Ethiopian TVET-System

IT SUPPORT SERVICE LEVEL II
Based on May 2011 Occupational Standards

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Module Title: Maintaining Equipment and Consumables
TTLM Code: ICT ITS2TTLM 1019v1

This module includes the following Learning Guides
LG37: Clean Equipment
  LG Code: EISITS2 M10 1019 L01LG37
LG38: Replace and maintain consumables and supplies
  LG Code: EISITS2 M10 1019 L02LG38
LG39: Maintain equipment
  LG Code: EISITS2M10 1019 L03LG39

Instruction Sheet	LG36: Clean Equipment

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Accessing and verifying Cleaning equipment
- Recording and documenting Maintenance actions
- Cleaning equipment

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

1. Access and verify cleaning supplies for usability on the selected **equipment**
2. Record and document maintenance actions undertaken according to organizational procedures
3. Clean equipment as per manufacturer specifications and in line with organizational manuals

Learning Activities
1. Read the specific objectives of this Learning Guide.
2. Read the information written in the "Information Sheets 1" in pages 3-9.
3. Accomplish the "Self-check 1" in pages 10.
4. Read the information written in the "Information Sheets 2" in page 11.
5. Accomplish the "Self-check 2" in pages 12.
6. Read the information written in the "Information Sheets 3" in page 13.
7. Accomplish the "Self-check 2" in pages 14.

8. If you earned a satisfactory evaluation proceed to "Operation Sheet 1". However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity # 1.

9. Perform the "Operation Sheet 1" in pages 15-17.

10. If you earned a satisfactory evaluation proceed to "Lap Test". However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Operation Sheet.

11. Do the "LAP test" on page 18 (if you are ready) and show your output to your teacher. Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory you can proceed to Learning Guide 37.

- Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory you can proceed to the next topic.

Information Sheet 1	Accessing and verifying Cleaning equipment

1.1. Introduction

> **Maintenance**
>
> **Maintenance** - refers to rectifying faults and changing settings or components to ensure that equipment continues to work effectively.

Maintenance can be:

- **Routine** such as when a device or its components is serviced as matter of course. Procedures such as adding paper to the printer tray, cleaning the ink jet cartridges, aligning the print heads or changing toner cartridges are some examples of routine maintenance.

- **Non-routine** such as when a device or its components are serviced to rectify a specific fault. Procedures such as replacing a faulty floppy disk drive or adding extra RAM to a poorly performing computer are some examples of non-routine maintenance.

- **Preventative** such as scheduled repair or component replacement to keep them in optimum working condition. Procedures such as cleaning the keyboard, monitor, mouse, printers and floppy disks are some examples of preventative maintenance.

Based on the definitions above you will appreciate how important it is to maintain the operations of basic hardware (equipment) and replace consumables.

Hardware components may include but are not limited to:

- Personal computers

- Network systems

- Personal organizers

- Communication equipment

One of the consequences of omitting regular maintenance is to invite a build-up of dust and dirt. This leads to problems such as:

- Keyboard keys sticking

- Mouse skipping or erratic behavior

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- Printer, fax and photocopier jamming
- Power supply failure

Routine or preventative maintenance ensures that the computer equipment will remain in good working order thereby reducing unnecessary service calls and loss of productivity.

Maintaining your computer

Keeping your computer in the best condition does more than give you room for more files. Unfortunately just deleting unused files isn't enough to keep your computer happy.

With routine and simple maintenance, your computer will be faster and more reliable. Keeping your computer in prime condition requires routine maintenance. Regular scanning and defragmenting of your computer is good for your hard drive.

If you have a computer, you have dust. Some computers have more dust than others; this depends on the environment. Computers used by smokers tend to gather more dust.

Fig. 1.1 Dusty Computer

The best way to keep your computer free of dust is to use a can of compressed air, open your computer's case, and start spraying. It is advisable to do this outdoors. You may want to pick out any larger "clumps" before you start spraying. Doing this once or twice a year can prolong the life of your computer.

Fig. 1.2 Tool Kit

Make sure you pay special attention to various fans in the computer as these cool it. You do not need to remove or disassemble anything.

Fig. 1.3 Cleaning tools

1.2. Identifying cleaning tools and equipments

To ensure that the cleaning resources required at a critical time are available and in good condition, it is often necessary for the information technology section to manage the ordering and storage of cleaning materials such as:

Pressurized air duster

- Anti-static cleaner

- Cleaning cartridges

- Lint-free cloth

- Non-streaking screen cleaner

Some maintenance activities also require the use of cleaning equipment. These may include, but are not limited to:

- Vacuum

- Voltage meter

- Maintenance kit for laser printer

- Brush

Whatever the nature of the maintenance to be undertaken, you first need to identify the materials required and access them from stores according to the organization's procedures. Accessing cleaning materials may be a simple or complex procedure depending on the nature of the organization. For example, many organizations use stock requisition forms which are completed by the person needing the stock. These forms are then countersigned by the supervisor and passed over to the storekeeper, who will arrange for the items to be taken from the storeroom.

Your responsibility is to find out the procedures that you are expected to follow.

Some of the important and mostly used computer components and peripherals cleaning equipments are briefly elaborated as follows:

- **Liquid Cleaning Compounds**

    Before using any liquid cleaning compound make sure that your computer is turned off. If the PC has power when you use liquid cleaners, you run the risk of damaging or shorting out your components, which is an expensive risk to take. Also make sun that the component you have cleaned with a liquid cleaner is thoroughly dry before turning your computer back on!

Fig. 1.4 Electronic Components Cleaner

- **Clean or Soapy Water and a Damp Cloth**

In some cases, you need only a bit of water and a damp cloth for cleaning chores, such as when cleaning the mouse ball, the outside of the mouse, or the exterior of the monitor or computer case. If water alone cannot do the job thoroughly, you can use mild soapy water on your damp cloth. Make sure that the cloth is damp and not wet and that you do not splash or drip water into your components.

If the keys on your keyboard start to stick or you have spilled a cup of coffee into your keyboard, or, for that matter, you just know that there is a lot of dirt under the keys, you can clean the keyboard with distilled water.

- **Denatured Alcohol**

The best thing to use for cleaning floppy drive heads, motherboard, and other internal components of computers and other equipments such as printers, is denatured alcohol (methylated spirits). But how do you get it in there? You can't just pour it in! You need to use a lint free swab dipped in the alcohol to clean the floppy drive heads, or you can purchase a floppy drive cleaning kit, which almost always comes complete with denatured alcohol. Don't clean the mechanical mechanism with alcohol because the parts are lubricated and the alcohol will dissolve the lubricant.

Fig. 1.5 Methylated spirits

When cleaning your mouse, you can use a damp cloth to clean the cover and ball, as mentioned earlier, but what about the rollers?

You should regularly inspect your contacts and clean them with denatured alcohol. Denatured alcohol is the best solution for cleaning the oily residue caused by human oil secretions, and it evaporates, leaving no residue behind.

- **Glass Cleaner**

You need to turn your monitor off before cleaning to avoid damage to the screen. Many technicians clean the monitor screen with regular glass cleaner. Under most circumstances, however, water and a damp cloth will do the job just fine. Water is the safest cleaning liquid you can use on a monitor. **When cleaning the LCD display screen of a laptop, do not use glass cleaner at all. You will melt the screen!**

Fig. 1.6 Glass Cleaner

- **Fabric Softener**

Some technicians like to use a mixture of 1 part fabric softener to 10 parts water to clean the plastic casing of their computer components. As a cleaning solution it's not as good as mild soap and water, but as an anti-static solution it's excellent! Use it after the cleaning process to help protect your computer from the harmful effects of static electricity.

- **Cleaning Contacts and Connectors**

To protect your contacts and connectors from becoming dirty, avoid touching them with your hands. Your skin contains natural oils that can leave a residue on contacts and connectors, and that residue needs to be cleaned off. Leaving the contacts untouched will reduce the amount of residue and make them easier for you to clean.

- **Erasers**

Some technicians use an eraser to rub residue off contacts, but this leaves a residue of its own and may actually rub the contacts right off. If you absolutely must use erasers, make sure you use the white ones, and immediately clean any rubber residue off of the contacts. Never, ever use pink erasers to clean contacts as these contain acids that have the potential to destroy your contacts.

- **Non-Static Vacuums**

Common household dust kills PCs. Throw in some dog and cat hair and you might as well call a priest right now. A dust buildup can cause dreaded static and can cause your components to overheat and become useless. When removing dust buildup from your keyboard, inside your computer's case, and from your components, use a non-static vacuum (shown in Figure 2.1). Many hand-held vacuums are designed specifically for use on PCs. Note that you should definitely not use a common household vacuum cleaner. These create static electricity and can damage your PC!
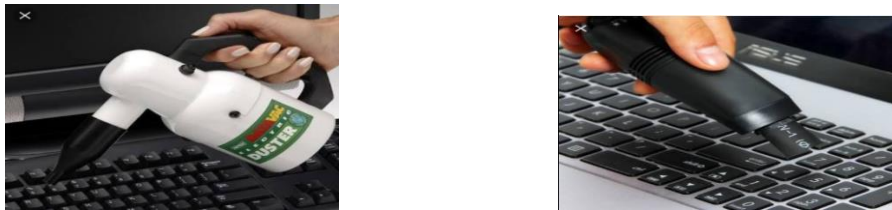

Fig. 1.7 Non-Static Vacuum

- **Lint-Free Cloths**

Lint-free cloths are excellent for removing dust from your computer. The cloths used for cleaning eyeglasses work the best, because they will not scratch surfaces or leave lint behind.

Make sure you never use "dry dusting" lint-free cloths and the like for cleaning anything in or on your computer. Cloths such as the Swiffer Sweeper do wonders for dusting those hard-to-reach places in your house, but they use static electricity to collect the dust. As you probably know by now, static electricity is computer enemy number one!

1.3. Precautions

Precautions are guidelines to be followed to prevent damage to equipment or injury to people. The following are very important precautions:

- Before cleaning any electrical equipment make sure that it is switched off and unplugged from the mains.

- Allow certain equipment, such as monitors and laser printers, to cool down and lose their capacitance (charge) before cleaning them for at least 30minutes.

- When cleaning inside the PC, or handling parts from a PC such as hard disk or circuit boards, you should earth yourself using antistatic wrist strap.

- Always refer to the manufactures manual before attempting to clean any equipment, because improper cleaning or maintenance may be dangerous and also may invalidate your warranty.

- Some equipment such as power supplies and monitors use voltages and therefore should only be maintained by specially trained people. It could be dangerous for any one else to open these up for maintenance.

Cleaning in an IT environment

Why clean?

Dust needs to be removed because it acts as an insulator that prevents air from circulating over or through the components and this can cause overheating. If dust contains conductive particles it can also cause a short circuit, which ca damage components or even cause a fire.

Removing Dust

Dust can be removed using a household vacuum cleaner with an appropriate attachment, although it is much easier to use a purpose-built computer vacuum cleaner or keyboard cleaner.

Residue from hands

The human skin produces residues that cling to surface of the computer hardware we touch, which can be removed with liquid cleaners. However, use only specifically designed cleaners for cleaning computer equipment. Unsuitable cleaners may:

- cause dangerous fumes
- damage the plastics used in computer hardware
- release ozone-damaging gases
- not clean effectively

Self-Check 1	Written Test

Name: _____   Date: _____

Instruction: Answer all the questions listed below, if you have some clarifications- feel free to ask your teacher. Please ask your trainer for the questionnaire for this Self-Check.

Choice: <u>Choose the correct answer</u>

1. Cleaning your computer components and peripherals is used to:

    A. Keep the components and computer in good working condition

    B. keep the computers from spreading germs

    C. Protect your computer's system from viruses

    D. All except C

2. It is not necessary to turn off your computer while using any liquid cleaning compound.

    A. True   B. False

3. Which one of the following is a cleaning tool used to remove dust buildup from your keyboard, inside your computer's case, and from your components?

    A. Non-Static Vacuum   B. Eraser

    B. Lint-Free Cloths   D. Fabric Softener

4. Which one of the following is an important precaution?

    A. Before cleaning any electrical equipment make sure that it is switched off.

    B. Allow certain equipment, such as monitors and laser printers, to cool down and lose their charge before cleaning them for at least 30 minutes.

    C. When cleaning inside the PC, you should earth yourself using antistatic wrist strap.

    D. Always refer to the manufactures manual before attempting to clean any equipment.

    E. All

5. Using unsuitable cleaners may

    A. cause dangerous fumes

    B. damage the plastics used in computer hardware

    C. release ozone-damaging gases

    D. All

Information Sheet 2	Recording and documenting Maintenance actions

2.1. Access inventory systems and document events

Inventory - A record of items in stock (store). This is used to track consumables or to accurately describe devices.

In an IT organization inventory is likely to be computerized. If you have access to those files it will be possible for you to check the stock (store) levels to see if the cleaning materials or consumables that you require are available. Your organization may operate one of the following systems:

- **Perpetual Inventory System**

  This system enables the availability of the balance of stock on hand at any point in time because a continuous record of additions to and reductions from inventory is maintained. The perpetual inventory system can be computer based and is easier, less costly and effective for monitoring stock.

- **Periodic Inventory System**

  Costs of inventory used and balances on hand are computed periodically such as at the end of a month or year. The main objective of the periodic inventory system is to determine the quantity of stock on hand at a particular point in time.

In documenting events, be sure to:

- ✓ Record description/code of item received or issued
- ✓ Record the date and quantity received and issued
- ✓ Record/calculate the balance e.g. opening inventory + receipts – issues = closing inventory
- ✓ Count stock (physical inventory) and compare with inventory records
- ✓ Record adjustments to correct inventory records
- ✓ Prepare reports to summarize inventory balances
- ✓ Submit reports to management as required

NOTE: These are just guidelines. The rule of thumb is to follow organizational procedures.

Self-Check 2	Written Test

Name: _____   Date: _____

Instruction: Answer all the questions listed below, if you have some clarifications- feel free to ask your teacher. Please ask your trainer for the questionnaire for this Self-Check.

Choice: <u>Choose the correct answer</u>

1. A file that enables you to check the stock (store) levels to see if the cleaning materials or consumables that you require are available:

   A. Inventory   B. Any excel file   C. Schedule   D. All

2. In the case of _____ inventory system, costs of inventory used and balances on hand are computed periodically such as at the end of a month or year.

   A. Perpetual   B. Periodic   C. Random   D. None

3. Which one of the following is true about Inventory System?

   A. It is used to check if equipments are available

   B. It is used to determine the quantity of stock on hand at a particular point in time.

   C. Perpetual inventory system can be computer based and is easier, less costly and effective for monitoring stock.

   D. All

4. In documenting events in to an inventory file, you need to be sure that you include:

   A. Description/code of item received or issued

   B. The date and quantity received and issued

   C. Adjustments to correct inventory records

   D. All

Information Sheet 3	Cleaning peripherals as recommended by manual

3.1. Cleaning peripherals as recommended by manual

Cleaning keyboards, discs, screens and other peripherals is a standard housekeeping function; and guidelines or instructions are usually included with the operational and technical manuals for each piece of equipment. The manual also recommends a maintenance schedule and a failure to follow this recommendation runs the risk of system malfunction. This can be detrimental to all concerned.

Peripherals that require cleaning include:

- Printers
- Scanners
- Tape cartridges
- Multimedia kits
- Keyboard
- Speakers
- Mouse
- Touch Pad

Computer equipment is sold with manuals that advise the purchaser about maintenance. Therefore, your first point of reference when cleaning discs/peripherals is the manual. Nevertheless, here are some common recommendations for cleaning discs/peripherals:

- **Keyboard**. Turn it upside down and gently tap the bottom
- **Monitors**. Use a damp cloth
- **Mouse**. Turn upside down, remove the panel, and clean the tracking ball and the rollers inside. If you have a laser make sure that the light is clear, free of dirt or blockage.
- **Printers**. Clear out paper jams, change cartridges and clean. Most printers have a print head cleaning function or you can use a print head cleaning kit.

NOTE: Make sure that you read the manufacturer's instructions before you perform any maintenance and that you follow your organization's procedures. This will safeguard against loss and damage to equipment due to inappropriate use of cleaning fluid or methods.

Self-Check 3	Written Test

Name: _____   Date: _____

Instruction: Answer all the questions listed below, if you have some clarifications- feel free to ask your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

Choice: Choose the correct answer

1. It is not necessary to read the manufacturer's instructions before you perform any maintenance

   A. True   B. False

2. Your first point of reference when cleaning discs/peripherals is the _____.

   A. Manufacturer's Manual   B. Record book   C. Internet   D. None

3. Which of the following peripheral is cleaned by turning it upside down and gently taping the bottom?

   A. Mouse   B. Printer   C. Keyboard   D. Monitor

4. Which of the following peripheral is cleaned by using a damp cloth?

   A. Mouse   B. Printer   C. Keyboard   D. Monitor

Operation Sheet 1	Cleaning Peripherals

1.1. Monitors

Carefully clean dust away from the vents in the monitor's enclosure using a vacuum cleaner. Anything other than a vacuum cleaner (e.g. a rag or air blower) is likely to push the dust inside the enclosure where it can lie on electrical components, causing failure. You should clean the glass screen with one of the cleaners described previously.

If you use a spray to clean a monitor you should be careful to spray the wipe.

Steps to follow:

- **STEP 1:** Ensure that you have the supplies that you need: non streaking window cleaner, soft clot, duster and a dust mask if you're allergic to dust.
- **STEP 2:** Check the manual. If the manufacturer has provided specific instructions, follow them.
- **STEP 3:** Shut down the computer and ensure the power is off at the wall.
- **STEP 4:** Use the duster to dust around the outside of the monitor at the back and the sides.
- **STEP 5:** Spray the window cleaner onto the cloth and wipe over the monitor. This is alright to do with LCD screens too.
- **STEP 6:** make sure the screen is wiped dry afterwards.
- **STEP 7:** turn power back on.

1.2. Printers

You will get the greatest benefit from cleaning a printer if you can remove any dust from the paths of moving parts. To do this you may need to remove covers or paper trays.

However, at all times refer to the printer manual. It will contain the instructions for removing parts and may even have some tips on cleaning. Do not use any liquid cleaner on a printer unless the manufacturer recommends it.

Laser Printers

To clean laser printers:

- Switch off and unplug the printer, and wait at least 30 minutes for it to cool.
- Wear disposable plastics gloves.
- Clean the outer casing of the printer using a dampened paper towel or a lint-free cloth with a little detergent on it.
- Check for, and remove any loose bits of paper.
- Vacuum inside the printer using a static-safe vacuum cleaner.
- Use a lint-free swab dipped in isopropyl alcohol to clean the corona wire.

1.3. <u>Keyboards</u>

The keyboard tends to not only accumulate a lot of dust and skin residue but also some hair and lint form clothing. Loose matter can generally be removed with the vacuum cleaner.

Follow the following steps to clean a keyboard:

- **STEP 1:** Ensure that you have the supplies that you need: compressed air (in an aerosol can); a soft rag, any nonabrasive household cleaning fluid suitable for cleaning plastic; and a dust mask if you're allergic to dust.
- **STEP 2:** Check the manual. If the manufacturer has provided specific instructions, follow them. Generally speaking cleaning keyboards is reasonably straight forwards so this should not be an issue.
- **STEP 3:** Shut down the computer.
- **STEP 4:** Disconnect the keyboard.
- **STEP 5:** Use compressed air to clean between the keys. Spray at an angle to dislodge dust and grime.
- **STEP 6:** Shake loose dust gently out of the keyboard.
- **STEP 7:** If using aerosol cleaning fluid, follow the manufacturer's instructions. Otherwise, spray a small amount of fluid onto a rag.
  OPTIONAL: If they keyboard is not working right the keys can be gently prized off and excessive amounts of dust or dried sticky liquid has probably dried and formed a residue which is preventing the keyboard from working properly. Clean the keyboard with a damp cloth and detergent and let it dry before reconnecting. (may take up to 72 hours)
- **STEP 8:** Wipe the keys and chassis. The keys can be cleaned with a damp cloth and detergent. A small brush can be used to dust between the keys.

- **STEP 9:** Wait until the keyboard is dry before reconnecting it to the computer.
- **STEP 10:** Reconnect the keyboard and restart the computer.

1.4. <u>Mouse</u>

The mouse tends to accumulate a mixture of dust and skin residue from the surface it rolls on. Therefore to properly clean the mouse you should follow the following steps:

- **STEP 1:** Shut down the computer.
- **STEP 2:** Check the manual. If the manufacturer has provided specific instructions, follow them.
- **STEP 3:** Disconnect the mouse.
- **STEP 4:** Turn the mouse upside down and remove ball-cover ring by turning it in the direction shown which is generally counterclockwise. If it does not have a cover you can generally remove a screw and open the mouse up.
- **STEP 6:** Remove the ball.
- **STEP 7:** Rinse the ball with warm water.
- **STEP 8:** Use a cotton bud covered with isopropyl alcohol to remove dust.
- **STEP 9:** Carefully scrape the three rollers with a small hard object such as a small jewelers screw driver, tweezers or even a paper clip to remove gunk. Some say to use a toothpick but the trouble is they break and can leave debris which may interfere with the operation of the mouse.
- **STEP 10:** Clean rollers with a swab dipped in alcohol.
- **STEP 11**: Reassemble mouse when all the parts are dry.
- **STEP 12:** Reconnect the mouse to your computer.

1.5. <u>Scanners and photocopiers</u>

The glass top flatbed scanners, like those of monitors and photocopiers, can get pretty dirty with finger marks. Usually you would use a lint-free cloth dabbed with whatever chemical the manufacture recommends to wipe it clean.

1.6. <u>Power Supplies</u>

Maintenance for the power supply to PCs includes:

- ✓ Vacuuming dust from the vent holes
- ✓ Checking that the cables coming out of them are not damaged or broken
- ✓ Checking that the power socket is clear of dust and dirt

1.7. <u>CD/DVD Drive</u>

To clean a CD or DVD you will require a lint free cloth and solution. You will need to gently wipe from the centre out.

- CD/DVD drives are cleaned using a special disk soaked with a solvent.
- The disk is placed into the drive.
- The drive will try to access the cleaning disk and will eventually give an error message.
- You will need to do this 3 times.
- Allow the drive to stand a while for any solvent to dry before using it.

Lap Test	Practical Demonstration

Name: _____   Date: _____

Time started: _____   Time finished: _____

Instructions: You are required to perform the following individually with the presence of your teacher. Please ask your trainer for the instructions for this lap test.

Activity 1: Documentation

1. Use *Microsoft Word* to create the table which will contain the following:
   - ✓ Record description/code of item received or issued **(Item Code)**
   - ✓ Record the date and quantity received and issued **(Date)**
   - ✓ Inventory balances **(In Stock/Store)**
   - ✓ Cleaned by
2. Save the document as *Maintenance Documentation Template*
3. Print the document (a blank table)
4. This document will be used to keep a record of each task you complete in the remaining activities. Complete the table by hand as you complete each task.
5. Once the table is full, type your hand written information into the document
6. Print the completed document and save as *Maintenance Documentation for Your Name*

Activity 2: Clean your Computer

1. Complete *Operation Sheet 1* step by step to clean your computer, monitor, mouse and keyboard.

2. Update your personal *Maintenance Documentation* as you go (see Activity 1 above)

3. Get your work marked (ask for the teacher) immediately after you have finished to demonstrate your competence in this task.

➢ *Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your trainer shall advice you on additional work. But if satisfactory, you can proceed to the next topic.*

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Instruction Sheet	LG38: Replace and maintain consumables and supplies

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

1. Access stock from store and record information according to organizational procedures
2. Access relevant manual according to organizational guidelines and procedures.
3. Replace consumables promptly with minimum effect on other users
4. Test hardware to ensure it is in working order according to established procedures

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

5. Accessing **consumables** from storage points and record usage information in line with organizational procedures
6. Replacing consumables when needed and log the action undertaken
7. Disposing of consumables following environmental guidelines
- Testing equipment to ensure it is in working order at set time periods and in line with organizational procedures

Learning Activities

12. Read the specific objectives of this Learning Guide.

13. Read the information written in the "Information Sheets 1" in pages 3-4.

14. Accomplish the "Self-check 1" in pages 5.

15. Read the information written in the "Information Sheets 2" in pages 6-7.

16. Accomplish the "Self-check 2" in pages 8.

17. Read the information written in the "Information Sheets 3" in pages 9-11.

18. Accomplish the "Self-check 2" in pages 12.

19. Read the information written in the "Information Sheets 3" in page 13.

20. Accomplish the "Self-check 2" in pages 14.

21. If you earned a satisfactory evaluation proceed to "Lap Test". However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Operation Sheet.

22. Do the "LAP test" on page 15 (if you are ready) and show your output to your teacher. Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory you can proceed to Learning Guide 38.

- Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory you can proceed to the next topic.

Information Sheet 1	Accessing consumables and recording usage information

1.1. Overview

Consumables can be defined as any parts or supplies that need replacing periodically in order for the machine to perform all of its functions.

What are Information Technology (IT) Consumables?

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IT consumables are items that you use relating to your computer set-up. Examples of IT consumables can include:

- Inkjet cartridges
- Laser printer toner cartridges
- Ribbon cartridges
- Tape cartridges
- Floppy disks
- ZIP disks
- CD ROMs blanks
- Tape, CD, floppy labels
- Cables, connectors, plugs
- Cleaning tools and materials
- Batteries
- Power boards, extension leads, spike protectors
- Fuses

1.2. Ordering Consumables

In a work place someone will have the responsibility for ordering consumable items. Each business or workplace will have their own procedures set in which employees need to familiarize themselves with. Many items can be ordered online while other companies may still require a paper order form. Most workplaces will expect the following to occur:

- A projected cost of consumables over a financial year is made
- When consumables are required a number of quotes will be expected. Normally at least 3 with the cheapest quote being used
- An order will be placed. The order may have to go through a separate section for approval. Once the order is approved then it will be entered online or faxed.

- Once the goods arrive they will be checked against the invoice to ensure all goods that the invoice lists are there. The invoice must then be checked against the actual order. If there is a discrepancy then the company needs to be contacted and a request is made for the remainder of the goods.

- A copy of the invoice will be stored for auditing purposes.

It is necessary to design a form that could be used to order consumables. It must use a company logo and be very professional in appearance.

Sample order form

Item No. (S.No)	Item Name	Model Number	Description	Manufacture date	Order Date	Ordering Body	Status
0001	Dell Laptop	01225WS4	1 tera, 6 Gb, Win10	2019	05/10/2019	ICT	Received
0002	Dell Laptop	01225WS5	1 tera, 6 Gb, Win10	2019	20/10/2019	ICT	Not received
0003	Dell Laptop	01225WS6	1 tera, 6 Gb, Win10	2019	20/10/2019	ICT	Not received

Self-Check 1	Written Test

Name: _____ Date: _____

Instruction*:* Answer all the questions listed below, if you have some clarifications - feel free to ask your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

Choice: Choose the correct answer

1. _____ can be defined as any parts or supplies that need replacing periodically in order for the machine to perform all of its functions.

   A. Peripherals   B. Consumables   C. Input Devices   D. Output Devices

2. IT consumables are items that you use relating to your computer set-up. Which one of the following cannot be categorized as IT Consumable?

   A. Motherboard   B. Printer Cartridge   C. Batteries   D. Cleaning tools and materials

3. All of the following are expectations in which workplaces expect to occur in consumables order except:

   A. A projected cost of consumables over a financial year is made

B. When consumables are required a number of quotes will be expected.

C. A copy of the invoice will be stored for auditing purposes.

D. None

Information Sheet 2	Replacing consumables and logging the action undertaken

2.1. REPLACE CONSUMABLES

Consumables must be replaced promptly and with minimum effect on other users. For this to happen, adequate stocks must be in the stores and the user should be trained to replace them as required. Failure to replace consumables promptly can lead to loss of productivity and to frustration on the part of the user.

Consumables that require frequent replacement

The following table lists consumables and equipments that are most frequently replaced in various situations. Note that, the equipments and consumables are not limited to the listed items in the table.

Consumable	Frequency	Remark
Printer Cartridges	Most frequently	• Whenever the ink becomes empty from the cartridge. • You should use a cartridge which for specifically for the specific printer.
Copy Machines Cartridges	Most frequently	• Whenever the ink becomes empty from the cartridge. • You should use a cartridge which for specifically for the specific printer.
Fax Machine Cartridges	Most frequently	• Whenever the ink becomes empty from the cartridge. • You should use a cartridge which for specifically for the specific printer.
RAM	Less Frequently	• Whenever it is failed and is impossible to repair it.
Hard Disk	Less Frequently	• Whenever it is failed and is impossible to repair it.
Power Supplies	Less Frequently	• Whenever it is failed and is impossible to repair it.
Key Board	Less Frequently	• Whenever it is failed and is impossible to repair it.
Mouse	Less Frequently	• Whenever it is failed and is impossible to repair it.

2.2. Recording or Logging actions under taken

It is very important to log/record replacement activities whenever it takes place. For this to happen the technician should prepare a form which helps to keep records about the replacement activities which will be helpful for future.

Sample Form

Date	Item	Component Replaced	Reason	Replaced by
13-08-2019	HP Laser Jet 2035	Cartridge	No ink	Ayele
22-08-2019	Dell Vostro 2015 Desktop PC	Mouse	Broken	Sisay
19-09-2019	Dell Vostro 2015 Desktop PC	RAM	Pins Damaged, and Failed to operate	Sisay
27-09-2019	Dell Vostro 2015 Desktop PC	Power Supply	Burnt due to high electric voltage	Ayele

Self-Check 2	Written Test

Name: _____   Date: _____

Instruction*:* Answer all the questions listed below, if you have some clarifications - feel free to ask your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

Matching: Identify the following consumables replacement frequency.

A	**B**
1. Printer Cartridges: _____	A. Most frequently

2. Copy Machines Cartridges:

_____

3. Fax Machine Cartridges:

_____

4. RAM: _____

5. Hard Disk: _____

6. Power Supplies: _____

7. Key Board: _____

8. Mouse: _____

B. Less Frequently

Information Sheet 3	Disposing consumables by following environmental guidelines

2.1. Disposing consumable equipment

Disposal of Computer Waste

"Disposal" refers to the reselling, reassignment, recycling, donating, or throwing out of IT equipment through responsible, ethical, and environmentally sound means. It is illegal in several states to simply throw computer parts, or old computers, in the trash.

The average color CRT monitor has about 4 pounds of lead in it. The rest of the computer is a buffet of heavymetals that can cause liver damage, kidney failure, cancer, and a host of different diseases that affect not only human beings but wildlife as well.

It is the duty of us technicians resopnseblity to properly recycle or dispose of our old computer parts.

How do you dispose of used printer consumables?

- Dispose used consumables with recycling centers or the take back programs of printer manufacturers.
- Don't dispose them, manufacture/reuse empty cartridges, drums and other consumables.
- Refill toner cartridges for a number of print cycles and/or recycle OPC drums. I only get rid of these once these have worn out.
- Used consumables often end up with neighborhood trash bins.

Disposal Procedures and Environmental Guidelines

Many computer components, such as batteries, CRTs, chemical solvents, and toner kits (for printers), contain harmful ingredients. Don't throw these items in the garbage! Many of these items can be recycled, and a hazardous waste program can remove most.

Make sure you know the proper disposal procedures for each of the following items.

Batteries

Batteries for the computer often contain lithium, mercury, or nickel-cadmium, which means that if they were to be thrown in the garbage and carried off to a landfill site, they could contaminate the water and soil. You can take batteries to a recycling depot or, in some cases, send them back to the manufacturer.

CRTs

Many CRTs contain lead. If you dump them in the trash (and ultimately in a landfill), you may contaminate the soil and water in your area and poison people. Don't do it! For this reason, CRTs must be recycled or turned over to a hazardous waste program.

Toner Kits and Cartridges

The main concern about the disposal of toner kits and cartridges is that there are to many of them. Most people go through several a year, and if they were all thrown in the garbage, they would fill a landfill site. There are many ways of dealing with toner kits and cartridges.

You can now refill these cartridges, which saves on environmental wear but wreaks havoc on your printer. The printing quality from refilled cartridges is often less than that of new cartridges and the refilled ink can cause the bubble jets on ink-jet printers to clog. Many manufacturers of these cartridges will buy back the used cartridges, refill them, and then resell them, which is probably the best solution.

Chemical Solvents and Cans

Chemical solvents or cans for PC use (or for any other use, for that matter) contain many harmful chemicals that should not be placed in the ground. For this reason, you simply

cannot throw these in the garbage or they may damage the soil and water supply. Instead, chemical solvents and cans must be picked up through a hazardous waste program.

Material Safety Data Sheet

Most compounds, chemicals, and components come with a Material Safety Data Sheet (MSDS) that contains information about the product as well as any warnings, safe disposal requirements, and safe methods of transportation. If an item comes without an MSDS, you can obtain one from the manufacturer or locate one on the Internet.

2.2. System Maintenance

- System maintenance is required to ensure the reliable operation of any mechanical system in a workplace.
- If a computer system is not maintained properly it is more likely to fail.
- System failures prevent workplaces from operating and cost money.
- An adequate system maintenance schedule will help to prevent many of the problems from occurring.
- Routine maintenance is preventative and designed to avoid unnecessary problems.
- Remedial, non-routine, maintenance will try to fix things that are already broken.

2.3. Maintenance Schedules (Logs)

- A maintenance log is used to document components which need maintenance, frequency, times, methods etc...

- A schedule plans for when the maintenance will take place where a log will describes what has been done.

- On the schedule there should be allowance to note when the last maintenance was carried out.

Sample Maintenance Schedule (Log)

Component	Installation Date	Method	Duration	Frequency	Last Maintained	Due Next	Maintained by
Monitor	Oct - 05	Cleaning Cloth and Glass Cleaner	5 min	Weekly	Aug – 06	Aug – 13	Ayele
Keyboard	Oct – 05						
Mouse	Oct – 05						
Printer	Oct – 05						
System Unit	Oct – 05						
Disk Drive	May – 02						
CD-Drive	Jun - 07						

- A maintenance schedule/log is a table which can be manual, Word, Excel.

- The advantage of electronic format is that it is easily updateable and clients can also look to see when the next maintenance is due.

Self-Check 3	Written Test

Name: _____ Date: _____

Instruction: Answer all the questions listed below, if you have some clarifications- feel free to ask your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

1. _____ refers to the reselling, reassignment, recycling, donating, or throwing out of IT equipment through responsible, ethical, and environmentally sound means.

   A. Disposal   B. Maintenance   C. Troubleshooting   D. Both B and C

2. Which of the following is NOT correct about disposing used printer consumables?

   A. Dispose used consumables with recycling centers or the take back programs of printer manufacturers.

   B. Don't dispose them, manufacture/reuse empty cartridges, drums and other consumables.

C. Refill toner cartridges for a number of print cycles and/or recycle OPC drums. I only get rid of these once these have worn out.

D. None

3. Which consumable can be reused by refilling, which saves on environmental wear but wreaks havoc on your printer?

A. CRT   B. Battery   C. Cartridge   D. Chemical Solvents and Cans

4. _____ is used to document components which need maintenance, frequency, times, methods etc.

A. Maintenance Schedule   B. System Maintenance   C. Inventory

     D. All

5. A consumable which contains lead in which if you dump them in the trash, you may contaminate the soil and water in your area and poison people:

A. Battery   B. CRT   C. Cartridge   D. CD/DVD

Information Sheet 4	Testing equipment

4.1. Test hardware to ensure it is in working order according to established procedures

When replacing hardware, test it to verify it is working properly and then apply further tests periodically to ensure continued effective functioning.

You should be mindful of the following:

- Where new equipment is not tested for critical functions before being used, it can lead to failure and hence damage to both data and other linked systems. Therefore, you must ensure that all new installations are thoroughly tested after initial set up and prior to live use. All such tests should be in accordance with a documented test plan.

  NOTE: Inadequate testing can threaten the integrity and availability of your data.

- Check the test outputs to confirm the results. Ensure that all key components, e.g. hard disk subsystems are included in the tests.

- Devices that are known to degrade with time, e.g. printers, should be tested periodically.

- When testing, ensure that the test plan simulates realistic work patterns. When testing is not done in a manner that does not simulate live conditions, the results of such tests cannot be relied on.

- Poor security procedures during equipment testing can compromise the confidentiality of your data. Therefore, Non Disclosure Agreements should be obtained from all third party staff involved in testing the equipment.

- Verify that the required security configuration and safeguards have been implemented for the new hardware.

If live data is used in the testing process for the new hardware, ensure that it is closely controlled.

CAUTION: Damage to equipment must be reported as soon as it is discovered. Repair any damaged equipment that affects your Information Security without delay

as you could possibly lose valuable items and information through any weak links.

Self-Check 4	Written Test

Name: _____ 　　　　　Date: _____

Instruction: Answer all the questions listed below, if you have some clarifications - feel free to ask your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

True/False: Write true or false.

_____ 1. When replacing hardware, it is necessary to test it to verify it is working properly and then apply further tests periodically to ensure continued effective functioning.

_____ 2. Inadequate testing can threaten the integrity and availability of users' data.

_____ 3. Devices that are known to degrade with time, e.g. printers, should NOT be tested periodically.

_____ 4. Poor security procedures during equipment testing can compromise the confidentiality of your data.

_____ 5. When testing is not done in a manner that does not simulate live conditions, the results of such tests cannot be relied on.

Operation Sheet 1	**Replacing Consumables and Equipments**

1.1. <u>Replacing a Power Supply</u>

Power supply is one of the toughest components to replace simply because of the large number of connections. The PC power supply or PSU you are going to replace will take about 15 minutes, including taking all of the pictures.

➔ The first step to replacing a power supply or any other component in a PC is to unplug the power cable from the back of the power supply.

 ✓ The socket for the power cord is above the screwdriver in the picture.

➔ The next step is to remove the cover from the case, which varies like crazy from brand to brand.

- On a standard mid-tower case like this one, you only need to remove a side cover, the one on the opposite side of the power supply fan grille than the cord socket and switch.

- The cover is already removed in this pictures (two screws and it slides right out).

- Finally, we get to remove the screws that hold the ATX power supply in place.

➔ After removing the four mounting screws from the old PC power supply, remove it out of the way on top of the drive cage.

- By leaving the old power supply connected, installing the new power supply, and then replacing the leads one at a time, it's nearly impossible to mess up.

- The only thing you have to watch out for is that the old power supply doesn't fall into the case while you're working and damage the motherboard or CPU.

- Note that this Antec replacement power supply has an intake fan on the bottom, which puts it right next to the CPU heat sink in the standard ATX design.

➔ As soon as the Antec power supply is in place, install the four screws to secure it.

➔ Then you'll stand up the case and the power supply will drop out of place and bash the fan on the heat-sink, or worse.

➔ In any case the four screws securing the PC power supply are just to the outside of the cut-out in the back of the case that the fan, switch and power cord socket protrude through.

➔ Screws that are further out in the painted areas are case screws.

➔ Now we can begin actually replacing the old power supply connectors with connectors from the new power supply.

- The most important power connection(s) in any PC are the motherboard connections.

- The simplest version, as with this Athlon 1000 system, is the standard ATX connector, a single 20 pin (10x2) connector.

➔ To remove it, push in at the top of the latch with your thumb and pull upwards on the connector, shouldn't take any real force.

➔ Then Connect all the connectors on their exact position.

Lap Test	**Practical Demonstration**

Name: _____

_____

Time started: _____

_____

Date:

Time finished:

Instructions: You are required to perform the following individually with the presence of your teacher.

Please ask your trainer for the instructions for this lap test.

Activity 1: Maintenance Scheduling and Maintenance Logs

7. Use *Microsoft Word* to create the table that appears on page 11

8. Save the document as *Maintenance Schedule Template*

9. Print the document (a blank table)

10. This document will be used to keep a record of each task you complete in the remaining activities. Complete the table by hand as you complete each task.

11. Once the table is full, type your hand written information into the document

12. Print the completed document and save as *Maintenance Schedule for Your Name*

Activity 2: Clean your Computer

4. Complete *Activity in the operation Sheet 1.1* step by step to replace a power supply.

5. Update your personal *Maintenance Schedule* as you go (see Activity 1 above).

6. Get your work marked (ask for the teacher) immediately after you have finished to demonstrate your competence in this task

➢ *Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your trainer shall advice you on additional work. But if satisfactory, you can proceed to the next topic.*

Instruction Sheet	LG39: Maintain equipment

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Clean equipment
- Replace and maintain consumables and supplies
- Maintain equipment

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

8. Identify equipment which requires maintenance
9. Maintain equipment as required by organizational guidelines and manufacturer specifications.
10. Document maintenance procedures as required by organizational guidelines.
11. Exercise care to prevent interruption of business activities during maintenance procedures
- Store unused equipment devices in line with manufacturer specifications and organizational guidelines

Learning Activities

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the "Information Sheets 1" in page 3.
3. Accomplish the "Self-check 1" in page 4.
4. Read the information written in the "Information Sheets 2" in pages 5-6.
5. Accomplish the "Self-check 2" in page 7.
6. Read the information written in the "Information Sheets 3" in page 8.
7. Accomplish the "Self-check 3" in pages 9.
8. Read the information written in the "Information Sheets 4" in pages 10-11.
9. Accomplish the "Self-check 4" in pages 12.
10. Read the information written in the "Information Sheets 5" in pages 13-15.
11. Accomplish the "Self-check 5" in pages 16.

- Your teacher will evaluate your output either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work. But if satisfactory you can proceed to the next topic.

Information Sheet 1	Identifying Equipment which requires maintenance

1.1. Identifying Equipments

A properly run organization will have a maintenance schedule for all of its equipment. This schedule would have key information that would allow you to readily identify those pieces of equipment that

require servicing at a particular time. You will find that not all equipment will be serviced at the same time primarily because some are newer than others. Your best choice then, is to refer to the maintenance schedule.

Sample Schedule Form

Computer Maintenance Schedule

Things to Check and Maintain	Daily	Weekly	Monthly	Annually

Note:

With proper maintenance you can avoid trouble and keep your computer running at peak efficiency. The basic steps are:

1. Keep your operating system up-to-date with all the latest security releases.

2. Run an anti-virus program regularly to keep your computer bug free.

3. Run system utilities regularly to make sure your hardware is operating correctly.

Signature: _____

Self-Check 1	Written Test

Name: _____   Date: _____

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Instruction*:* Answer all the questions listed below, if you have some clarifications- feel free to your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

Identification: list and Identify Equipments requiring maintenance.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Information Sheet 2	Equipment Maintenance

2.1. Maintenance Definition

Maintenance is a set of organized activities that are carried out in order to keep an item in its best operational condition with minimum cost acquired.

2.2. Types of Maintenance

- Preventive Maintenance (PM)
- Corrective Maintenance (CM)
- Improvement Maintenance (IM)
- Predictive Maintenance (PDM)
- Run to Failure Maintenance (RTF)

✓ **Preventive Maintenance (PM)**

The advantage of applying preventive maintenance activities is to satisfy most of maintenance objectives. It is good for those machines and facilities which their failure would cause serious production losses.

Its aim is to maintain machines and facilities in such a condition that breakdowns and emergency repairs are minimized.

Its activities include replacements, adjustments, major overhauls, inspections and lubrications.

✓ **Corrective Maintenance (CM)**

In this type, actions such as repair, replacement, or restore will be carried out after the occurrence of a failure in order to eliminate the source of this failure or reduce the frequency of its occurrence.

✓ **Improvement Maintenance (IM)**

It aims at reducing or eliminating entirely the need for maintenance.

✓ **Predictive Maintenance (PDM)**

Predictive maintenance is a set of activities that detect changes in the physical condition of equipment (signs of failure) in order to carry out the appropriate maintenance work for maximizing the service life of equipment without increasing the risk of failure.

✓ **Run to Failure Maintenance (RTF)**

This type of maintenance is useful in the following situations:

- The failure of a component in a system is unpredictable.
- The cost of performing run to failure maintenance activities is lower than performing other activities of other types of maintenance.
- The equipment failure priority is too low in order to include the activities of preventing it within the planned maintenance budget.

2.3. Maintenance procedure and techniques

- Maintenance work order:
    1. Identify the Nature problem
    2. Identify cause of problem
    3. Action code
- Maintenance safety rules:

Maintenance safety rules are safe guard of people and Pc components. It prevents people from injury, equipment from damage.

   A. Laboratory procedures
      ✓ The work place or laboratory should have safety guidelines.
   B. Safe working conditions
      ✓ The work place should be cleaned and organized
      ✓ Think before some action

- General Safety Rules:

The following general safety rules have been developed to provide a safe and healthy working environment for all employees and students. These apply to all work activities.

   ✓ Report to work well rested and physically fit to be able to give full attention to your job.
   ✓ Persons with physical or mental impairment shall not be assigned to tasks where their impairment has a potential to endanger themselves or others.
   ✓ No person shall be permitted to remain on the premises while their ability to work is so affected by alcohol, drugs (prescription or non-prescription) or other substance, so as to endanger their health or safety or that of any other person.
   ✓ Persons working alone shall be required to check-in regularly with security or a supervisor to ensure that their well being is maintained.
   ✓ Inappropriate behavior, such as horseplay, fighting and practical jokes are extremely dangerous and will not be tolerated.
   ✓ Any unsafe conditions which are encountered shall be corrected or reported to your Supervisor and/or the Occupational Health and Safety Department.
   ✓ Do not operate any machinery or equipment if it is known to be in an unsafe condition.
   ✓ Machinery and equipment are only to be operated by qualified persons and then only when adequately trained in the use of the equipment and authorized to operate it.

Self-Check 2	Written Test

Name: _____   Date: _____

Instruction*:* Answer all the questions listed below, if you have some clarifications- feel free to your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

Choice: Choose the correct answer

1. The aim of _____ is to maintain machines and facilities in such a condition that breakdowns and emergency repairs are minimized.
   A. Preventive Maintenance   C. Improvement Maintenance
   B. Corrective Maintenance   D. Predictive Maintenance

2. In _____ type of maintenance, actions such as repair, replacement, or restore will be carried out after the occurrence of a failure in order to eliminate the source of this failure or reduce the frequency of its occurrence.
   A. Preventive Maintenance   C. Improvement Maintenance
   B. Corrective Maintenance   D. Predictive Maintenance

3. Which type of maintenance includes a set of activities that detect changes in the physical condition of equipment (signs of failure)?
   A. Preventive Maintenance   C. Improvement Maintenance
   B. Corrective Maintenance   D. Predictive Maintenance

4. In which of the following situation Run to Failure Maintenance (RTF) is useful?
   A. The failure of a component in a system is unpredictable.
   B. The cost of performing run to failure maintenance activities is lower than performing other activities of other types of maintenance.
   C. The equipment failure priority is too low in order to include the activities of preventing it within the planned maintenance budget.
   D. All

5. Choose the correct maintenance work order.
   A. Identify the Nature problem → Identify cause of problem → Action code

B. Identify the Nature problem → Action code → Identify cause of problem

C. Identify cause of problem → Identify the Nature problem → Action code

D. Identify cause of problem → Action code → Identify the Nature problem

Information Sheet 3	Documenting and reporting Maintenance procedures

3.1. Equipment documentation

Each item of IT equipment should be accompanied by documentation. This may be provided in hard copy, as a manual, on CD, or on a support website. If original documentation provided as hard copy is missing, it can usually also be downloaded from the manufacturer's website. IT Support staff need to be able to read and interpret all such technical documentation.

Documentation for a system should outline the manufacturer's recommended maintenance procedures for the unit. The procedures should state:

- **How often** maintenance procedures should be done
- Any **equipment/material/consumables** that are required
- The actual **steps** to complete the maintenance task, including all relevant safety precautions for the task.

The system's documentation should also identify any components of a system that should *not* have any preventative maintenance applied to it for safety reasons. Generally speaking, hardware manufacturers will include instructions for:

- Cleaning
- Care
- Consumables — handling, installing and disposing
- Making adjustments
- Troubleshooting

Apart from documentation, the supplier's website will supply software patches and driver updates as they become available.

3.2. Reporting Maintenance procedures

Since your external suppliers and internal clients involve different service level agreements, procedures for handling them are usually different, but one may depend on the other. Some of these procedures detail:

- The way service requests are reported
- How fast you can respond to requests — how fast you respond to an internal client will depend on the agreed response time with an external supplier. For example, let's say a workstation

monitor needs replacing. If your external supplier says it will be done within two days, then you can't do it any faster for your client!

- How requests are escalated — an external supplier will have specific, agreed escalation procedures, and these may be different from your own internal ones.

Self-Check 3	Written Test

Name: _____   Date: _____

Instruction*:* Answer all the questions listed below, if you have some clarifications- feel free to your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

True/False: Write True or false.

_____ 1. It is necessary to include any equipment/material or consumables that are required for the maintenance process in the documentation.

_____ 2. Apart from documentation, the supplier's website will supply software patches and driver updates as they become available.

_____ 3. How fast you respond to an internal client will NOT depend on the agreed response time with an external supplier.

Information Sheet 4	Exercising care to prevent interruption of business activities

4.1. Minimizing downtime

It is important that preventative maintenance focuses on items that may cause significant downtime and cost to the business if they were to fail. Such items may include hard disk drives (HDD) of servers. Should they fail, emergency downtime may occur at a significant cost to the business. As a result, such devices should be considered high priority in a maintenance schedule.

Preventative maintenance must be practical within the working of a business. If the process of preventative maintenance causes a major interruption to the daily working of a business, the maintenance program will fail. Always try to consider the impact on the users of the computers when considering a preventative maintenance program.

4.2. Meet business needs

Any maintenance program must meet the needs of the business if it is going to be successful. While this should have been considered when an SLA was written, the maintenance work must be carried out within the organisation's guidelines and requirements.

When should tasks be scheduled?

Scheduled maintenance should obviously impact as little as possible on normal business operations, and should therefore be carried out at periods of low activity, such as during the night, at weekends or holiday periods. It is possible to carry out many tasks with very little client awareness or involvement.

If client involvement is required, they should be informed in advance of when they will be affected, for how long and how it will impact them. You may need to give them instructions, such as logging out of their PC, leaving it on, rebooting, and so on.

There are some useful operating systems or third-party tools which allow maintenance tasks to be automatically scheduled. This is the case with later versions of Windows.

How often should tasks be scheduled?

To determine how frequently maintenance tasks should be done, you should first refer to the types of documentation mentioned earlier in this topic. The preventative maintenance strategies in place would also help determine the frequency of tasks. You should also bear in mind the principles listed above. However, if your organisation is small and you are in the process of developing your own schedule, you'll need carry out research and then make these decisions yourself.

For example, how often should a hard disk be defragmented? You'll find opinion divided on this one, as it depends on a number of different factors such as hard disk size, how much space is on the disk, and how much disk and file activity there is. Suggestions range from daily, to three monthly! If it can be scheduled to run automatically during a period of non-activity, a more frequent schedule can do no harm.

Similar decisions need to be made with respect to the scheduling of backups.

What should be recorded?

Scheduling can be a formal process, where preventative maintenance is carefully scheduled for various business units within the organisation and formally documented and signed off. It can also be an informal process.

The following should be documented in a preventative maintenance schedule:

- Dates for maintenance to occur
- Business unit/floor/building/computer facilities where the maintenance will occur
- The it staff member responsible for completing the maintenance
- Dates for completion
- Notification that maintenance has been completed
- Comments or notes where problems are detected.

Reporting problems

Your preventative maintenance schedule will occasionally alert you to potential problems. When this happens, you should be aware of the appropriate person to inform. Your organisational guidelines and/or service level agreements should indicate who this is. It may be your supervisor, authorised business representative, external supplier, or client.

Self-Check 4	Written Test

Name: _____ Date: _____

Instruction*:* Answer all the questions listed below, if you have some clarifications- feel free to your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

True/False: Write True or False.

_____ 1. If the process of preventative maintenance causes a major interruption to the daily working of a business, the maintenance program will fail.

_____ 2. Your preventative maintenance schedule will occasionally alert you to potential problems.

Short Answer: Write a short answer for the following Questions.

1. Write the points that should be documented in a preventative maintenance schedule.

   ✓ _____
   ✓ _____
   ✓ _____
   ✓ _____
   ✓ _____
   ✓ _____

Information Sheet 5	Storing unused equipment devices

1.1. Storage basics

Equipment not being used should be stored. It may be new hardware and software in boxes, or loose parts, or sensitive materials that need to be stored securely until installed or needed. Valuable items such as memory chips or original software copies may need to be locked in a safe.

An IT store can hold new hardware, spare parts, repaired equipment, extra copies of software, daily and weekly backup copies of files as well as memory chips. It can also hold redundant devices such as printers, modems, cables and tools. While the IT department may also keep contracts, licences and other documents, some companies prefer to keep such documentation in their Legal department (if there is one).

IT equipment is often delicate and expensive. The environment for IT hardware and software storage should be:

- Lockable
- Dust-free
- Static-resistant
- Safe from water and humidity
- Well ventilated and lit
- At a constant temperature
- Separated from other perishable stores

Guidance from technical manuals

Most IT equipment is fragile and should be handled with care — it can be damaged if not packed correctly in storage. The technical manual that companies equipment will often advise on packing and storage.

It is also advisable to access the website of the manufacturer. Often they update information about equipment on their website, or add additional information on packing and disposing of computer consumables and equipment.

Information from technical manuals needs to be recorded in the inventory for all stock (in storage or being used) such as the expected lifetime of the product. Printer manuals, for instance, will state how many pages can be printed before the toner cartridge or developer needs replacing. Packed and unopened toner cartridges can be kept for quite some time, but developer has a more limited shelf life.

1.2. Storing components, software originals and documentation

All information about storing components can also usually be found in technical manuals. Generally, sensitive components will be stored as follows.

- **Memory chips**

  Each memory chip should be placed in a foam-protected, anti-static bag. Each bag is then placed in an individual box or in a larger box that will have separate slots for each chip. Memory was once very expensive and always stored in a safe — however, as the cost of memory has fallen, memory is often stored alongside other components.

- **Expansion cards, motherboards and other spares**

  Expansion cards also must be placed in anti-static bags and each bag then placed in an individual box or in a larger box that will have separate slots for each card. This box is then stored in the storeroom, with care taken, if the box is cardboard, not to place other equipment on top of it. Motherboards and other spares should be kept in boxing so that they are not stacked on one another and also to avoid dust building up.

- **CD-ROM drives and hard disks**

  CD-ROM drives are stored in stacks on a shelf in the storeroom. An obvious caution to take is that the stack is not too high, as it may topple over. Hard disks should be placed in foam-protected anti-static bags. Each hard disk needs to be stored in an individual box. The boxes can be placed on top of each other in stacks (again, not too high).

- **Software originals**

  When an organisation purchases software, copies need to be made of all disks. Installation of the software should be carried out with the copied disks and *not* the original. This ensures the security of the original disks, and if there are any problems with the copied disks another copy can be made. The original disks need to be stored in a secure place such as a safe and preferably off-site — as a form of assurance against any problems within the building, such as flooding from heavy rain or fire damage.

- **Documentation**

  Documentation, including manuals that come with hardware and software, needs to be stored correctly. Some manuals may need to be kept with the relevant computers if they are used regularly. Generally, manuals are kept in a storeroom or IT library (which may be in the same place). They

are only used at times of installation and later on for troubleshooting. They should be indexed in the inventory and labelled clearly on shelves or in cabinets.

Documentation such as licensing should be recorded and stored in a safe area, such as a locked filing cabinet. As mentioned, in some larger companies, it may be kept the legal department or in a safe.

1.3. Skills for handling IT equipment

- **Occupational health and safety**

By law, organisations must have an OH&S committee or an OH&S representative in the workplace. Most large organisations employ a staff member who is fully responsible for OH&S and also convenes a committee. Smaller organisations may have a member of staff who is trained in OH&S and is responsible for it as part of their job. Employers must make OH&S guidelines and procedures available in the workplace. Generally, all employees contribute to the maintenance of OH&S by following those procedures and reporting situations where accidents and injuries occur.

Occupational health and safety guidelines must always be practiced when handling computers, peripherals and components.

- **Fragile components**

Fragile components such as memory and expansion cards need to be held on the outer edges. These components are made up of chips, transistors and wires that hold memory and transport information. You should not grasp them in the middle of the component. Your body can hold a large amount of static electricity and this can damage the circuitry, making the component unworkable.

- **Heavy equipment**

Heavy equipment, such as system units and monitors, should be placed correctly onto a trolley with wheels, so they can be moved with ease. If you need to bend down to pick up a heavy object, you should never bend over at the waist or shoulders. You should always keep a straight back and bend at the knees so that objects are lifted with the legs and not the spine, and serious back problems are avoided. Heavy objects must also be carried in the correct position to avoid dropping them.

Name: _____   Date: _____

Instruction*: Answer all the questions listed below, if you have some clarifications- feel free to your teacher.

Please ask your trainer for the questionnaire for this Self-Check.

Choice: Choose the correct answer.

1. Only new equipments need to be stored; the old once should be thrown in a trash.

   A. True   B. False

2. Which one of the followings is NOT correct about the environment for IT hardware and software storage?

   A. Should be Lockable   C. Should be Dust-free

   B. Should be Static-resistant   D. None

3. An IT equipment called _____ should be placed in a foam-protected, anti-static bag.

   A. Memory Cheap   B. CD/DVD   C. Original Software   D. Documentation

4. _____ such as memory and expansion cards need to be held on the outer edges.

   A. Memory Cheap   B. CD/DVD   C. Original Software   D. All