and drivers updated to ensure compatibility with the latest hardware and optimizations.

4.3 Storage device and optical drive interface selection from the BIOS

Storage device and optical drive interface selection from the BIOS (Basic Input/Output System) involves configuring the BIOS settings to recognize and prioritize storage devices and optical drives connected to the computer. Here's an explanation of how this selection is typically done:

Accessing the BIOS Setup Utility:

Restart or power on your computer.

During the boot process, a message will appear on the screen indicating which key to press to enter the BIOS setup utility. Common keys include Del, F2, F10, or Esc. Press the specified key repeatedly until the BIOS setup screen appears.

Navigating to the Storage Device Settings:

Once in the BIOS setup utility, use the arrow keys on your keyboard to navigate through the menus. The exact location and naming of the storage device settings may vary depending on the BIOS manufacturer and version.

Look for a section or tab labeled "Storage Configuration," "SATA Configuration," "Boot Options," or similar.

Selecting the Storage Device Interface:

Within the storage device settings, you'll typically find options to configure the SATA (Serial ATA) interface settings.

Depending on your system configuration, you may have multiple SATA ports labeled SATA0, SATA1, SATA2, etc. These ports correspond to the physical connectors on the motherboard.

Use the arrow keys to select the desired SATA port/interface for each storage device connected to the system. This selection determines the priority and order in which the devices are detected and initialized during the boot process.

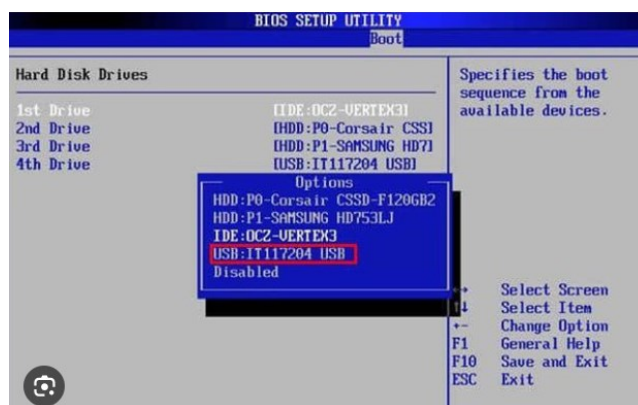
Setting the Boot Priority:

In addition to selecting the storage device interface, you may also need to set the boot priority to specify which device the computer should boot from.

Navigate to the "Boot Options" or "Boot Priority" section in the BIOS setup utility.

Use the arrow keys to select the desired boot device (e.g., hard drive, solid-state drive, optical drive) and adjust its priority relative to other boot devices.

Typically, you'll want to set the primary boot device to the storage device containing the operating system (e.g., Windows or Linux), followed by any secondary storage devices or optical drives.



Saving Changes and Exiting:

Once you have configured the storage device and boot settings, look for an option to save changes and exit the BIOS setup utility. This option is typically labeled as "Save and Exit," "Exit," or similar.

Follow the on-screen prompts to confirm that you want to save the changes and exit the BIOS setup utility.

Rebooting the Computer:

After saving the changes and exiting the BIOS setup utility, the computer will restart automatically with the updated storage device and boot settings.

The system will now prioritize and initialize storage devices and optical drives according to the settings configured in the BIOS.

4.4 System information checking and verifying procedure from BIOS

Checking and verifying system information from the BIOS (Basic Input/Output System) involves accessing the BIOS setup utility to view detailed information about the hardware components installed in the computer. Here's an explanation of the procedure:

Accessing the BIOS Setup Utility:

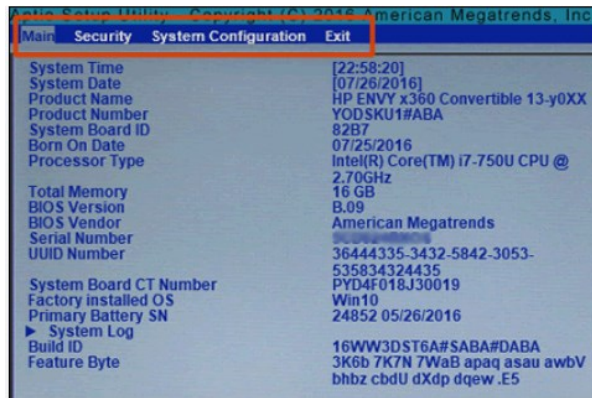
Restart or power on your computer.

During the boot process, a message will appear on the screen indicating which key to press to enter the BIOS setup utility. Common keys include Del, F2, F10, or Esc. Press the specified key repeatedly until the BIOS setup screen appears.

Navigating to System Information:

Once in the BIOS setup utility, use the arrow keys on your keyboard to navigate through the menus. The exact location and naming of the system information settings may vary depending on the BIOS manufacturer and version.

Look for a section or tab labeled "System Information," "Main," "System Configuration," or similar.



Viewing System Information:

Within the system information settings, you'll find detailed information about various hardware components installed in the computer.

Common system information that you can view from the BIOS includes:

CPU information: Model, speed, core count, and temperature.

Memory (RAM) information: Total installed memory, memory slots used, and memory speed.

Storage device information: Hard drives (HDDs/SSDs), optical drives, and connected storage interfaces (SATA, NVMe).

Motherboard information: Model, manufacturer, BIOS version, and chipset.

BIOS settings: Configuration options for boot priority, CPU settings, and hardware monitoring.

Use the arrow keys to navigate through the system information and view details about each hardware component.

Verifying System Information:

Verify that the system information displayed in the BIOS matches the actual hardware configuration of your computer.

Check CPU model and speed, memory capacity and speed, storage device detection, and other relevant information.

Ensure that all hardware components are detected and listed correctly in the system information.

Exiting the BIOS Setup Utility:

Once you have viewed and verified the system information, look for an option to exit the BIOS setup utility and return to the main boot menu.

This option is typically labeled as "Exit," "Save and Exit," or similar.

Follow the on-screen prompts to confirm that you want to exit the BIOS setup utility and save any changes made.

Rebooting the Computer:

After exiting the BIOS setup utility, the computer will restart automatically, and the operating system will boot normally.

Use the system information obtained from the BIOS to troubleshoot hardware issues, verify hardware compatibility, or gather information for system upgrades.

Self-Check Sheet 4: Modify BIOS Setting

1. Why is it important to adjust the date and time settings on a computer?
2. What is the significance of time synchronization on a computer?
3. What is the impact of incorrect date and time settings on system functionality?
4. What is the processor clock frequency?
5. How do you determine the correct memory clock frequency for your system?
6. What are the potential risks of overclocking the processor or memory?
7. What tools can you use to monitor processor and memory clock frequencies?
8. How can you optimize processor and memory clock frequencies for better system performance?
9. What is the purpose of configuring storage device and optical drive interfaces in the BIOS?
10. How do you access storage device and optical drive interface settings in the BIOS?
11. What types of interfaces are commonly used for storage devices?

Answer Key 4: Modify BIOS Setting

1. Why is it important to adjust the date and time settings on a computer?
Answer: Adjusting the date and time ensures accurate timestamps for file creation, modification, and system events.
2. What is the significance of time synchronization on a computer?
Answer: Time synchronization ensures that the computer's clock is synchronized with an accurate time source, such as a network time server.
3. What is the impact of incorrect date and time settings on system functionality?
Answer: Incorrect date and time settings can cause issues with file synchronization, software licensing, and scheduling tasks.
4. What is the processor clock frequency?
Answer: The processor clock frequency, measured in GHz (gigahertz), determines how quickly the CPU executes instructions.
5. How do you determine the correct memory clock frequency for your system?
Answer: Refer to the specifications of your CPU and motherboard to identify the supported memory clock frequencies.
6. What are the potential risks of overclocking the processor or memory?
Answer: Overclocking can lead to increased heat generation, reduced system stability, and voided warranties.
7. What tools can you use to monitor processor and memory clock frequencies?
Answer: Software tools such as CPU-Z and HWMonitor can provide real-time monitoring of processor and memory frequencies.
8. How can you optimize processor and memory clock frequencies for better system performance?
Answer: Adjust clock frequencies within the recommended limits specified by the CPU and motherboard manufacturers, and monitor system stability during overclocking.
9. What is the purpose of configuring storage device and optical drive interfaces in the BIOS?
Answer: Configuring interfaces ensures that the BIOS can detect and communicate with connected storage devices and optical drives.
10. How do you access storage device and optical drive interface settings in the BIOS?
Answer: Access the BIOS setup utility during system boot and navigate to the "Storage Configuration" or similar section.
11. What types of interfaces are commonly used for storage devices?
Answer: SATA (Serial ATA) and NVMe (Non-Volatile Memory Express) are common interfaces for storage devices.

Task Sheet 4.1:

Task Sheet 4.1: Modify BIOS Setting
Title: Modify BIOS Setting
Performance Objective: By the end of this task, the trainee should be able to familiarize participants with essential BIOS settings related to adjusting date and time, configuring processor and memory clock frequencies, setting up storage device and optical drive interfaces, and checking system information.
1. Explore the BIOS setup utility to locate processor and memory clock frequency settings.
2. Identify the supported clock frequencies for the processor and memory.
3. Adjust the clock frequencies within the recommended limits.
4. Enter the BIOS setup utility and navigate to the storage device and optical drive interface settings.
5. Configure the SATA and/or NVMe interfaces for storage devices.
6. Verify the boot priority order for storage devices.
7. Adjust the date and time settings to reflect the current date and time.
8. Access the system information section within the BIOS setup utility.
9. Review the displayed system information, including CPU, memory, storage devices, and motherboard details.
10. Verify that the displayed information matches the actual hardware configuration of the computer.
11. Save the changes and exit the BIOS setup utility.

Learning Outcome 5: Store and Clean Tools and Equipment

Assessment Criteria:

1. Tools and equipment are cleaned and stored as per workplace standard
2. Workplace is cleaned

Content:

1. Clean and store procedure of tools and equipment
2. Workplace cleaning procedure

Resources Required/ Conditions:

The trainees must be provided with the following:

- Handouts or reference materials/books/ CBLMs on the above stated contents
- PCs/printers or laptop/printer with internet access
- Digital projector and Screen
- Bond paper
- Ball pens/pencils and other office supplies and materials
- Relevant learning materials
- Workplace or simulated environment

Methodologies

- Lecture/discussion
- Demonstration/application
- Presentation
- Blended delivery methods

Assessment Methods

- Written test
- Demonstration
- Observation with checklist
- Oral questioning
- Portfolio

Learning Experience 5: Store and Clean Tools and Equipment

In order to achieve the objectives stated in this learning guide, you must perform the learning steps below. Beside each step are the resources or special instructions you will use to accomplish the corresponding activity.

Learning Steps	Resources specific instructions
1. Student will ask the instructor about Store and clean tools and equipment	1. Instructor will provide the learning materials “Performing PC Assembling”
2. Read the Information sheet/s	2. Information Sheet No: 4 Store and clean tools and equipment
3. Complete the Self Checks & Check answer sheets.	3. Self-Check/s Self-Check No: 5 Store and clean tools and equipment Answer key No. 5 Store and clean tools and equipment
4. Read the Job Sheet and Specification Sheet and perform job	4. Job- Sheet No: 5 Store and clean tools and equipment Specification Sheet: 5 Store and clean tools and equipment

Information Sheet 5: Store and Clean Tools and Equipment

Learning Objectives:

After completion of this information sheet, the learners will be able to:

- 5.1 Clean and store Tools and equipment as per workplace standard
- 5.2 Clean workplace

5.1 Cleaning and storing tools and equipment

Cleaning and storing tools and equipment according to workplace standards is essential for maintaining their functionality, prolonging their lifespan, and ensuring a safe working environment.

Cleaning and storing procedure:

Cleaning Procedure:

- a. Inspection:**
Before cleaning, visually inspect each tool and equipment for any damage, wear, or debris accumulation.
- b. Disassembly (if applicable):**
Disassemble tools and equipment into their individual components, if possible, to clean hard-to-reach areas thoroughly.
- c. Cleaning Tools:**
Use appropriate cleaning materials such as mild detergent, soap, or solvent-based cleaners.
Wipe down surfaces of tools and equipment with a clean, damp cloth to remove dirt, grease, or grime.
Use brushes or scrubbing pads to remove stubborn residues from tool surfaces.
For delicate equipment, use compressed air or soft brushes to dislodge dust and debris.
- d. Accessibility:**
Ensure that commonly used tools and equipment are easily accessible, while less frequently used items can be stored in less accessible areas.
- e. Labeling:**
Label storage containers or compartments with the names or images of the tools and equipment they contain to facilitate quick identification and retrieval.
- f. Regular Inspection:**
Periodically inspect stored tools and equipment for signs of damage, rust, or deterioration.
Remove any damaged or worn items from service and replace them as needed.
- g. Compliance:**
Ensure compliance with workplace safety regulations and standards regarding tool storage, including fire safety, hazardous material handling, and accessibility requirements.

5.2 Workplace cleaning procedure

In the context of PC assembling, workplace cleaning procedures are crucial to ensure a clean and organized environment conducive to efficient and safe assembly processes. Here's how workplace cleaning procedures can be applied specifically to PC assembling:

a. Preparing the Workspace:

Clear the workspace of clutter and unnecessary items to create a clean and organized environment for PC assembly.

Ensure adequate lighting and ventilation in the workspace to facilitate visibility and comfort during assembly tasks.

b. Dusting and Surface Cleaning:

Before beginning PC assembly, dust surfaces such as workbenches, desks, and assembly areas using microfiber cloths or dusters.

Wipe down surfaces to remove dust, dirt, and debris that could potentially contaminate PC components during assembly.

c. Personal Hygiene Practices:

Encourage assembly technicians to practice good personal hygiene, including washing hands thoroughly before and after handling PC components.

Provide hand sanitizer or disinfectant wipes for assembly technicians to use as needed during the assembly process.

d. Organizing Assembly Area:

Organize PC components, tools, and equipment in designated areas to streamline the assembly process and minimize the risk of misplacement or damage.

Use trays, bins, or organizers to keep small components organized and easily accessible during assembly.

e. Regular Maintenance and Inspection:

Schedule regular maintenance tasks such as cleaning air filters and dust filters in PC cases to prevent dust buildup and maintain optimal airflow.

Conduct periodic inspections of assembly tools and equipment to ensure they are in good working condition and free from damage or defects.

f. Documenting Cleaning Procedures:

Document cleaning procedures and protocols specific to PC assembly, including cleaning schedules, products used, and any special considerations.

Provide training to assembly technicians on proper cleaning techniques and hygiene practices to maintain a clean and safe assembly environment.

Self-Check Sheet 5: Store and Clean Tools and Equipment

1. Why is it important to clean the workplace before PC assembling?
2. How often should the workplace be cleaned during PC assembling?
3. What steps should be taken to store tools and equipment during PC assembling?
4. Why is it important to inspect tools and equipment before storing them during PC assembling?
5. How should tools and equipment be organized during storage to facilitate easy access during PC assembling?

Answer Key 5: Store and Clean Tools and Equipment

1. Why is it important to clean the workplace before PC assembling?
Answer: Cleaning the workplace removes dust and debris that could contaminate PC components, ensuring a clean assembly environment.
2. How often should the workplace be cleaned during PC assembling?
Answer: The workplace should be cleaned regularly, ideally before each assembly session, to maintain cleanliness and prevent dust buildup.
3. What steps should be taken to store tools and equipment during PC assembling?
Answer: Tools and equipment should be stored in designated areas, organized systematically, and protected from damage or contamination.
4. Why is it important to inspect tools and equipment before storing them during PC assembling?
Answer: Inspecting tools and equipment ensures they are in good working condition and free from damage or defects before storage.
5. How should tools and equipment be organized during storage to facilitate easy access during PC assembling?
Answer: Tools and equipment should be organized systematically, with frequently used items placed in easily accessible locations to streamline the assembly process.

Review of Competency

Below is yourself assessment rating for module “**Performing PC Assembling**”

SL no	Assessment of performance Criteria	Yes	No
1.	PPE is used and safe work practice is followed		
2.	PC equipment is Isolated from electrical source when assembling		
3.	Electrostatic discharge precautions are observed at all times		
4.	Safe work practice observed and personal protective equipment (PPE) worn as required for the work performed		
5.	Tools and equipment are selected as required		
6.	PC are collected for disassemble		
7.	Tools are collected as required		
8.	PC is disassembled		
9.	Components of user PC are identified and documented		
10.	Components of PC are collected		
11.	Tools are collected for assemble as required		
12.	Components of PC are assembled		
13.	Pc is connected with the power source		
14.	Performance of the PC is checked		
15.	Date and time are adjusted		
16.	Correct processor and memory clock frequency is chosen		
17.	Storage device and optical drive interface is selected correctly		
18.	System information is checked and verified from BIOS		
19.	Tools and equipment are cleaned and stored as per workplace standard		
20.	Workplace is cleaned		

I now feel ready to undertake my formal competency assessment.

Signed:

Date:

Development of CBLM

The Competency based Learning Material (CBLM) of ‘**Performing PC Assembling**’ (Occupation: **IT Support Service, Level-3**) for National Skills Certificate is developed by NSDA with the assistance of SIMEC System Ltd., ECF Consultancy & SIMEC Institute of Technology JV (Joint Venture Firm) in the month of June, 2024 under the contract number of package SD-9B dated 15th January 2024.

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