



Ethiopian TVET-System



ELECTRONIC COMMUNICATION AND MULTIMEDIA EQUIPMENT SERVICING Level II

Based on May 2011 Occupational Standards

October, 2019



Module Title: Dismantling and Disposing Communication and Multimedia Equipment

TTLM Code: EEL ICMS2TTLM 1019 v1

This module includes the following Learning Guides

LG37: Ensure decision for dismantling and disposal

LG Code: EEL ICS2 M10 LO1 LG-37

LG38: Plan to dismantle and dispose equipment

LG Code: EEL ICS2 M10 LO2-LG38

LG39: Organize resources needed

LG Code: EEL ICS2 M10 LO3-LG39

LG40: Ensure decision for dismantling and disposal

LG Code: EEL ICS2 M10 LO4-LG40

LG41: Dispose the equipment

LG Code: EEL ICS2 M10 LO1-LG41

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

- Identifying equipment for ***no more service***
- Obtaining approval for dismantling from concerned body
- Informing end users about the equipment to be dismantled

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:**

- ❖ Identify equipment for ***no more service***
- ❖ Obtain approval for dismantling from concerned body
- ❖ Inform end users about the equipment to be dismantled

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below
3. Read the information written in the information “Sheets”
4. Accomplish the “Self-checks” If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet”.
5. Do the “LAP test” (if you are ready).

Information Sheet-1	Identifying equipment for <i>no more service</i>
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Concepts of dismantle and disposal

❖ **Dismantle**

Dismantling: is the process of disassemble/isolate different electrical equipment parts. The term dismantling or disassemble technology is used to retrieve various components from the electronic scrap like computers. Simple components such as plastic, iron and metal parts, usually to isolate hazardous or valuable materials. The removal and containment of residual liquids from tanks and pipes, as well as their storage prior to disposal also requires careful consideration. Residual liquids should be contained and transported in the same containers used for transportation of the liquid product

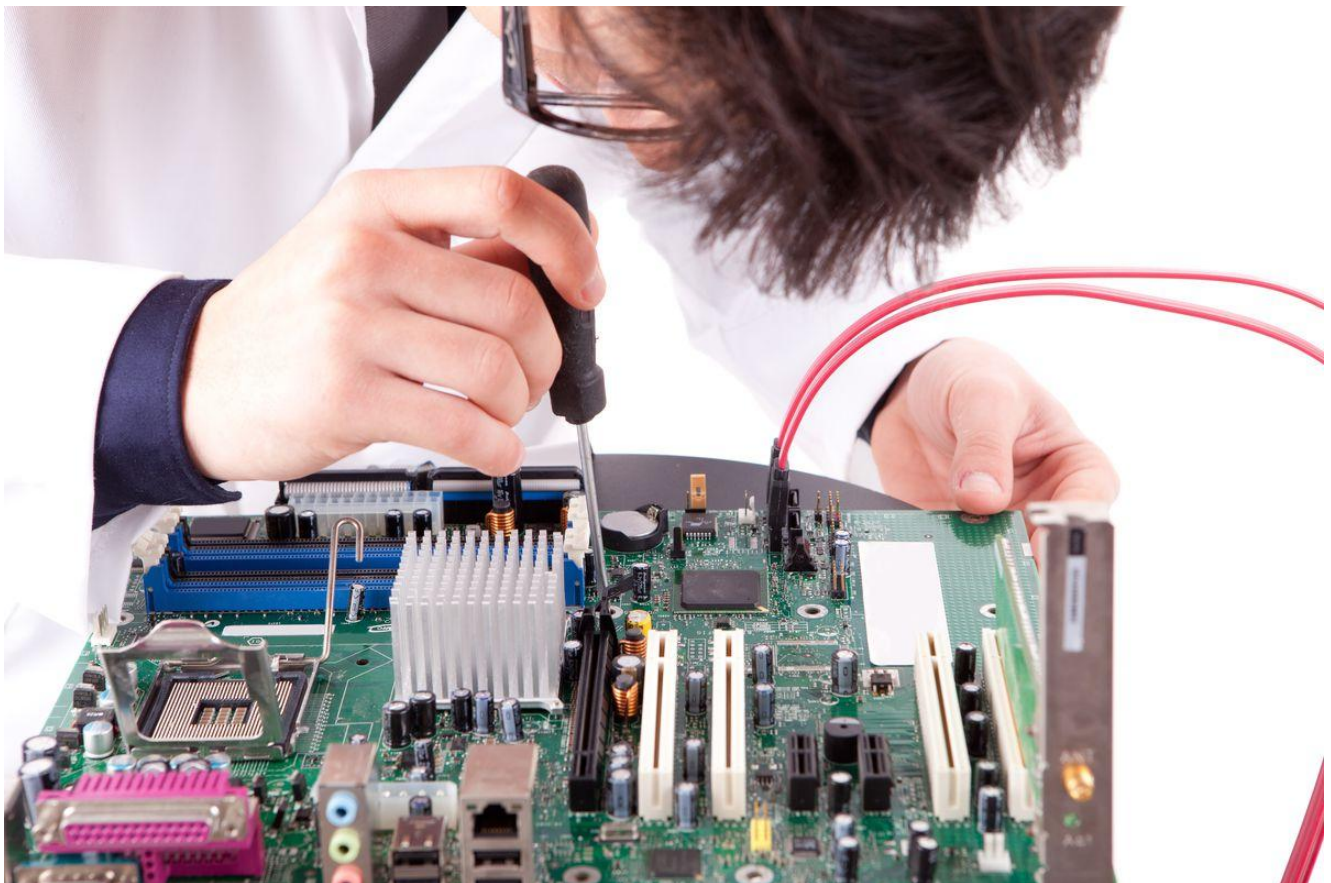


Fig1.1 dismantling electronics

❖ **Disposal of Electrical Equipment**

Disposal: is the action or the process of disposing, the waste material change to reuse, recycle, or totally dispose. If electrical equipment is sold or given away an up to date risk

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assessment must be provided informing the new owner of the equipment of the residual risks or the faults when using the equipment, a signed copy of the risk assessment must be kept for a period of not less than five years. If an item is disposed of by any other means then the electrical item must be decommissioned and rendered inoperative.

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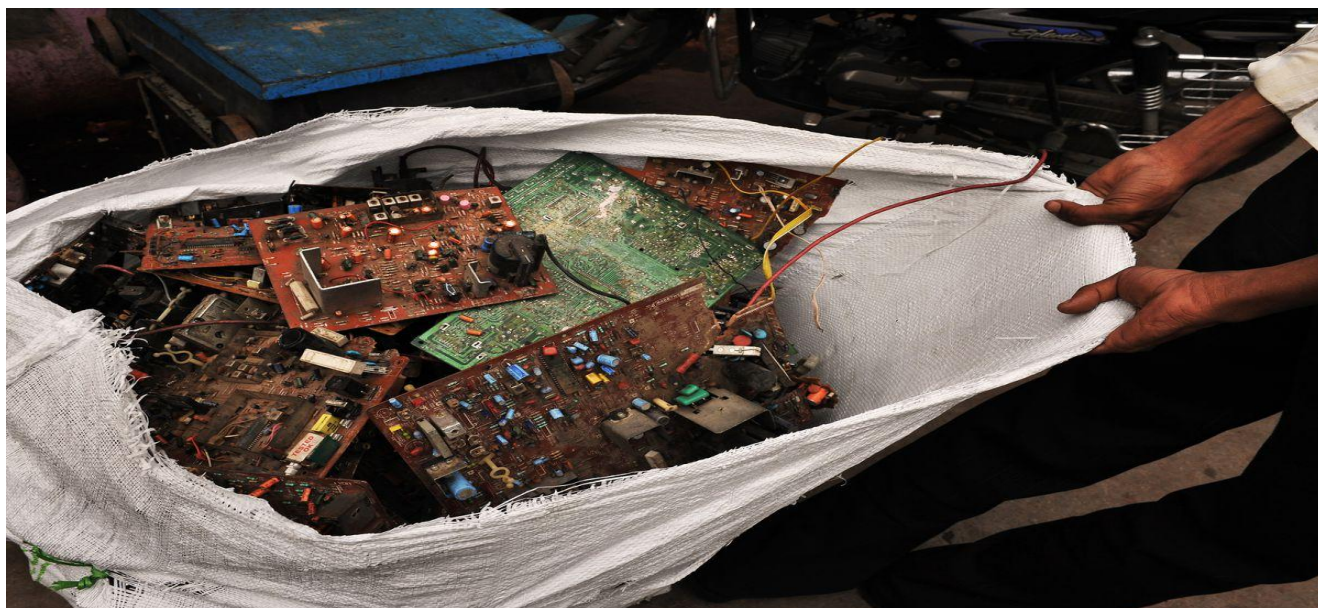


Fig1.2 Disposed Electrical Equipment

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Information Sheet-1	Identify equipment for <i>no more service</i>
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1.1 Identify equipment for ***no more service***

Once electronic devices reach the end of their useful life, they become electronic waste (E-waste) or waste from electrical and electronic equipment (WEEE). WEEE has been defined as any equipment that is dependent on electric currents or electromagnetic fields in order to work properly, including equipment for the generation, transfer and measurement of current. Besides, there is no standard or generally accepted definition of E-waste in the world. E-waste has become the fastest growing component response disposed to the increasing volumes of WEEE and their potential environmental impacts through various disposal routes. E-waste contains a complex array of hazardous substances that can threaten human and the environment if not handled or disposed properly. PCs constitute the second largest component next to CRTs in the E-waste stream and growing most rapidly. PCs also contain the largest amount of printed wiring board (PWB) among electric products. PWBs have been known to contain many types of heavy metals which are toxic to human being and the environment. Also phosphor coatings of cathode ray tubes (CRTs), high lead Content in the CRT Funnel glass, batteries, PWB Capacitors and mercury-containing parts, contained in computer may seriously pollute the environment if they are not properly disposed of.

No more service/ Outdated Electrics Equipments

Technology changes so fast that before long, you are wondering what to do with a growing inventory of obsolete electronics. Corporations will often ignore this problem and just store the equipment so it's out of the way. The problem with this method is that no matter where the obsolete electronics components are being stored, on-site or off, it's costing your company money.

What are out of date Electronics?

Obsolete electronics are components that are no longer supported by the manufacturer who made them. These components are often called "end-of-life," meaning they reached the end of their technically-supported lifespan. In many cases, the equipment may still function properly, but because the manufacturer has ceased supporting that model or product line, the value of the obsolete electronics is usually poor enough to make it unreasonable for resale on the secondary market

One thing that's constant in the continuously-evolving world of technology is change. Almost without exception, such change inevitably applies to tech products that once seemed crucial to maintaining our current standards of living. Like the dial-up modems, VCRs, and floppy disks before them

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Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. VCR is not outdated electronics equipment.
a) True b) false
2. The process of disassemble/isolate different electrical equipment parts
a) Desoldering b) soldering c) **dismantling**
3. Once electronic devices reach the end of their useful life, they become electronic waste
a) true b) false

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask your teacher for the copy of the correct answers

Answer Sheet

Scored Points

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Information Sheet-2	Obtain approval for dismantling from concerned body
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1.2 Obtain approval for dismantling from concerned body

Verification of submitted compliance report will be carried out by the concerned officer. Based on the verification report the inspecting officer himself or the concerned officer as per DOP will issue the safety certificate or he may reissue defect notice along with the re-inspection fee

If you have segregated equipment for repair or refurbishment and intend that repair or refurbishment to occur abroad, you must be able to show us evidence of an established system that ensures that almost all the equipment sent abroad will be re-used, repaired or refurbished. We will consider the nature of the equipment, the method of storage before and during transit and the frequency of shipments in addition to any evidence you supply in deciding whether we accept the shipment is for re-use.

If you are a retailer and have an established system for returned goods to separate returned equipment for re-use (including re-use after repair) from that which is to be sent for treatment and recycling; only that sent for treatment and recycling will be regarded as waste. Items that have been competently assessed and segregated for re-use (even with repair) will not be regarded as waste. An established system means the retailer must have an auditable system that ensures that almost all of the items segregated for reuse will in fact be re-used.

If only the special item is actually re-used or there is not an auditable system in place that demonstrates that the items segregated for reuse have been reused, the equipment is likely to be waste from the time it is collected

Following documents shall be submitted to the concerned authority organization for obtaining the dismantling approval

- 1) Requisition Letter

- 2) Approved copy of the installation

- 3) Prescribed fee.

In case of relocation, after getting dismantling approval, consumer has to apply for commissioning approval as per procedure

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Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

- 1 Which of the following document is used to obtaining the dismantling approval?
 - a) Requisition Letter
 - b) Approved copy of the installation
 - c) Prescribed fee.
 - d) **All of the above**
1. Approval is very essential to dismantle and dispose waste material.
 - a. False
 - b. true**

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

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Information Sheet-3	Inform end users about the equipment to be dismantled
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1.3 Inform end users about the equipment to be dismantled

Traditional dismantlers without proper facilities cannot suitably recover the hazardous substances, the valuable parts of waste home appliances such as compressors in air conditioners and refrigerators are separated and sold to second hand shops; whereas, improper treatment will leave problems of secondary pollution behind

Human exposure to lead from electronic products is more problematic because of illegal recycling in cottage industries in different countries that have little or no regulatory misunderstanding. Without a well developed recycling and fix up program in different countries, we can expect that health risks associated with outmoded electronic products will continue to be shifted from one part of the world to another.

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Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Inform end users about the equipment to be dismantled is very useful

a) **True** b) false

2. Traditional dismantlers without proper facilities can suitably recover from the hazardous substances

b) True **b) false**

Answer Sheet

Note: Satisfactory rating - 3 and 5 points

Unsatisfactory - below 3 and 5 points

You can ask you teacher for the copy of the correct answers.

Score = _____

Answer sheet

Name: _____

Date: _____

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Operation Sheet 1	Ensure decision for dismantling and disposal
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Dismantle and Dispose one electronic device according to the following procedures.

Procedure:-

- Step1 Prepare yourself for the work
- Step3 Prepare tools and materials
- Step4 Set / put an electronics device which is dismantling and disposing properly
- Step5 Dismantle the device
- Step6 differentiate the disposal and reuse parts
- Step7 Maintaining (**replacing components if necessary**)
- Step 8 Assembling and packing the disassembled /dismantled part
- Step 9 Check the assembled part that you packed properly
- Step 10 check the output
- Step 11 submits you're project for your instructor

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LAP Test 1	Practical Demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks with in **1.30** hour

Task 1 Ensure decision for dismantling and disposal

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

- Preparing store house for dismantled equipment
- Fixing dismantling schedule and communicated to end users
- Decontaminating equipment (if necessary)

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:**

- Prepare store house for dismantled equipment
- Fixe dismantling schedule and communicated to end users
- Decontaminate equipment (if necessary)

Learning Instructions:

6. Read the specific objectives of this Learning Guide.
7. Follow the instructions described below
8. Read the information written in the information “Sheets”
9. Accomplish the “Self-checks” If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet”.
10. Do the “LAP test” (if you are ready).

- **Preparing store house for dismantled equipment**

If an item of Electrical Electronics Equipment has been unwanted by the holder into any waste collection system it will become WEEE. There will also be conditions where EEE is returned to a retailer and can be regarded as EEE until its status is known when it has been examined and tested.



Fig 2.1 Preparing store house for dismantled equipment

EEE from households

Situations where the EEE is not waste

- A householder has an item of EEE that needs to be repaired. They take it to a repairer who carries out the repair and returns the equipment to them.
- A householder has EEE that's in working order but they no longer want it and they decide to sell it or give it away.
- A householder purchases a new item of EEE and has their old equipment taken away by the retailer when the new item is delivered. In this circumstance the retailer should determine whether an item of equipment is waste.
- A householder has an item of used EEE that does not work but is not obviously beyond repair. They decide to donate it to a charity or community sector re-use refurbishment workshop.
- A householder returns EEE to a retailer under a retailer returns policy

Situations where the EEE is waste

- A householder has an item of used electrical equipment and returns it to a retailer offering in store take back for WEEE. There is clear intention by the householder to discard the used equipment and we consider it becomes waste at the retailer's premises. The retailer will be treated as the waste producer.
- A householder disposes of an item of EEE in their household waste bin or at a civic amenity site.

A householder arranges for their used equipment to be taken away by their local authority as part of the bulky waste collection service

- Store their waste properly to prevent it from harming the environment;
- Only pass it to someone authorised to deal with it;
- Pass a written description of the waste (Waste Transfer Note or Hazardous Waste Consignment Note) to the waste carrier, this note accompanies the waste and helps others know how to handle the waste.



Fig 2.2 Preparing store house for dismantled equipment

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Self-Check #1	Written Test
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Directions: Answer all the questions listed below.

Use the Answer sheet provided in the next page

Part I. Give Short answer (3 points each)

1. Preparing store house for the dismantled electronics equipment is very essential.
a) false **b>true**
2. Which one of the following is situations where the EEE is not waste?
 - a) A householder disposes of an item of EEE
 - b) A householder has an item of EEE that needs to be repaired
 - c) A householder returns EEE to a retailer under a retailer returns policy
 - d) all of the above are situations**

Note: Satisfactory rating – 2 points Unsatisfactory - below 2 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

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2.2 Fixing dismantling schedule and communicated to end users

Electronic packaging is the design and production of enclosures for electronic devices ranging from individual semiconductor devices up to complete systems such as a mainframe computer. Packaging of an electronic system must consider protection from mechanical damage, cooling, radio frequency noise emission and electrostatic discharge. Product safety standards may dictate particular features of a consumer product, for example, external case temperature or grounding of exposed metal parts. Prototypes and industrial equipment made in small quantities may use standardized commercially available enclosures such as card cages or prefabricated boxes. Mass-market consumer devices may have highly specialized packaging to increase consumer appeal. **Electronic packaging is a major discipline within the field of mechanical engineering.**

Electronic packaging can be organized by levels:

- "Chip", protecting a bare semiconductor diode from contamination and damage.
- Component, such as semiconductor package design and the packaging of other discrete components.
- Fixed wiring board (printed circuit board).
- Assembly, one or more wiring boards and associated components.
- Module, assemblies integrated in an overall enclosure.
- System, a set of modules combined for some purpose.

The same electronic system may be packaged as a portable device or adapted for fixed mounting in an instrument rack or permanent installation. Packaging for aerospace, marine, or military systems imposes different types of design criteria.

Electronic packaging relies on mechanical engineering principles such as dynamics, stress analysis, heat transfer and fluid mechanics. High-reliability equipment often must survive drop tests, loose cargo vibration, secured cargo vibration, extreme temperatures, humidity, water immersion or spray, rain, sunlight (UV, IR and visible light), salt spray, explosive shock, and many more. These requirements extend beyond and interact with the electrical design

An electronics assembly consists of component devices, circuit card assemblies (CCAs), connectors, cables and components such as transformers, power supplies, relays, switches, etc. that may not mount on the circuit card.

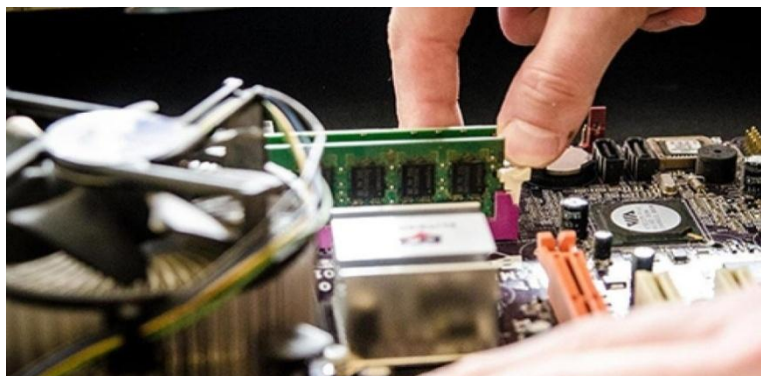




Fig2.2 Fixing dismantling decide

Self-Check #1	Written Test
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1. An electronics assembly consists of component devices are,

A. transformers B. power supplies B. relay **D. all**

2. Electronic packaging relies on mechanical principles are

A. Dynamics B. stress analysis C. heat transfer D. fluid mechanics E. all

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

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Information Sheet 3	Decontaminating equipment (if necessary)
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1.3 Decontaminate equipment (if necessary)

Equipment decontamination is a process which is designed to clean equipment after it has been contaminated or after it has been used in a situation in which contamination may have occurred. Equipment decontamination can be used to clean equipment after exposure to chemical, biological, or radiological contaminants, and also for the purpose of maintaining a “clean room” free of dust and other contaminants which could interfere with an industrial process.

Equipment used in environments where cleanliness is vitally necessary and contamination can occur on a regular basis has been designed for decontamination. It is made from materials which can easily be wiped down, for example, and the equipment will not be damaged by exposure to decontamination measures such as ultraviolet radiation, irradiation, soap and water, heat, and so forth. The equipment is usually designed to be decontaminated in a particular way. Some examples of this type of equipment include hospital equipment, equipment used in the manufacture of electronics components, equipment in chemical companies, and equipment used in food production

Electrolytic polishing is an anodic dissolution technique. The material to decontaminate is the anode, the cathode being either an electrode in stainless steel or copper (helping electrode) in an adapted form, or the decontamination tank itself. During decontamination, a controlled quantity of surface metal dissolves taking with it the contamination fixed in the surface layers. This technique is nowadays often used in fabrication, for surface treatment of pieces in stainless steel in order to obtain a very good finish by decreasing the roughness.

This improves the resistance to corrosion and also allows better and easier future decontamination.

The process is also applied for decontamination either in order to reduce the dose rate (typical case of the water boxes of steam generators), or to de-categorize pieces to be dismantled. If the technique is applied on pieces to be reused, surface finish is an important

Parameter to reduce the possibility of new contamination of the pieces, for pieces destined as scrap, surface finish is not as important as the efficiency of the decontamination and the volume of secondary wastes produced. The different used processes distinguish themselves by the used electrolyte and the operational conditions.

The first thing to do with any equipment involved in disaster is to ensure that there is no power to the equipment and it is not powered up for any reason. Then focus on stabilizing the equipment as soon as possible to retard the corrosion and contamination. Since

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corrosion depends on three factors working in concert; humidity, temperature and contaminants. The next step is to reduce the humidity in and around the equipment as soon as possible maintaining a moderate temperature while stabilizing the contaminants. A moderate temperature with low humidity will slow the corrosion rate significantly. **Remember** timing is very important, the faster the equipment is stabilized the higher the restoration success rate.

Listed below are some initial procedures to stabilize electronic equipment involved in water related disasters using the same guidelines as above.

Flood/Water damage:

1. Ensure power is removed.
2. Remove moisture (reduce humidity to less than 50% RH preferably less than 40% RH) using dehumidification.
3. Maintain moderate temperature.
4. Disinfect unsanitary or questionable water contaminated equipment with Microbar QGC using 2 ounces per gallon of water mixture. Spray outside surfaces of the contaminated equipment.

Fire, Smoke, Dust and other Contaminants:

1. Ensure power is removed.
2. Remove moisture (reduce humidity to less than 50% RH preferably less than 40% RH) using dehumidification.
3. Maintain moderate temperature.

Another option is to coat the equipment with water displacing oil or a corrosion inhibitor. This coating will provide several weeks of protection while decisions are being made concerning course of action to take. This coating must be removed prior to placing the equipment back into service. NOTE: This procedure cannot be used on all equipment types and a restoration specialist should be consulted.

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Self-Check #2	Written Test
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Directions: Answer all the questions listed below.
Use the Answer sheet provided in the next page
Part I. say true or false (3 points each)

1. Equipment decontamination is a process which is designed to clean equipment after used.

a)true b false

2. The first thing to do with any equipment involved in disaster is to ensure that there is no power to the equipment

a) false b) true

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

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Instruction Sheet	LG39: Organize resources needed
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- 3.1 Organizing work force and work assignments finalized
- 3.2 Insuring financial resources
- 3.3 Preparing necessary materials, ***tools and 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:**

- Organize work force and work assignments finalized
- Insure financial resources
- Prepare necessary materials, ***tools and equipment***

Learning Instructions:

11. Read the specific objectives of this Learning Guide.
12. Follow the instructions described below
13. Read the information written in the information “Sheets”
14. Accomplish the “Self-checks” If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet”.
15. Do the “LAP test” (if you are ready).

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3.1 Organizing work force and work assignments finalized

Work force is people engaged in or available for work, either in a country or area or in a particular firm or industry. Work organization is the way that tasks are distributed amongst the individuals in an organization and the ways in which these are then coordinated to achieve the final product or service. The quality of work organization may thus have an important impact on the performance of the organization

The process of dividing work into separate jobs and assigning tasks to workers is called division of labor. The degree to which the tasks are subdivided into smaller jobs is called specialization.

Work organization. the distribution and coordination of work tasks, skills and authority in an ORGANIZATION. Work organization is the way that tasks are distributed amongst the individuals in an organization and the ways in which these are then coordinated to achieve the final product or service.

Work organization is about the control of work and the division of labor. It includes the ... assignment of tasks and responsibilities, and training for the tasks being.

Electronics that cannot be reused can be dismantled for recycling, as they contain a variety of recyclable metals, plastics and glass. Many of these components contain harmful materials—such as lead, mercury, cadmium and flame retardants—and therefore require proper end-of-life management to protect workers and the environment.

4 Steps to Successfully Manage Your Workforce

1. Get to know your team
2. What you expect is what you get
3. Communicate with a glass half full
4. Who's responsible?

Work assignments are tasks given to workers that provide them with accountability during group activities. Assigning workers specific roles while performing group **work** clarifies the expectation of participation and gives workers responsibility and ownership over their learning



<https://houstonisdpsd.org> › flexicontent

www.businessdictionary.com › definition › workforce

Being an emerging issue, no resources have been allocated to the sector for e-waste management. Local authorities are already constrained in collecting solid wastes and e-waste is not seen as a priority. For implementation of e-waste strategy activities, Mainstreaming of e-waste management in various implementing budgets will be critical. Establishing and operational zing an e-waste fund will be a medium term measure to ensure sustainable financing of e-waste management

In terms of assessment of the decommissioning of the storage and/or combination facilities, consideration needs to be given to a number of factors.

First of all, the location of nearby populations and prevailing wind direction must be assessed in order to determine an appropriate site for the decontamination process to take place. Selection of the site should minimise or eliminate off-site effects. There must also be an assessment of the tank contents (i.e. the quantity of the residues and wastes and the quality of the various phases contained within the tanks). This will determine waste containment requirements and the most appropriate and cost effective route for treatment.

There must also be an assessment of the condition of the facilities, particularly corrosion of the tanks and their suitability for being lifted or relocated. Another factor to be assessed is the location of the redundant facilities.

Other hazards that may be present in the area must be considered, as well as the possibility for congestion during the demolition phase. The proximity of areas with personnel (such as

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control rooms) in relation to the decontamination site must also be taken into account, in order to determine whether any special provisions need to be put in place to protect workers in the vicinity. Other aspects that need to be assessed include the availability of: medical and first aid facilities for routine health monitoring and to provide emergency first aid; water in the area in the event of emergency fire fighting; ablution facilities and emergency showers for routine personal hygiene and emergency decontamination; and suitable facilities in the region to dispose of decontaminated steel.

Self-Check #1	Written Test
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Directions: Answer all the questions listed below.
Use the Answer sheet provided in the next page
Part I. Give Short answer (3 points each)

Work force is people engaged in or available for work in a particular firm or industry.

a)true b>false

Work assignments are tasks given to employer

a>true b>false

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

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Information Sheet 2	Insuring financial resources
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3.2 Insuring financial resources

Decommissioning cost estimates are generally based on a detailed decommissioning strategy and a detailed decommissioning plan, and may also be used as a basis for contracting, as a starting point for establishing a project baseline for costs and schedule management, and for cost accounting and scheduling purposes during the decommissioning operations. Reliable cost estimating is one of the most important elements of decommissioning planning.

Alternative technologies may be evaluated and compared on their efficiency and effectiveness, and measured against a baseline cost as to the feasibility and benefit derived from the technology. This principle ensures that the cost consideration is economically sound and practical for funding. This refers especially to decontamination and dismantling techniques because the scenario of the decontamination and dismantling of systems and structures has a major impact on the subsequent waste management activities and on the final state of the facility. These two aspects belong to the most important factors of decommissioning costing. Therefore, proper involvement of decontamination and dismantling techniques has one of the most important impacts on decommissioning costing.

In terms of assessment of the decommissioning of the storage and/or combination facilities, consideration needs to be given to a number of factors.

First of all, the location of nearby populations and prevailing wind direction must be assessed in order to determine an appropriate site for the decontamination process to take place. Selection of the site should minimise or eliminate off-site effects. There must also be an assessment of the tank contents (i.e. the quantity of the residues and wastes and the quality

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of the various phases contained within the tanks). This will determine waste containment requirements and the most appropriate and cost effective route for treatment.

Self-Check #2	Written Test
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1. Reliable cost estimating is one of the most important elements of decommissioning planning.

a) True b) false

2. Financial resource is one of the factor that should be considered during disposal of waste

a) True b) false

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

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Information Sheet 3	Preparing necessary materials, <i>tools and equipment</i>
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4.1 Preparing necessary materials, *tools and equipment*

Different types of hand tools and their operation

Common Electrical hand tools: Are tools commonly used to perform electrical works. These include

Screw drivers: are tools used to insert and tighten or to loosen and remove screws on electrical / electronic equipment

Screwdriver type	Head symbol	Head shape	screws
Slot-head			
Phillips			
Torx			
Allen Keys			

Fig.3.1 Different types of screw drivers

The common screw drivers are :

- a. Slotted(flat) Screwdriver is used to drive or fasten negative slotted screws**



Fig. 3.2 flat screw

driver

- b. Phillips Screwdriver –**

- ✓ **Used to drive or fasten positive slotted screws.**
- ✓ **It is a screwdriver that could take greater torque and could provide tighter fastenings**



Fig. 3.3 Phillips Screwdriver

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- **Pliers:** used to grip wire to: pull, bend, twist or splice, cut wires.
- These are classified as: combination, long nose, round nose cutting, diagonal cutting, needle nose pliers

Side cutting pliers: are used for cutting extra components leads and splicing wires



Fig. 3.4 Side cutting pliers

Long nose pliers: Consist of long, narrow tapered jaws

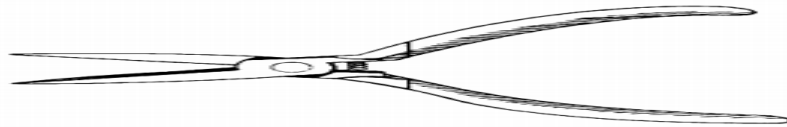


Fig. 3.5 Long nose pliers

Round Nose pliers: are used to make loops in wire and to shape light metal



Fig. 3.6 Round nose pliers

- **Slip joint pliers:** designed for holding and gripping heavy hardware to insert it in a chassis, where marring of the chassis surface is of no concern.
- These pliers are often used to insert a strain relief and grip large nuts and bolts to hold them in place.

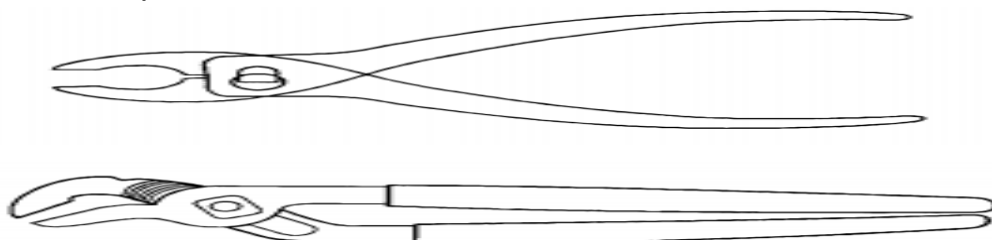


Fig. 3.7 Types of slip joint pliers

- ❖ Needle nose pliers: are used for holding small delicate work pieces in tight spots.



Fig. 3.8 Types of needle nose pliers

Diagonal cutting pliers is used for cutting small, light material, such as wire and cotter pins in areas that are inaccessible to the larger cutting tools.



Fig. 3.9 Diagonal cutting

plier

- ✓ **Electrician's pocket knife:** used to remove insulation of a wire.



Fig. 3.10 Electrician's pocket knife

- ✓ **Wire strippers:** are small, hand-held devices used to remove insulation from wires, to prepare the wire for electrical connection during assembly or service of electronic equipment



Wire strippers types	Manual	Automatic
Pictures		

Fig. 3.11 Types of wire strippers

Hammers: are classified as either hard or soft.

- Hard hammers have steel heads such as blacksmith types or mauls made for heavy hammering.
- Ball peen hammer is the one most frequently used by machinists.
- It has a rounded surface on one end of the head, which is used for upsetting or riveting metal, and a hardened striking surface on the other.
- Soft hammers are made of plastic brass, copper, lead, or rawhide and are used to position work pieces that have finishes that would be damaged by a hard hammer



Fig. 3.12 Ball peen hammer



Fig. 3.13 Plastic hammer

- **Wrench** is a basic tool that is used to exert a twisting force on bolt heads, nuts, studs, and pipes.
- The special wrenches designed to do certain jobs are, in most cases, variations of the basic wrenches that are described in this section

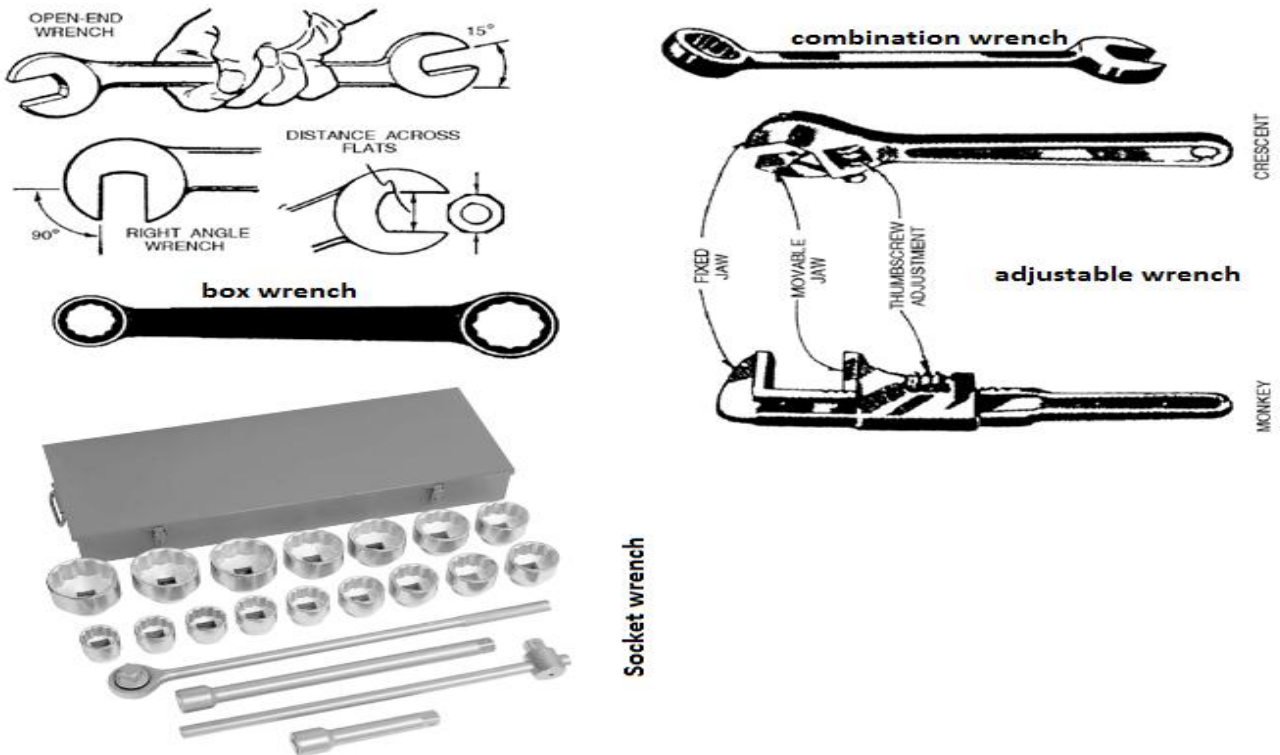


Fig. 3.15 Different type of Wrenches

Hacksaws are used to cut metal that is too heavy for snips or bolt cutters

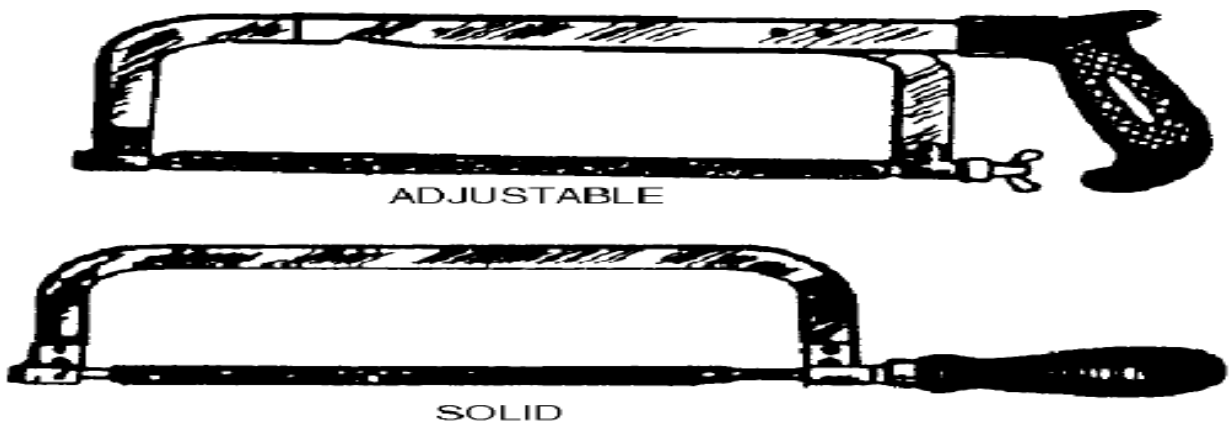


Fig.3.16 metal Hack saw

FILES

There are a number of different types of files in common use, and each type may range in length from 3 to 18 inches.

Files are **graded** according to the degree of fineness and whether they have single- or double-cut teeth

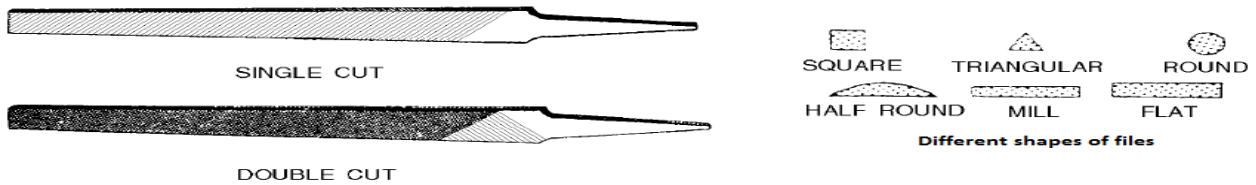


Fig.3.16 FILES

Chisels are tools that can be used for chipping or cutting metal.

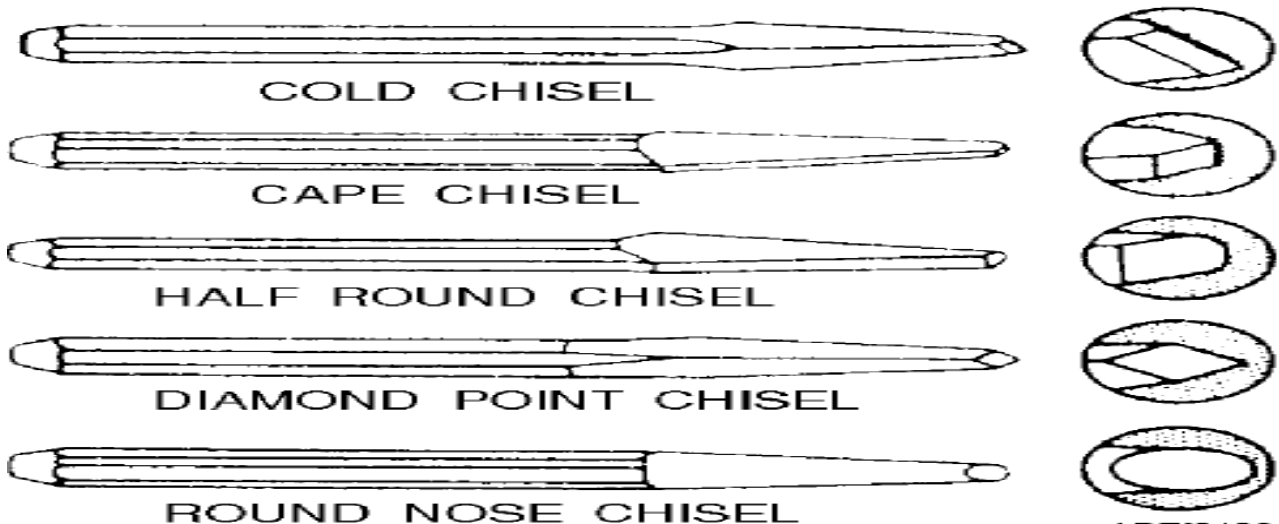


Fig.3.17 Different types Chisels

PUNCHES

A hand punch is a tool that is held in the hand and struck on one end with a hammer

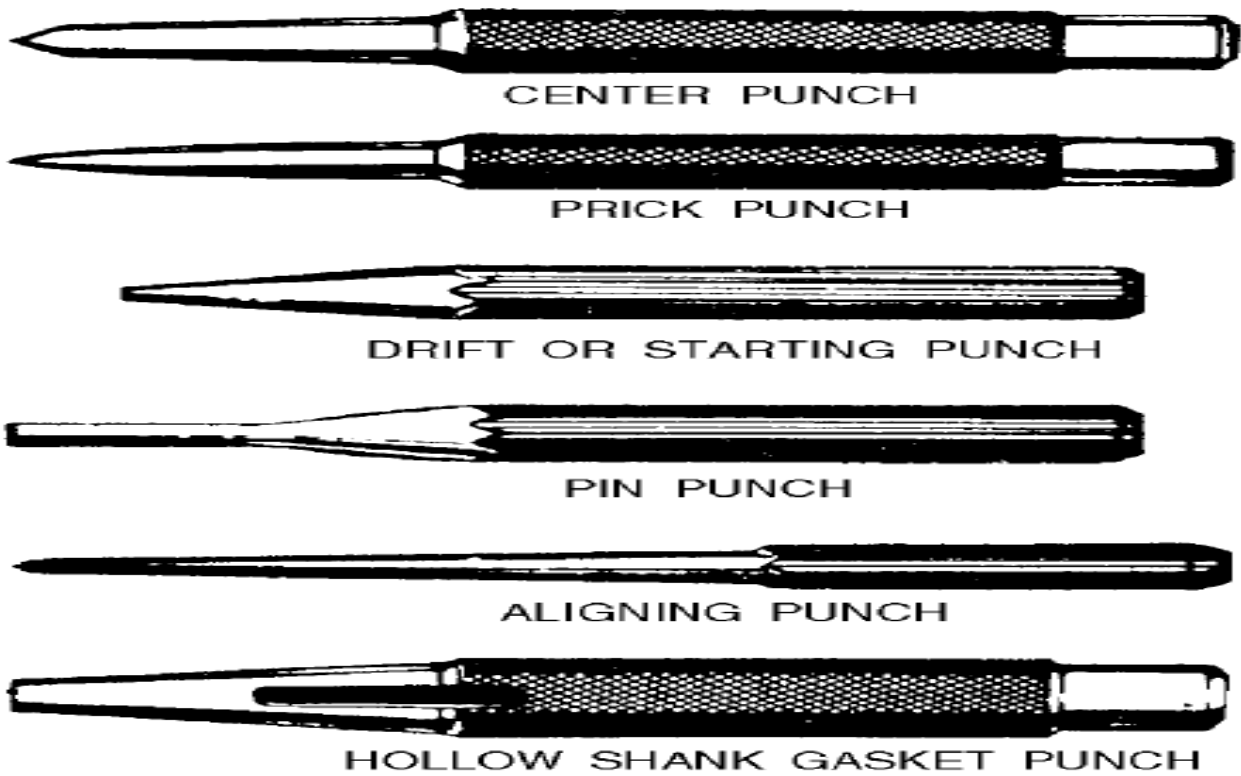


Fig.3.18 Different types PUNCHES

Test equipment is necessary for determining proper set-up, adjustment, operation, and maintenance of electrical systems and control panels



Fig.3.19 Different types MM

- ❖ **VOLTMETERS:** For measuring differences of potential (voltage) between two points in an electrical circuit.

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- ❖ The instrument is connected in parallel with the circuit being measured. Ranges vary from a few tenths volt to a few thousand volts.
- ❖ Instruments are capable of measuring both A.C. and D.C voltage
- ❖ **OHMMETERS:** For measuring the electrical D.C. ohm resistance of a circuit, circuit part, or component.
- ❖ Calibrated from zero ohms to infinite.
- ❖ Measures either series or parallel resistance
- ❖ **AMMETERS:** Measure magnitude of electrical current flow in an electrical circuit.
- ❖ When measuring D.C. currents, some types must be inserted in series with the circuit.
A.C

A **frequency meter** is an instrument that displays the frequency of a periodic electrical signal



Fig.3.20 KWh_meter

~	AC Voltage		Ground
	DC Voltage		Capacitor
Hz	Hertz	μF	MicroFarad
+	Positive	μ	Micro
-	Negative	m	Milli
Ω	Ohms	M	Mega
	Diode	K	Kilo
•)))	Audible Continuity	OL	Overload



Self-Check #3	Written Test
----------------------	---------------------

1. _____ ***is used to drive or fasten negative slotted screws***

A. screw driver B. frequency meter C. side cutter

2. _____ is necessary for determining proper set-up, adjustment, operation, and maintenance of electrical systems and control panels

A. screw driver B. Test equipment C. side cutter

3. _____ are used for holding small delicate work pieces in tight spots

A. screw driver B. Test equipment C. Needle nose pliers

Note: Satisfactory rating – 6 points Unsatisfactory - below 6 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

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

- Dismantling equipment following correct procedures and **OHS measures**
- Marking and labeling dismantled parts
- Cleaning and checking readied parts for packing
- Identifying and packing parts for reuse, disposal and reusable items/ identify reuse and disposed items for packing
- Identifying items to be disposed

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:**

- 4.1 Dismantle equipment following correct procedures and **OHS measures**
- 4.2 Mark and label dismantled parts
- 4.3 Clean and check readied parts for packing
- 4.4 Identify and pack parts for reuse, disposal and reusable items/ identify reuse and disposed items for packing
- 4.5 Identify items to be disposed

Learning Instructions:

16. Read the specific objectives of this Learning Guide.
17. Follow the instructions described below
18. Read the information written in the information “Sheets”
19. Accomplish the “Self-checks” If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet”.
20. Do the “LAP test” (if you are ready).

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Information Sheet 1	Dismantle equipment following correct procedures and OHS measures
----------------------------	--

4.1 Dismantle equipment following correct procedures and OHS measures

All electrical equipment as defined above shall be electrically tested and tagged in accordance with the procedure. The in-service safety inspection and testing of electrical equipment is only to be conducted by personnel who are competent to test electrical equipment.

4.1.1. Inspection

An **inspection** involves checking something, i.e., examining and assessing something. We may inspect a building or organization to make sure that it meets specific standards. Ensure that the equipment to be tested is not connected to the local electricity supply.

4.1.2.2. Conduct a visual and physical inspections looking for

- Obvious damage or defects in the accessories, connectors, plugs or sockets.
- Discoloration that may indicate exposure to heat, chemicals or moisture.
- Ensuring that flexible cords are effectively anchored to equipment, plugs and sockets.

4.1.3 Damage to flexible cords:

- The inner cores of flexible supply cords are not exposed or twisted;
- The external sheaths are not cut, abraded, twisted, or damaged to such an extent that the inner cores are visible;
- Unprotected conductors or insulation tape are not in evidence.
- Power boards, that the warning label indicating the maximum load to be connected to the device is intact and legible.
- Controls are in good working order, i.e. they are secure, aligned and appropriately identified.
- Covers, guards and shield etc are secured in the manner intended by the manufacturer or supplier.
- Ventilation inlets and exhausts are unobstructed.

4.1.4. Testing

The purpose of testing is to detect the unobservable faults not found by the visual Inspection process. It is preferred that insulation resistance tests are performed where practical.

4.1.5 Leakage Testing

If electrical equipment is to be energised to close or operate a switching device, then a leakage test shall be performed. Many power tools and most modern office equipment use membrane type on/off electronic switches. These appliances must be powered up to get past the electronic or magnetic switches.

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Self-Check -1

Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. An **inspection** involves checking something, examining and assessing something
a) False b) true

Note: Satisfactory rating - 5 points

Unsatisfactory - below 5 points

You can ask your teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

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Information Sheet- 2	Marking and labeling dismantled parts
-----------------------------	--

4.2 Mark and label dismantled part

4.2.1 Marking dismantled parts

PCBs, micro-controllers (chips), light bulbs (lamps), plugs, fiber optics, diodes, cables—the smallest parts often have to be marked in the electrical and electronics industry. LEIBINGER inkjet printers code products at a font height down to 0.8 mm (JET3up MI). In addition, LEIBINGER printers work with contrast inks (pigmented or soft-pigmented inks), which guarantee that the font is raised from the background, which makes it clearly legible. The camera verification systems from LEIBINGER monitor fixed and variable data, text segments and barcodes.

Typical markings

- Batch numbers/lot numbers
- Characters and text
- Company logos Meter marking

4.2.2 Label

In the context of this standard, responsibility extends to dismantling the asset to a specified degree but you may alter and/or vary the sequence of actions and techniques followed at your discretion to achieve the best possible result in the conditions applying. In some cases, you may still be expected to refer to others for final authorisations, even though you remain responsible for identifying and implementing decisions.

Type of material to be dismantled

The assets to be dismantled involve more than one technology and/or a significant number of components are of a fragile/valued nature.

Typical assets could include:

- Rotating equipment and tools
- Protection methods
- Electrical distribution systems
- Battery systems.

Dismantling process is full of risk, so it should be:

- Assessed by a qualified health, safety and environmental management specialist.
- An environmental plan must be in place to provide guidance on how the environment will be protected from ground, water and air emissions.
- All equipment used in the process should contain no reactive metal parts.
- Steps should be taken to reduce the flammable atmosphere.
- An emergency plan must be in place to deal with unforeseen incidents.

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Self-Check #2	Written Test
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1. Marking dismantled parts?

2. What is Labelling electrical equipment mean?

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

Scored Points

Part I

1. _____

2. _____



Information Sheet- 3	Clean and check readied parts for packing
-----------------------------	--

4.3 Clean and check readied parts for packing

Cleaning a PCB (Printed Circuit Board) effectively relies on using the right methods and tools. The easiest ways will use:

Employ a soft brush and lint-free cloth, too, to ensure nothing gets damaged.

Using Compressed Air to Clean PCBs

For simple repairs, compressed air provides an unobtrusive way to free up any dust resting on the electronics or inside the machines and blow it out. Use short bursts to spray the air inside the ventilation ports. If you're not satisfied with the dust removed, open the device with a screwdriver and work your way around the components, carefully cleaning the circuitry with the air.

4.3.1 Using Baking Soda to Clean PCBs

- Baking soda, or sodium bicarbonate, is an effective means of removing grime with minimal risk of damaging the board. Baking soda is most effective when treating corrosion, as it dissolves the troubled area and neutralizes the acidic qualities of the residue.
- Using Isopropyl Alcohol to Clean PCBs Isopropyl alcohol is a great PCB cleaner because it is inexpensive and evaporates quickly.

4.3.2 Using Distilled Water to Clean PCBs

- Distilled water triumphs over any other form of liquid when mixing your cleaning solution due to the absence of ions conductive to electric devices. Pure distilled water will not degrade electronic devices, as it is a very poor conductor.

4.3.3 Using Household Cleaners to Clean PCBs

- A phosphate-free household cleaner should also be in your arsenal Tools for Cleaning Printed Circuit Boards
- Your choice of brush is also important in the cleaning process. Selecting a brush that has soft bristles and is small enough to reach small places is the best pick.
- Lint-free towels like microfiber cloths should be handy to rub down and dry off your delicate circuit boards.
- You can also utilize household appliances such as the oven to accelerate the speed of drying.

4.3.4 How to Clean Corrosion From a Circuit Board

- The tools needed while handling a corroded device include common household items, and your company can use careful tactics that should not prove to be difficult for those in the electronics field.
- Once you have gathered the necessary tools and materials, it is time to create your cleaning solution and prepare your circuit board for restoration.

4.3.5 How to Clean a Circuit Board That Got Wet

- A liquid such as water, industrial substances and more often find their way into electronics.

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- The first steps for how to clean a circuit board that has been exposed to water involve basic safety and straight-forward methods for extracting any moisture within the device:
 - i. Disconnect the device before handling it
 - ii. Turn off the device
 - iii. Rotate and shake the device to drain fluid
 - iv. Remove battery
 - v. Disassemble what you can of the device to further allow water drainage.

If your equipment still experiences issues, cleaning the circuit board itself comes next. Follow these steps:

- Completely disassemble the device. Disconnect all cables and open connectors, and remove shields to gain complete access underneath the circuit board. Place your circuit board in an appropriately sized vessel with enough 90% or higher isopropyl alcohol to submerge it after removing any external technology
1. Power off the equipments and unplug it or remove its battery to protect against accidental activation. Open the case housing of the equipment mechanical parts. Examine the interior workings for rust damage. Remove any corroded parts, using the equipment manual for guidance.
 2. Clean the equipment, including the mechanical components, with mineral spirits and a rag to remove any dirt or grease
 3. Use blower to clean the electrical part of the equipments.
 4. Fill a bowl or other container with undiluted white vinegar. Place any smaller or more intricate parts, such as screws or mechanism, in the vinegar. Allow the rusted mechanical parts to soak overnight to loosen the rust.
 5. Apply naval jelly onto the rusted parts. Sand all visible rust from the equipment using coarse-grit sandpaper or a wire brush. Rinse any parts with warm water and allow them to dry completely.
 6. Wash the equipment with mineral spirits, and then dry the equipments. Apply cold galvanizing spray to the equipment to prevent against future rust. Allow the spray to dry. Spray a lubricant that protects against rust, such as Topcoat or WD-40, on any moving parts or work areas.
 7. Reassemble the equipment. Apply any needed grease. Restore power to the equipments.

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Self-Check #3	Written Test
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Directions: Answer all the questions listed below.

Use the Answer sheet provided in the next page

Part I. Give Short answer (3 points each)

- c) Write the steps how to clean by using Baking Soda?
- d) How to Use Household Cleaners to clean electronics equipment?

Note: Satisfactory rating – 4 points Unsatisfactory - below 4 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

Scored Points

Part I

- 1. _____

- 2. _____

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Information Sheet- 4	Identifying reuse and disposing items for packing
-----------------------------	--

4.1 Identify reuse and disposed items for packing

4.1.1 Reuse /Recycling

Domestic recycling includes sorting, dismantling, mechanical separation and recovery of valuable materials. Recycling of used electronics can yield materials (e.g., gold, copper, glass, aluminum) that can be returned to the supply chain to be used again, reducing raw materials used and the overall need for disposal. Over time, better and more efficient recycling technologies can be developed.

Preventing waste in the first place is preferable to any waste management option, including recycling. Donating used (but still operating) electronics for reuse extends the lives of valuable products and keeps them out of the waste stream for a longer period of time. Recycling electronics helps reduce pollution that would be generated while manufacturing a new product and the need to extract valuable and limited virgin resources. Electronic recycling also reduces the energy used in new product manufacturing.

At all times, additional assets or materials should be disposed of in a way that maximises returns whilst maximising open, transparent and effective competition. Most commonly this will be through publicly competitive process of public auction or through a secure electronic tendering/ auctioning facility.

Prior to disposal, a reasonable effort is to be made to ensure no other Council Directorate has a need for the asset. Items of historical or cultural significance should be given special regard and any dangerous goods disposed of only in an authorised and safe manner. No warranty is to be offered on assets sold.

Conflict of Interest

The officer responsible for the disposal of any Council asset and the relevant Director must ensure that no conflict of interest occurs in or as a result of the asset disposal process.

Reasons for disposal

A decision to dispose of an asset may be based on one or more of the following:

- Obsolescence.
- Non-compliance with occupational health and safety standards.
- No use expected in the foreseeable future.

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- No usage in the previous 6 months (Stores Stock items).
- Optimum time to maximise return.
- Discovery of hazardous chemicals or materials present in the asset.

Self-Check #4	Written Test
----------------------	---------------------

**Directions: Answer all the questions listed below.
Use the Answer sheet provided in the next page
Part I. Give Short answer (3 points each)**

1. What is reuse and disposed items for packing electronics?

Note: Satisfactory rating – 5 points Unsatisfactory - below 5 points

You can ask your teacher for the copy of the correct answers

Answer Sheet

Scored Points

Part I

1. _____

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Information Sheet- 2	Identifying items to be disposed
----------------------	----------------------------------

4.5 Identify items to be disposed

Most type of electronic and other type of disposable waste materials are:

- **Batteries:** These include alkaline batteries, nickel-cadmium rechargeable batteries, lithium-ion batteries, and lead acid batteries.
- **Metals:** Metals including steel, iron, aluminum, and copper.
- **Plastics:** Plastics make up about 17% of electronics. Thermo set plastics like ABS (Acrylonitrile Butadiene Styrene), PVC (polyvinyl chloride), PC (poly carbonate), HIPS (High impact polystyrene) and blends of ABS/PVC, PC/ABS form the biggest percentages.
- **Printed wire/circuit boards Cathode Ray tubes (containing lead, beryllium, phosphorus):** CRT monitors and TVs contain an average of 1.8 kg of lead and cadmium each and these need to be handled carefully and separately.
- **Hazardous fraction (PCB in capacitors, florescent lights, batteries):** For all the parts that are identified to have no secondary value or are hazardous, these will be disposed of either by controlled incineration or disposed of in underground landfill sites that have leach ate control

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Self-Check #5	Written Test
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Directions: Answer all the questions listed below.
Use the Answer sheet provided in the next page
Part I. Give Short answer (3 points each)

1. Discuss items to be disposed?

Note: Satisfactory rating – 5 points Unsatisfactory - below 5 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

Scored Points

Part I

i. _____

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Instruction Sheet	LG41: Dispose the equipment
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Consult and obtain concerned body approval for disposal
- Dispose equipment off following disposal **procedures and regulations**
- Prepare disposal report using approved format
- Discard equipment following discarding procedures
- Accomplish necessary reports and documents in accordance with the company standard 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:**

- 5.1 Consult and obtain concerned body approval for disposal
- 5.2 Dispose equipment off following disposal **procedures and regulations**
- 5.3 Prepare disposal report using approved format
- 5.4 Discard equipment following discarding procedures
- 5.5 Accomplish necessary reports and documents in accordance with the company standard procedures

Learning Instructions:

21. Read the specific objectives of this Learning Guide.
22. Follow the instructions described below
23. Read the information written in the information “Sheets”
24. Accomplish the “Self-checks” If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet”.
25. Do the “LAP test” (if you are ready).

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Information Sheet-1	Consult and obtain concerned body approval for disposal
----------------------------	--

5.1 Consult and obtain concerned body approval for disposal

- a) There are specific government regulations relating to the disposal of Waste Electrical and Electronic Equipment (WEEE). When disposing of any such equipment, departments should refer to health safety and environmental guidelines on the Health, Safety and Environment website.
- b) For further advice on following this directive assistance can be given by the Head of the Health, Safety and Environment Office.
- c) In particular ensure all Refrigerators; Freezers and other waster electrical and electronic equipment have been decontaminated using an appropriate approved University Health, Safety and Environment procedure.
- d) Prior to making a sale of any electrical and/or mechanical equipment the University Health Safety & Environment Office must be consulted. The piece of equipment may needs to be checked before sale or donation to third parties and provided with either a certificate that it is safe to use OR a note describing what safety flaws it has and what will be required to bring it up to current standards.

Research Fixed Asset Disposal Policy:

- a) It is the responsibility of Institute Directors to appraise and sign-off any disposal of Research Assets within their institute. This may be particularly important if an item of equipment is jointly held between Departments or Institutes. The ownership of grant funded assets and any sale restrictions imposed by the funding body must also be confirmed
- b) Conditions of the research grant are paramount and must be adhered to.
- c) In the case of Senior Researchers leaving the University to take up posts in other universities where their research will continue, it is permissible, subject to agreement with the Head of Department/Accountable Budget Controller, and the conditions of the research grant which funded the equipment that their research equipment can be taken with them. If this involves the transfer of computer equipment, arrangements must be made to remove any software which is licensed to the University, prior to the item being removed. The University will not be pay for any transfer and decommissioning cost.
- d) Any assets lent to another HE institution should be done so under their insurance, noting that any damage must be reimbursed.

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Self-Check #5.1	Written Test
------------------------	---------------------

Directions: Answer all the questions listed below.
Use the Answer sheet provided in the next page
Part I. Give Short answer (3 points each)

1. What is dismantling electronics?
2. What is disposal electrical equipment mean?

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

Score

Part I

b. _____



Information Sheet-2	Dispose equipment off following disposal procedures and regulations
----------------------------	--

5.2 Dispose equipment off following disposal **procedures and regulations**

❖ **Procedures and regulations**

At all times, extra assets or materials should be disposed of in a way that maximises returns whilst maximising open, transparent and effective competition. Most commonly this will be through publicly competitive process of public auction or through a secure electronic tendering/ auctioning facility.

Prior to disposal, a reasonable effort is to be made to ensure no other Council Directorate has a need for the asset. Items of historical or cultural significance should be given special regard and any dangerous goods disposed of only in an authorised and safe manner. No warranty is to be offered on assets sold.

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Fig5.2 Procedures and regulations

Conflict of Interest

The officer responsible for the disposal of any Council asset and the relevant Director must ensure that no conflict of interest occurs in or as a result of the asset disposal process.

Reasons for disposal

A decision to dispose of an asset may be based on one or more of the following:

- Obsolescence.
- Non-compliance with occupational health and safety standards.
- No use expected in the foreseeable future.
- No usage in the previous 6 months (Stores Stock items).
- Optimum time to maximise return.
- Discovery of hazardous chemicals or materials present in the asset.

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- Uneconomical to repair.

Self-Check #5.2	Written Test
-----------------	--------------

Directions: Answer all the questions listed below.

Use the Answer sheet provided in the next page

Part I. Give Short answer (3 points each)

- e) What are the procedures to disposing electronics?
- f) What is disposal electrical equipment mean?

Note: Satisfactory rating – 4 points Unsatisfactory - below 4 points

You can ask you teacher for the copy of the correct answers

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Answer Sheet

Scored Points

Part I

1. _____

2. _____

Information Sheet-3	Prepare disposal report using approved format
----------------------------	--

3.5 Prepare disposal report **using approved format**

A maintenance report form is a document that is used to keep maintenance record of different things at a different level. Factories, workshops, and other maintenance shops can make the best use of this form. The form in itself is an organized way to keep a record for future use also. Each time maintenance has been made and recorded in report form can be very handy at next maintenance time.

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In this particular form user may need to write in two parts:

- General information about the person or department who is preparing maintenance report. In general, it is required to write people or department's name, complete address, contact number, email, and fax. Information about the person preparing report could be his/her designation, contact number, and email.
- **Detailed report itself:** Information related to **maintenance report** can be maintenance date and time, location, maintenance purpose, nature of maintenance, brief description of maintenance, details of nature and repair of breakage, replacement of spare parts, any major complaint and its replacement, suggestions for improvement and development for the repaired parts, extra remarks from maintenance engineer, signature and report submission from the maintenance engineer.

Equipment Maintenance Report			
Name of Equipment			
Label:			
Serial number:			
Manufacturer:			
Date:	Maintenance Description	Maintenance performed by:	Date of validation before put into service:

At the end, amount payment information will be recorded. A **sample free printable maintenance report form** has been attached here. The form is fully equipped to contain all above-mentioned details. One can download, edit or print this form as per one's requirement. A preview is also given to having quick look at its appearance



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Self-Check #5.1	Written Test
------------------------	---------------------

1.A maintenance report form is a document that is used to keep maintenance record

- a) True b>false

Note: Satisfactory rating – 10 points

Unsatisfactory - below 10 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

Scored Points

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Information Sheet-4	Discard equipment following discarding procedures
----------------------------	---

5.4 Discard equipment following discarding procedures

Just because an item of equipment has been discarded and been classified as waste does not mean that it must be destroyed or that it cannot be repaired or refurbished and put back into use. However, for as long as an item is waste, waste management controls will apply.

Disposal is an important part of e-recycling. All your electronic equipments need a proper disposal to reduce their poisonous effects. Use double plastic-bag to dispose fragile materials, such as fluorescent light bulbs. Follow the guidelines given in the manual of the product prior to making a disposal.

When discarding the electronic equipments that have toxic liquid materials, you must follow the standard operating procedure (SOP) before dumping it into the garbage. LCD contains mercury that might contaminate the water and affect the environment. So, you must dispose of electronic materials that contain any such liquids. Read the user manual for proper guidelines



Fig4.1 Discard equipment

Electronic waste (sometimes called e-waste) is a term used to describe electronics that are nearing the end of their useful life and are discarded, donated, or recycled. Although donating and recycling electronic devices conserves natural resources, you may still choose to dispose of e-waste by contacting your local landfill and requesting a designated e-waste drop off location. Be aware that although there are many options for disposal, it is your responsibility to ensure that the location chosen is reputable and certified.

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Self-Check #5.4	Written Test
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1. Equipment to be discarded needs discarding procedures

- a) True b)false

Note: Satisfactory rating – 3 points Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

Scored Points

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Information Sheet-5	Accomplish necessary reports and documents in accordance with the company standard procedures
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5.5 Accomplish necessary reports and documents in accordance with the company standard procedures

The **purpose** of this section of the guidelines is to describe what an organization should have in place in terms of policies, procedures, standards and documentation for a digitization program.

Introduction

It is essential that an organization embarking on a digitization program has policies and procedures that are documented, based on recognized standards and communicated to relevant staff.

Policies

Some policy decisions need to be made and documented as part of digitization programs. For example, policies may be established on:

Procedures

Procedures can ensure that employees involved in a digitization program clearly understand what their roles and responsibilities are and how to perform them. Where original paper records are destroyed, documented procedures may also be required to demonstrate in court that a sound process for creating digital images to replace them was followed.

Procedures need to make it clear how digitization is integrated into the business process. They should address the following:

- when and where the records will be digitized and, if relevant, how they will be retrieved and transported
- How to prepare the original paper records for digitization - see *Managing original paper records* for more information
- steps in creating digital images using hardware and software (including the creation of versions, masters and derivatives and acceptable enhancements that can be made)
- Capturing and checking metadata - see *Metadata requirements* for more information
- quality assurance checks - see *Benchmarks and quality assurance* for more information
- Any security/access issues affecting the original paper records, the digital images and their delivery to stakeholders
- Capture and management of digital images, including storage methods, backup procedures etc. - see *Managing digital images as records*
- Handling and management of original paper records after digitization - see *Managing original paper records*
- Disposal of original paper records (where relevant) - see *Disposal of original paper records after digitization*

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- When disposal of digital images is appropriate (e.g. the disposal of poor quality images that have been rescanned, versions prior to enhancement etc.)

Standards

For any digitization programs you will need to meet the minimum compliance requirement in Principle 6 of the *Standard on the physical storage of State records* that 'records are handled carefully during conversion and converted according to recognized standards'.

Images will need to be full and accurate representations of the original records to meet the requirements in the Standard on records management.

Note: If you do not plan to destroy original paper records you should, if possible, still try to ensure your program can meet the conditions for destruction in the *General retention and disposal authority: original or source records that have been copied*. These represent best practice and meeting them will ensure that your organisation can destroy the original records if destruction becomes an option for consideration in the future.

Documentation

It is important that your organization documents its digitization program. These records are your evidence that you have applied rigor to the digitization process.

If the digital images will replace original paper records, and therefore need to function as evidence, you will need to employ greater levels of documentation. This will be a safeguard if the authenticity of the digital images is challenged.

Levels of documentation required should be based on a proper assessment of risk. Depending on the risk, you may need to consider keeping the following documentation:

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Self-Check #5.5	Written Test
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What is dismantling electronics policy?
Discus about documentation?
What does standard mean?

Note: Satisfactory rating – 9 points Unsatisfactory - below 9 points

You can ask you teacher for the copy of the correct answers

Answer Sheet

Scored Points

Part I

1. _____

2. _____

