Basic Home/Office Electrical/Electronic Equipment Servicing Level II

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Module Title: Dismantling and Disposing Home/Office Electrical/Electronic Equipment

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L #37	LO #1- Ensure decision for dismantling and disposal

Instruction sheet

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

- Identifying Equipment
- Obtaining Approval
- Informing end users

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

- Identify Equipment
- Obtain Approval
- Inform end users

Learning Instructions:

Read the specific objectives of this Learning Guide.

1. Follow the instructions described below.
2. Read the information written in the "Information Sheets". Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
3. Accomplish the "Self-checks" which are placed following all information sheets.
4. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

LO#1	Ensure decision for dismantling and disposal

Information Sheet 1: Identifying Equipment

1.1. Identifying Equipment

You must identify every piece of your equipment in the system before you can use Equipment. After you create the necessary equipment identification information, you can:

- Bill jobs, or business units, for the use of the equipment
- Conduct online equipment status, location, and activity searches
- Track equipment's historical, current, and planned physical locations
- View assembly components individually or in groups
- Keep detailed maintenance and project logs
- Account for equipment in quantities

Identifying equipment consists of the following tasks:

- Creating an equipment master
- Entering detailed information
- Searching for equipment information
- Locating parent and component information

1.1.1 Types of Equipment Identification Information

You can establish three types of equipment information for your system:

- Equipment master information
- Supplemental and specification data
- Message logs

You must create an equipment master for every piece of equipment in order to use the system's management features. You can also include supplemental data and message logs to further define equipment in the system.

1.2. Equipment Master Information

The equipment master consists of the basic information that defines a piece of equipment. You must create equipment masters to manage equipment inventory, costs, warranties, billing, preventive maintenance, and so on.

You use the equipment master to complete the following Equipment Billing tasks:

- Set up equipment for location and billing processing
- Set up parent and component relationships

1.3. Supplemental and Specification Data

You can enter supplemental data to record information that is important to your company but is not included on the equipment master [1]. Enter specification data to record static information about equipment. You define and maintain the databases for both supplemental and specification data. You can set up data types that use a columnar format, text format or both. You can also set up security for supplemental and specification data by user identification.

Message Logs

Use message logs to record and track short informational messages about equipment that the equipment master and supplemental data forms cannot accommodate. For example, you can use message logs to:

- Log problems or complaints about a specific piece of equipment
- Plan scheduled or preventive maintenance
- Report on actual maintenance

You can use paragraph, outline, or any other format you choose to enter information in message logs.

Category Codes and Equipment Identification

Set up category codes to further classify equipment for tracking, reporting, and DREAM Writer data selection throughout the system. You can define up to 23 category codes to meet your company's information needs. Use these category codes in equipment masters to describe equipment and group similar types of equipment.

If you use Equipment Billing with the JD Edwards World Fixed Assets system, the two systems access the same category code tables. The system displays the first 5 or first 10 category codes on the Equipment Search form. Equipment Billing users frequently use the first ten category codes as selection criteria for multiple tasks, such as selecting equipment for updating meter readings, selecting equipment to enter location information, and so on. You should reserve as many of the first 10 category codes in the equipment master as you need for equipment management purposes.

Equipment Identification Numbers

You can use up to three numbers to identify equipment throughout your system:

- Item number
- Unit number
- Serial number

Different branches of your company might refer to equipment in different ways. For example, accounting personnel might identify equipment by an item number. Maintenance personnel might refer to equipment by the manufacturer's serial number or a company-assigned unit number.

Every equipment master in your system must include an item number. You can enter unit and serial numbers if you need to. You must define which of these numbers is used as the primary number for identifying equipment in your system. Any identification number that you assign to a piece of equipment on the equipment master must be unique throughout your entire system.

Parent and Component Relationships

You can set up parent and component relationships to group individual pieces of equipment. For example, when you create master information, you can identify a building as a parent item. One of its components might be an air conditioner. The component of one item can also be the parent of another. For example, the air conditioner might be the parent of a number of components including filters, a fan and a compressor. Those components in turn might be the parents of still other components, and so on.

You can establish up to 25 hierarchical levels of a parent item. The system assigns each component a number according to its level in the hierarchy. This is particularly useful for tracking complex equipment assemblies.

The following graphic illustrates how parent and component relationships might be set up for equipment:

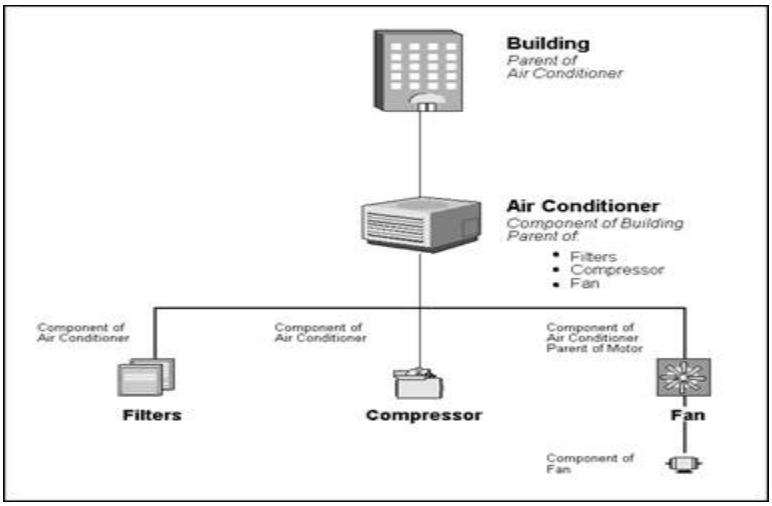

Figure 1.2. Parent and Component Relationships

Self-Check1	Written Test

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

I. Discuss the following Questions.

1. Discuss Equipment Master Information (5 point)
2. Discuss consistency of identifying equipment (5points)?
3. Parent and Component Relationships (5points)?

Part II

II. Choose the correct answer for the following questions (each 5 point)

1. Which types of equipment information for your system:
   a. Equipment master information
   b. Supplemental and specification data
   c. Message logs
   d.all
2. numbers to identify equipment throughout your system are

a. Item number c. Serial number

b. Unit number d. all

3. Use the equipment master to complete the Equipment Billing tasks:

   a. Set up equipment for location and billing processing

   b. Set up parent and component relationships

   c. a and b

   d. all

Note: **Satisfactory rating 30 points** **Unsatisfactory - below 30**

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

Score = _____
Rating: _____

Information Sheet 2:- Obtaining Approval

2.1. Obtaining Approval

2.1.1. Disposal Hierarchy

when equipment becomes redundant for its original use then the following disposal hierarchy should be followed:

1st.	Reused within the Directorate;
2nd.	relocate within the Trust;
3rd.	sale, part-exchange or donation;
4th.	sustainable disposal.

2.1.2: Disposal Process.

Where appropriate, the Asset Budget Holder must ensure equipment that is being sold or donated has been appropriately decontaminated with a decontamination certificate (e.g. medical equipment) or has the appropriate safety sticker / certificate / British Standards label (e.g. electrical equipment must have an up-to-date PAT test sticker, upholstered furniture must have a flame retardant label). Advice can be sought from the Procurement team or appropriate Trust stakeholder.

The Procurement team is responsible for facilitating the sale of any unwanted Trust equipment, including but not limited to:

- Contacting companies that specialize in auctions and disposal,
- Negotiating the sale or disposal arrangements, and
- Processing the sale

2.1.3. After disposal:

The Asset Budget Holder is responsible for returning an electronic copy of the Asset Disposal Form to the Finance Department and where appropriate, the Medical Devices Adviser. The Finance Department and Medical Devices Adviser must ensure all appropriate asset registers or inventories are suitably amended [2].

The Asset Budget holder is responsible for sending the original Asset Disposal Form together

with any associated legal documentation (e.g. deed of gift) to the Legal &Property Team within the Estates Services department. Except for sales; where the Asset Budget Holder is responsible for sending the original Asset Disposal Form to the Procurement team, who will complete any associated legal documentation (e.g. deed of sale) and return all original documents to the Legal &Property Team.

The Asset Budget Holder should also ensure, where applicable insurance and any maintenance arrangements have been revised. Advice can be sought from the Procurement team. Disposal channels are available for when equipment reaches the end of its life

• When disposing equipment the environment is considered

• There are clear regulations on waste disposal

• Companies that buy old equipment exist

• Decommissioning regulations exist, e.g. erasing of patient data and decontamination and the technicians know how to do this

• When purchasing new equipment the supplier may take responsibility for the equipment that is being disposed

Create awareness and share best practices on disposal from the UK

• Awareness-raising, explain the environmental impact

• Encourage hospitals to create disposal routes and raise awareness on Ministry level

• Teach technicians how to decommission, e.g. decontaminate and erase patient data

• Include disassembly and disposal of equipment in the tender specifications, consider if that is acceptable for the owner (the hospital/MoH might see a value

auction to scrap buyers. Try to convince that cleaning up is a more suitable solution than keeping a junkyard)

Assumptions

• Data is accessible and of adequate quality to demonstrate progress, understand successes and challenges

• Staff understand the importance of data collection, management, and analysis

• Staff are willing to undertake monitoring and evaluation tasks

• Staff reflect on findings from the data to review practices and implement change where it's needed

• There is resource to transform data into information that can be used to engage with

stakeholders

• There is an appetite to engage with stakeholders with findings from institution data

• The institution fosters a culture of learning

Mitigations:

• Include exploration and discussion of data accessibility in the planning phase of the project. Where data is missing, establish a means to gather the data or agree proxy measures.

• Gain consensus for data collection tools, especially if introducing a new tool and wherever possible, use existing data collection systems/tools

• Decide on what data is actually needed, and limit collection to that

• Include training on data collection, management and analysis in the project plan. Seek out individuals willing to champion the importance of data

• Plan for regular project meetings that include data review and action components

• Discuss who your stakeholders are, what they want to know about the project, and how best to provide them with this information e.g. in a project meeting, a report, a poster, etc For more information on evaluation and learning, that has tools and guidelines for health partnerships to assist them with

Monitoring and evaluation.

Decontamination entails a combination of processes used with the intention to make a device safer for handling by staff and for further use

The effective decontamination of reusable devices is essential in reducing the risk of transmission of infectious agents. This guidance also needs to be applied to demonstration units as these typically move freely between clinical areas and users.

PROCEDURE TO OBTAIN APPROVAL FOR ELECTRICAL INSTALLATION		
Sl.No.	Questions	Answers
1.	Whether it is mandatory to obtain Approvals for Electrical installations?	Yes,
2.	Can we choose a common man having basic electrical knowledge to carryout electrical installation works?	No,
3.	Whom to approach to obtain electrical safety approvals	**Concerned jurisdictional office of Electrical Inspectorate**
4.	When should I approach Electrical Inspectorate dept?	After obtaining the required power sanction approval from the concerned ESCOMS & before commencement of electrical Installation works.
5.	What are the steps involved in obtaining the electrical safety certificates.?	➢ Obtaining the Approval for proposed Electrical Installation Drawings ➢ Carry out the Electrical Installation works under the provisions of Central Electricity Authority(Measures relating to safety and electric supply)Regulations 2010 , as per approved drawings through an LEC ➢ Completed electrical installation work shall be got inspected by concerned officers of Electrical Inspectorate dept ➢ After inspection If an inspecting officers ensures that the said electrical installation is in general conformity with Central Electricity Authority(Measures relating to safety and electric supply)Regulations 2010,necessary safety approval will be issued else, defects if any intimated by the officer shall be complied within specified period to obtain the same. ➢ Further, on verification of compliance report the inspecting officer himself or the concerned officer as per DOP will issue the safety certificate or he may reissue defect notice may along with the re-inspection fee.
6.	What are all the documents to be submitted in order to obtain Drawing approvals?	➢ Requisition letter from the owner of the installation with details of installation ➢ Duly filled Form A1, Form Z with applicable stamp duty as per Stamp Act, and duly filled Notarised Affidavit-8 on Rs. 20/- stamp paper. ➢ Copies of concerned Electrical Contractor's valid license &

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

Part I

I. Choose the correct answer for the following questions (15 point each)

1. The Procurement team is responsible for

   A. Contacting companies that specialize in auctions and disposal,

   B. negotiating the sale or disposal arrangements

   C. processing the sale

   D. all

2. Disposal channels are available for when equipment reaches the end of its life

   A. true B. false

Note: **Satisfactory rating – 30 points** **Unsatisfactory – below 30 points**

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

Score = _____
Rating: _____

3.1. Informing End Users

End User Documentations

The aim of end user documentation (e.g. manuals and guidebooks for products) is to help the user understand certain aspects of the systems and to provide all the answers in one place. A lot of documentation is available for users to help them understand and properly use a certain product or service. Due to the fact that the information available is usually very vast, inconsistent or ambiguous (e.g., a user manual with hundreds of pages, including guidance on using advanced features), many users suffer from an information overload. Therefore, they become unable to take the right course of action. This needs to be kept in mind when developing products and services and the necessary documentation for them [3].

Well written documentation is needed for a user to reference. Some key aspects of such documentation are;

- Specific titles and subtitles for subsections to aid the reader in finding sections
- Use of videos, annotated screenshots, text and links to help the reader understand how to use the device or program
- Structured provision of information, which goes from the most basic instructions, written in plain language, without specialist jargon or acronyms, progressing to the information that intermediate or advanced users will need (these sections can include jargon and acronyms, but each new term should be defined or spelled out upon its first use)
- Easy to search the help guide, find information and access information
- Clear end results are described to the reader (e.g.,"When the program is installed properly, an icon will appear in the left-hand corner of your screen and the LED will turn on...")
- Detailed, numbered steps, to enable users with a range of proficiency levels (from novice to advanced) to go step-by-step to install, use and troubleshoot the product or service
- Unique Uniform Resource Locator (URLs) so that the user can go to the product website to find additional help and resources.

At times users do not refer to the documentation available to them due to various reasons, ranging from finding the manual too large or due to not understanding the jargon and acronyms it contains. In other cases, the users may find that the manual makes too many assumptions about a user having pre-existing knowledge of computers and software, and thus the directions may "skip over" these initial steps (from the users' point of view). Thus, frustrated user may report false problems because of their inability to understand the software or computer hardware. This in turn causes the company to focus on “perceived” problems instead of focusing on the “actual” problems of the software.

Self-Check 3	Written

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

Part I

I. Write the answer of the following questions

1. Well written documentation is needed for a user to reference. Explain at least six key aspects of such documentation (15)?
2. Write the examples aim of end user documentation to help the user understand certain aspects of the systems and to provide all the answers in one place

Note: **Satisfactory rating – 30 points** **Unsatisfactory - below 30 points**

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

Score = _____

Rating: _____

L #38	LO #2- Plan to Dismantle and Dispose Equipment

Instruction sheet

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

- Preparing Store house
- Dismantling schedule
- Decontaminating equipment

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

- Prepare Store house
- Dismantle schedule
- Decontaminate equipment

Learning Instructions:

Read the specific objectives of this Learning Guide.

1. Follow the instructions described below.

2.Read the information written in the "Information Sheets". Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.

3. Accomplish the "Self-checks" which are placed following all information sheets.

4. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

Information Sheet 1:- Preparing Store house

1.1. Store House

Store house is a house that used to store electrical electronics equipment in the house where the equipment not damage.

Electronic Workbench

Before you get started, make sure your electronic workbench is properly set up. The work area doesn't need to be fancy and you could even build your own electronic workbench.

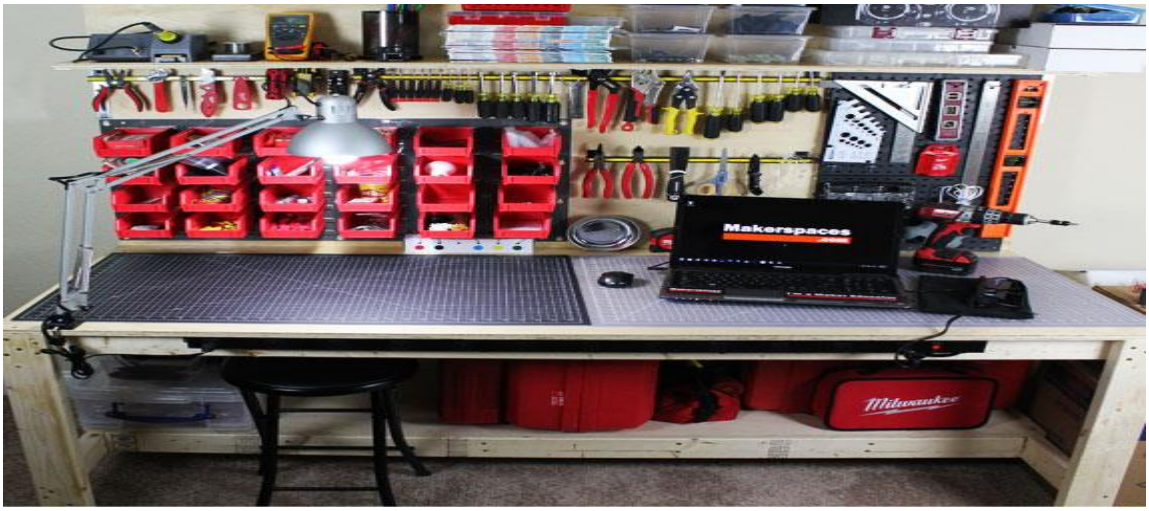

Figure 1.1. Electronics workbench

Storage

Electronic components can be small and it's a good idea to keep everything organized. The most popular option is to use clear plastic storage boxes for storing parts. In addition, you could use plastic storage bins that hang from a rack or fit on a shelf.

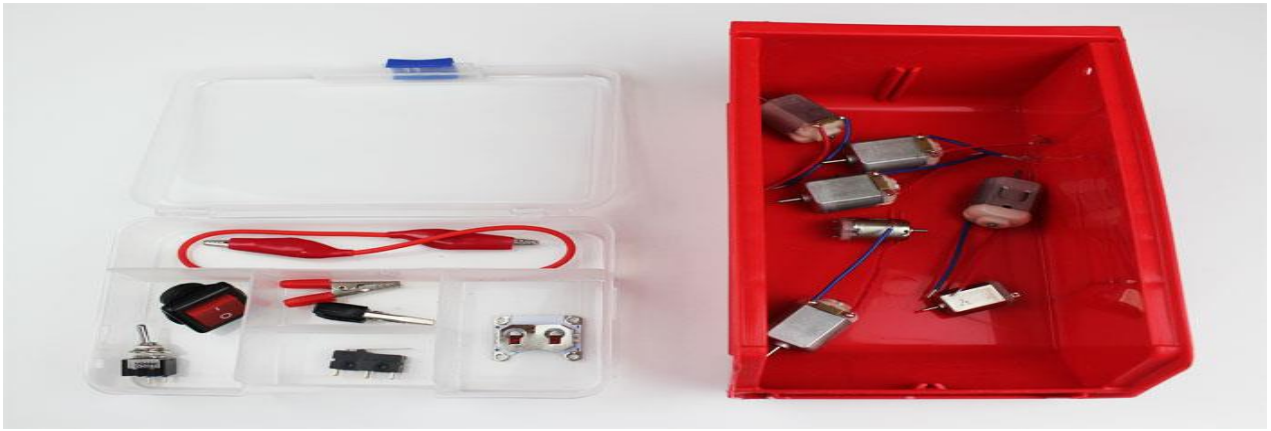

Figure 1.2. Electronics Storage

Tools

Now that you have a good workspace set up, it's time to stock it with the proper tools and equipment. This isn't a complete list but it does highlight the most common items used in electronics.

1.2. Warehouse manager

Receive Electronics shipments in clean receiving by as per receiving SOP (SOP No…..) And check label such as Name, strength, batch number, expiry date according to supplier dispatch document (packing list, sales invoice etc).

- Store products on clean, undamaged pallets and according to product specification.
- Maintain adequate space between the rows of stored products for cleaning, monitoring and inspection.
- Ensure safe and appropriate storage of pharmaceutical products.
- Properly handle and store NPS drugs in compliance with international conventions, and national laws and regulations.
- Store separately highly toxic and radioactive materials, and other hazardous, sensitive and/or dangerous materials and pharmaceutical products in dedicated area that is subject to appropriate additional safety and security measures.
- Follow appropriate stock rotation to ensure that the oldest stock sold first within its shelf life and moved to the front of the picking face and the new stock put to the back.
- Store recalled and returns products according in a dedicated area under key and lock and clearly labeled.
- Periodically segregate and records damaged and expired products.
- Ensure cleanliness of warehouse, monitor as per cleaning schedule and records are maintained
- Control and monitor room temperature and relative humidity using calibrated thermo hygrometer and records are maintained as per the temperature and RH log sheet.
- Check the condition of newly arrived cold box that contain the product.
- Ensure safe and appropriate storage of cold chain pharmaceutical products.

- Check and ensure cold chain products are not placed directly against the refrigerator side or back wall or near the cooling plate.
- Maintained sufficient space around the cold chain products for air to circulate.
- Check the expiry date of the cold-chain products on a regular basis.

Self-Check 3	Written Test

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

Part I

I. Write the answer of the following questions (5 point each)

1. Explain how to prepare electronics store house?

2. Explain checklist of warehouse management?

Part II.

II. Choose the correct answer for the following questions (15 point each)

1. _____ is a house that used to store electrical electronics equipment in the house where the equipment not damage.

   a. Electronic material
   c. Store house
   b. Tools
   d. cold box

Note: **Satisfactory rating – 25points** **Unsatisfactory - below 25 points**

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

Score = _____
Rating: _____

Information sheet 2	Dismantling schedule

2.1. Dismantling Schedule

Dismantling times

- Thursday 1 July: 18:00 – 22:00 (Note: this time is designated only for the removal of audio visual equipment, computers and other valuable items)

- Friday 2 July to Tuesday 6 July: 08:00 - 21:00

Schedule: Thursday 1 July

16:00	The event ends at 16:00. Contractors will not be allowed to access the Venue until 18:00 in order to allow for all visitors to leave the Venue and carpet to be removed from the gangways.
17:00	For safety reasons no trolleys should be used until all visitors have left the buildings. The removal of carpet from the gangways will commence.
18:00	Dismantling begins (and must be completed by 21:00 on Tuesday 6 July)

- For safety reasons, electricity to stands will be cut from 18:00
- No vehicles are allowed to circulate inside the halls. All items must be removed by hand.
- Please ensure that personal and valuable items are removed on Thursday 1 July. The GSMA is not liable for any items left on your stand unattended. (Note: this time is designated only for the removal of audio visual equipment, computers and other valuable items)
- Valuable items can be removed by hand through the venue accesses and from there can be loaded onto vehicles
- Underground parking areas are available around the venue (Parking B,& F max. vehicle height 2.10m), to allow loading of goods
- For external AV companies (not Fira official suppliers) that need to remove equipment on this day, please contact: mwcvehicleaccess@firabarcelona.com
- Stand structures cannot be dismantled on Thursday, July 1. Stand structure dismantling commences on Friday 2 July
- Empty boxes that have been stored with Exhibition Freighting will begin to be distributed. Due to the huge quantity of empty boxes, we cannot guarantee that your

boxes will be delivered to your stand until Friday 2 July. To maintain the security inside the halls the empty boxes will be delivered sequentially

22:00	Venue empty of exhibitors/contractors

NOTE: Resa expo logistic can provide personnel to help exhibitors to remove their valuable equipment. This service will be available from the beginning of dismantling on Thursday 1 July to help exhibitors/contractors move out valuable items for a maximum of 2 hours. you Institute / college. Quotes are available upon request. The supplier is available to help exhibitors/contractor s package their goods and move them to the loading area outside the Venue fence where the goods will finally be shipped out.

Schedule: Friday 2 July to Tuesday 6 July

08:00 - 21.00	(Normal dismantling activity)

2.2. Dismantling Guidelines

- Dismantling: Please note that dismantling wrist bands are the only passes that gain access to the venue from and after Friday 2 July – Exhibitor badges will no longer be valid. The wristbands can be collected from the Exhibitor Service Desks located in the North and South entrances of the venue [4].

- Hard hats and high visibility clothing: The use of this equipment is compulsory within the entire Venue during the dismantling period as it was for build-up and will be required to gain access at all entry points. Should you require any of the above mentioned items, they can be purchased at the South entrance (only during the official dismantling period), however it is recommended that contractors bring their own safety equipment where possible
- end of exhibition dismantling: must be completed by Tuesday 6 July at 21:00
- Shell scheme & other package stands: (Shell Scheme, Exhibition Stand Plus, Meeting Rooms, Executive Meeting Rooms, Business Meeting Rooms, China Pavilion, Pods): all items must be removed by Thursday 1 July at 22:00. All these packages will be dismantled on Friday 2 July. Those items not removed on Thursday 1 July will be destroyed

- Stands spaces must be clear: Exhibitors/Contractors must leave the space in which they have built their stand clean and clear at the end of the dismantling period. This includes any carpet tape stuck to the hall floor. At the end of dismantling, contractors must have their stand space inspected by a representative of the official Waste patrol team who will issue a waste removal "Handover Certificate". The waste patrol team will be contactable through the hall manager of the hall your stand is located in. All exhibitors without a Handover Certificate may be subject to extra penalty charges by GSMA in accordance with the waste removal penalties detailed in the online event manual.

Self-Check 2	Written Test

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

Part I

I. Write the answer of the following questions (10 point each)

1. List and Explain Dismantling guidelines?

2. Discuss and do dismantling schedule for your program?

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

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

Score = _____

Rating: _____

Information sheet 3	Decontaminating Equipment

3.1. Introductions

The decontamination must guarantee the elimination of the Polluting Agent, either through the physical removal of the surface or through the chemical destruction of the Polluting Agent (also known as detoxification). Most Decontaminating Agents act by chemical destruction of the contaminating agent, generally using water-based decontaminating agents, in which water is used as a medium to support oxidizing and/or nucleophilic chemical compounds. These are as a rule

very effective, but precisely because of their aggressive chemical nature they are not compatible with sensitive materials.

Most water-based decontaminating agents are chlorine derivatives and hydrogen peroxide: Sodium Hypochlorite, Calcium Hypochlorite, Sodium Trichloroisocyanurate, Hydrogen Peroxide, Per-acetic Acid, etc.

The effectiveness of these decontaminants is based on the aggressive nature of these compounds, due to this nature, not only affect pollutants, but also materials such as some metals.

The components of the electronic equipment, as well as the circuit boards on which they are installed, as a rule are constituted for the most part by metals such as copper, aluminum and / or their alloys. In the event that these metals come into contact with corrosive and / or oxidizing substances such as water-based decontaminants, they can corrode / oxidize, negatively affecting their functionality.

At present, the international consensus on decontamination systems based on Water Based technologies is almost unanimous. The decontamination protocols of vehicles, people, land and non-electronic materials contaminated by both chemical warfare agents (CWAs) and toxic industrial products (TICs) have demonstrated their undeniable effectiveness [5].

3.2. Decontamination of electronic equipment

Considering the aforementioned premises, the optimal solution for decontaminating electronic equipment without damaging its functionality, consists of combining the physical removal with a non-aqueous (organic) and volatile solvent base.

The decontaminating agent RD50 develops a decontamination based on Adsorption on chemically modified silicas. and in a non-aqueous medium of dispersion of the adsorbing agent.

On the one hand, silicas provide a high capacity for adsorption and retention of complex organic compounds, and on the other hand, the solvent base presents a mixture of polar and non-polar agents, volatile, dielectric, non-conductive and non-corrosive that guarantees the dissolution of chemical warfare agents (CWAs) and a null corrosive effect on the material to be decontaminated (electronic equipment or sensitive material).

Decontaminating Agent RD50 Operation

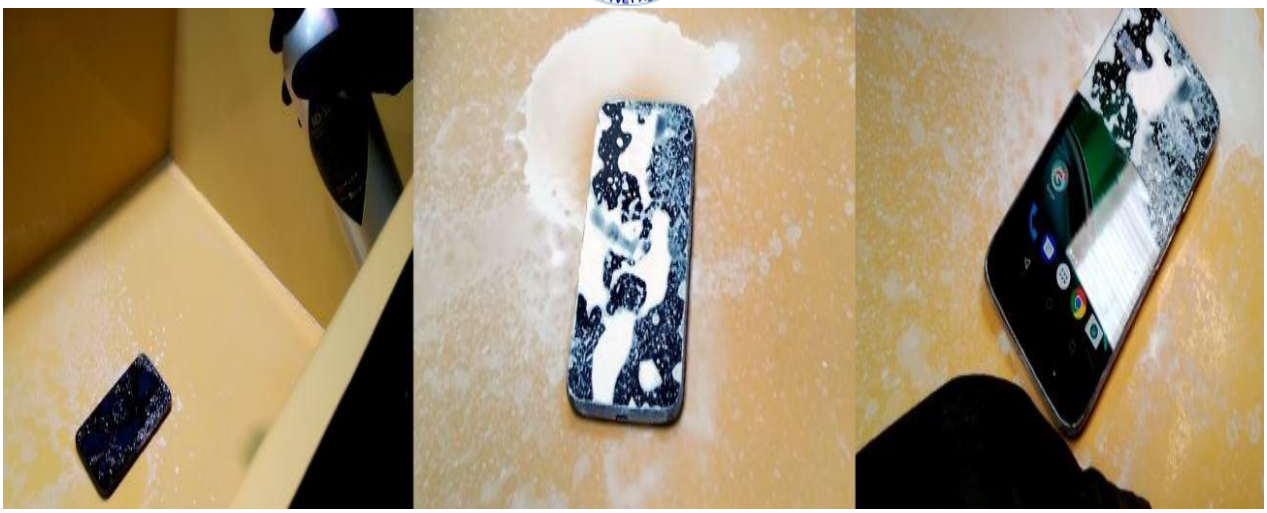

Figure 3.1. Decontaminating Agent RD50

Application of the decontaminating agent RD50 for the decontamination of chemical agents (CWAs or TICs) is proposed in a 3-phase process:

- Application of Decontaminating Agent on contaminated equipment
- Decontamination Time
- Elimination of Decon Mixture (mixture resulting from the decontaminating agent and the chemical agent adsorbed

3.3. Laboratory Testing of Decontamination

1. Swipe testing the inner and outer surfaces of Chemical Protective Clothing can be wiped with cloth or paper patches called "swipes" and then sent to a laboratory for analysis. Swipe tests can also be done on the skin.

2. Permeation Analysis To find out if the contaminants have permeated your CPC, a small piece of the clothing can be sent to a lab for analysis.

3. Analysis of Cleaning Solution The final decontamination rinse can be sent to a lab for analysis to find out, the amount of toxic chemicals it contains.

There are two basic methods of decontamination:

1. Use washes, rinses, scrubbing to physically remove the contaminants.

2. Use chemicals to neutralize or inactivate the contaminants.

How decontamination is carried out and how thorough it needs to be depends upon several factors. The most important factor is the contaminant itself. The more harmful the contaminant

the more thorough decontamination must be, And even very small amounts of some contaminants can be harmful. If the chemical is destructive to the skin, decontamination must be as complete as possible. Other factors to consider when deciding how to decontaminate include: o Amount of Contamination. If you can see the contamination on your clothing or equipment, you need to be thoroughly decontaminated. But remember that not all contamination can be seen! o Concentration of the Contaminant. The higher the concentration of the hazardous substance, the more likely it is that your PPE has become contaminated. Remember, high concentrations of chemicals are also more likely to have seeped into or through your chemical protective clothing. o Level of Protection Worn. Decontamination procedures will vary according to the protective clothing and equipment used. For example, the straps and backpack of a Self-Contained Breathing Apparatus may require decontamination. (To avoid having to decontaminate your SCBA wear a butyl rubber apron over it). o Location of the Contamination. Contamination of the upper part of your Chemical Protective Clothing (CPC) can also contaminate your breathing zone and the breathing zone of the decontamination workers helping you. 2 Skin contact with contaminated CPC is also more likely if the contamination is on the upper part of the CPC. HOW **can you tell if the decontamination worked?**

You can't. At least not immediately. Sometimes you will be able to tell by inspecting your protective clothing and equipment for stains, discolorations, swelling, stiffness or corrosive effects. Always remember to do this before you put on your suit [6].

There are, however, two problems with looking for visible effects:

1. Many chemicals do not leave visible traces
2. Visible traces only tell you about surface contamination. They can't tell you if the chemicals have been absorbed or permeated.

Self-Check 3	Written Test

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

Part I

I. Write the answer of the following questions

1. What are contaminations (3)?

2. Discuss Laboratory testing of contaminations (5)?

3. Discuss the two basic methods of contaminations (4)?

4. Explain decontaminations of Electronic equipments (8)?

Part II.

II. Choose the correct answer for the following questions (5 point each)

1. From the following choose which one are basic methods of decontamination**:**

a. Use washes, rinses, scrubbing to physically remove the contaminants.

b. Use chemicals to neutralize or inactivate the contaminants.

c. a and b

d. None

2. _____To find out if the contaminants have permeated your CPC, a small piece of the clothing can be sent to a lab for analysis.

a. Permeation Analysis c. none

b. chemicals to neutralize

Note: **Satisfactory rating – 30 points** **Unsatisfactory - below 30 points**

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

Score = _____

Rating: _____

L #39 LO #3- Organize resources needed

Instruction sheet

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

- Organizing and finalizing Work
- Financial resources
- Preparing materials, tools and equipment

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

- Organize and finalizing Work
- Financial resources

- Prepare materials, tools and equipment

Learning Instructions:

Read the specific objectives of this Learning Guide.

1. Follow the instructions described below.

2.Read the information written in the "Information Sheets". Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.

3. Accomplish the "Self-checks" which are placed following all information sheets.

4. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

Information sheet 1 Organizing and finalizing Work

1.1. Organizing and Finalizing Work

How To Be Organized and finalized At Work

- **Use An App**

Apps are enormously useful in helping you get organized at work. Just don't start using too many. Choose one cloud-based calendar or project-management app and use it to keep yourself on track and on task.

- **Avoid Multitasking**

It may seem counterintuitive, but you actually get less done when you multitask. First, your attention is divided, so you're not putting 100 percent into the work. Second, it takes longer to complete both tasks together than it does to bring one task to completion and then work on the other.

- **Stay On Top Of Your Inbox**

With all the work you're doing on the latest task or project, it's very easy to neglect your email inbox. Resist the urge to put this off until later. Create folders for work, personal, and other types of messages.

Then take a few minutes at the beginning, middle, and end of the day to delete the junk and file the rest. Your goal should be inbox zero.

- **Make A Weekly Plan**

At the end of your work week, set aside 15 minutes (or more if necessary) to plan your next Monday through FridayYou don't have to be specific (that's what step five is for); just aim to write down at least one task for the morning and afternoon of each day.

- **Make A Daily Plan**

At the beginning of each workday, plan the specific activities you hope to accomplish. You know you're going to work on the budget Monday morning (you planned it in step four), so set some goals for small pieces of that project you want to complete.

Do the same for the afternoon. Then get to work.

- **Take Breaks**

It takes energy to stay organized. To keep your energy level high, schedule in short breaks throughout the day. This will allow you to stay fueled and hydrated (fed and watered, if you will) and also help you recharge your batteries during difficult tasks.

Even just five minutes away from your desk can improve your focus.

- **Silence Your Phone**

There's nothing more distracting than your phone blowing up every thirty seconds with news from every person in your contacts list. Take control of this nuisance during your workday by silencing your ringer and turning off notifications.

You can even try putting your phone in a drawer if you find yourself constantly curious about what's going on in the Twitter world.

- **Purge Your Supplies**

Office supplies are a necessary part of your workday. But too many office supplies actually hinder productivity. They clutter up your desk and make you feel like you have no room to spread out and work.

One of the first steps in staying organized at work is to sort through all of your office supplies and get rid of (throw away or donate) the items you don't use on a regular basis.

- **Put Everything In Its Place**

Once you've got your office supplies sorted and down to just the necessary items, it's time to find a place for everything.

Once you do this, make a very real effort to return items you've used to their home location periodically throughout the day and before you leave in the evening. That way, your desk and office environment will be organized when you return in the morning.

- **Go Paperless**

Paper takes up a significant amount of space. Drawers, folders, filing cabinets, and closets are filled with it. And it takes serious effort to keep all that paper organized and accessible.

You can reclaim huge blocks of time — and keep your work area organized in the process — by going paperless whenever possible.

- **Unsubscribe**

One sure-fire way to add a little organization to your work life is to unsubscribe to all the emails that make it through your spam filter.

Take a few seconds to unsubscribe as the emails roll in. Then delete the messages for good and pat yourself on the back for taking another small step toward total organization.

- **Consolidate The Places You Go For Information**

If you need to use a number of apps for work, try to consolidate them so that you receive notifications in one place instead of three or four. When you can see everything pop up on your

computer monitor (for example), you can quickly decide what's important and what you can leave until later.

- **Talk More**

Believe it or not, talking more can help you stay organized. Instead of emailing, use the phone, a chat app, or just walk down the hall. Doing so reduces the number of emails you receive and eliminates the time you waste responding to the endless email threads.

- **Set Aside Time For Organization**

It's also a good idea to schedule organization breaks into your day. Pause your work for five minutes, set a five-minute timer, then file stray papers, put away supplies, and generally tidy up your area.

Once the five minutes are up, get back to work. You'll feel better and be motivated to continue staying organized.

- **Keep Your Desk Clean**

Your desk is your primary workspace and should be kept clutter-free. If you've already tackled step nine (a place for everything), keeping your desk clean won't be such a chore.

Return post-its and paperclips to their drawer and file unneeded papers in the filing cabinet. At the very least, tidy your desk before you leave the office so you don't have to do it in the morning when you're ready to work.

- **Divide Your Desk Into Specific Zones**

When you divide your desk into specific zones, you can make headway toward understanding how to be organized at work.

Other than your chair, you're likely to use your work surface the most throughout your day. So it's essential that you keep this space as orderly as possible.

We've already mentioned several ways you can keep your desk neat and tidy — purge supplies, put everything in its place, go paperless — but this tip provides the structure that makes those other suggestions work.

To start, divide your desk into front and back (i.e., closest to your and farthest from you). If you're having trouble visualizing, purchase a small roll of blue painter's tape and lay a strip right down the middle of your desk from left to right.

Next, divide the length of the desk into three equal sections from front to back. If you think you'll need more space in the center, you can make it wider and the side sections narrower [7].

Self-Check 1	Written Test

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

I. Write the answer of the following questions

1. How to Be Organized and finalized At Work (15)?

Note: **Satisfactory rating –15 points** **Unsatisfactory - below 15points**

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

Score = _____

Rating: _____

Information sheet 2: Financial Resources

2.1. Financial Resource

Financial resources are a term covering all financial funds of the organization. From an economic perspective financial resources are the part of the organization's assets (property). Sometimes

financial resources are referred just as Finance, often with some attributes (such as Business finance, Personal finance, Public finance).

Finance is one type of resource, respectively, that inputs into the production process.

How financial resources are structured?

In terms of finance control, financial resources are structured as follows:

- Business funds - cash, deposits with financial institutions and cash equivalents (securities, checks …)
- Corporate capital - the sum of all money invested in the organization's total assets (equity capital + liability (foreign capital)
- Other financial resources - resources of funds creation and corporate capital (flow variable - the sum of "inflow" of money into the company for a certain period)

Financial resources are needed to acquire appropriate equipment, services, and supplies that are needed in order to implement the program (e.g. personnel monitoring devices, equipment repair/calibration); additionally, there are licensing and inspection fees.

Continuing education is an essential component of radiation safety programs; it involves financial expenditures which must be included in the overall budget. The RSO should be provided financial and time resources to attend professional conferences and courses, and to purchase and/or develop educational materials. Whenever a new procedure is introduced, the RSO must develop specific radiation safety procedures and provide introductory training and retraining for involved staff.

Self-Check 2: Written Test

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

Part I

I. Write the answer of the following questions

1. What is financial resource (5)?

2. How financial resources are structured (10)?

Note: **Satisfactory rating – 15 points** **Unsatisfactory - below 15 points**

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

Score = _____
Rating: _____

Information Sheet 3: Preparing Materials, Tools and Equipment

3.1. Preparing Tools, Material and Equipment

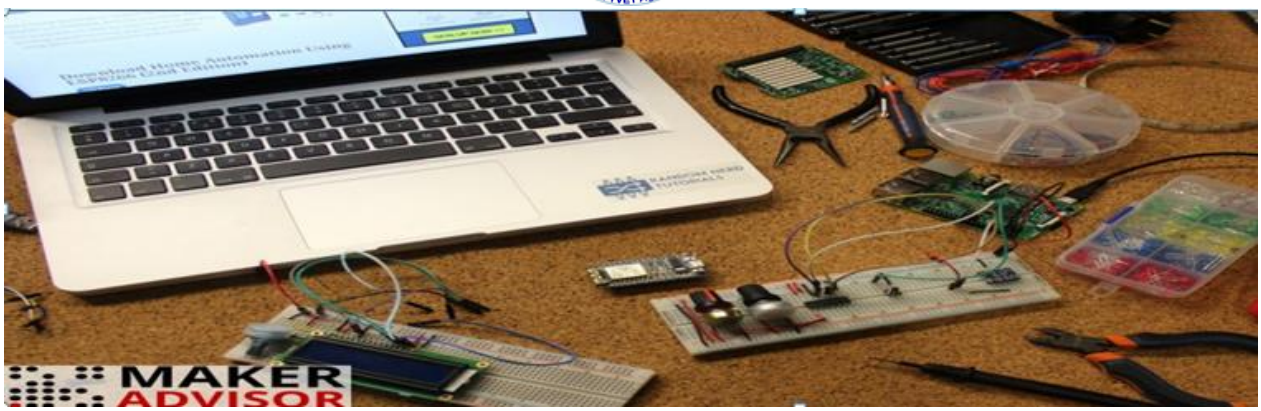

Figure 3.1. Electronic Tools, Equipment and material

If you've decided to start learning electronics and you're looking to set up your own hobbyist electronics lab, you're in the right place. This guide will help you learn how to set up an electronics lab and find the right tools and equipment.

3.2. Setting Up an Electronics Lab

When you're just getting started, it is difficult to know what tools are or aren't essential, or what are the best tools.

This list contains a lot of different tools. You don't need to buy them all at once. Otherwise, you'll end up buying stuff that you don't need or stuff you'll never use! Start by purchasing a few essential tools related to the projects you want to do. Then, as your lab, and your expertise starts growing, upgrade you lab with new tools.

3.3. Finding the Right Spot

Making electronics projects is a lot of fun and it is nice to have a specific space to be our lab, a space where we have all we need to make our projects. It doesn't have to be a full room or a big space. But it's important to have "the" space! A space that is ours and where we can have all things we need to get the most of making electronics projects.

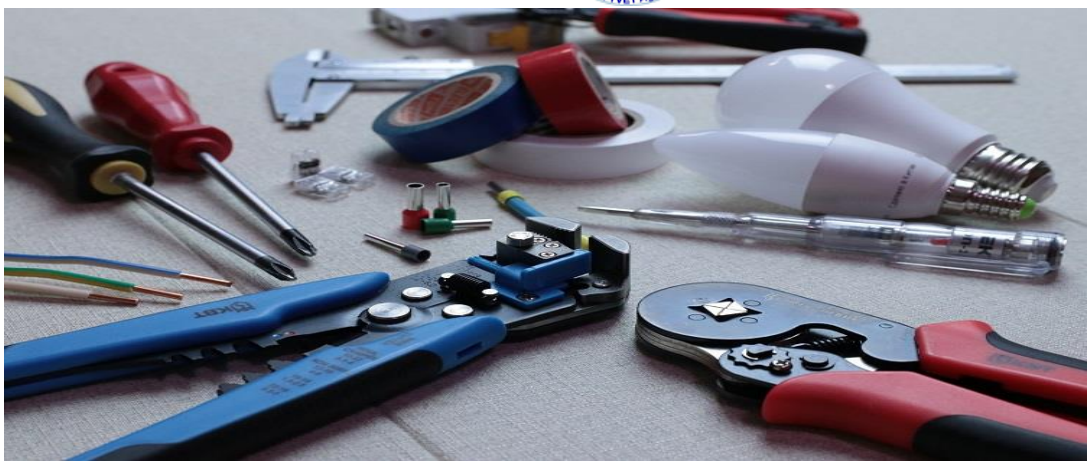

Figure 3.2. Basic Hand tools

Once you have your spot, you need to set it up! We'll show you some essential tools to set up your own electronics lab.

Multimeter

A multimeter is a measurement tool absolutely necessary. It helps you troubleshooting your circuits. Sometimes your circuits may not work because of faulty wires. Checking the connections with the millimeter can save a lot of time.

If you're looking for one, we truly recommend an auto-range multimeter. The auto-ranging is a great advantage, because it saves you of the hassle of having to guess which range of value the electrical characteristic you're measuring falls under.

Figure 3.3. Millimeter

Soldering Station

Having a soldering station in an electronics lab is absolutely necessary, even if you don't usually build permanent circuits. Many electronics components don't come with header pins or breadboard-friendly pins attached. In these cases, you'll need to do some soldering work. If you don't do a lot of soldering, a simple soldering station will do the job. However, we really recommend getting a good soldering station with enough wattage and adjustable temperature. A good soldering station will last your entire life.

If you're looking for a soldering station, you may be interested in reading our suggestions about the best soldering irons for beginners and electronics hobbyists.

Figure 3.4. Sucker

If you are limited in terms of space, you may want to get a small portable soldering iron. We really recommend the TS80 mini portable soldering iron. It is as good as a regular soldering iron and occupies very little space. Read our review: TS100 Soldering Iron Review – Best Portable Soldering Iron.

Soldering Accessories

Besides the soldering station you also need some soldering accessories:

- Solder: the easiest type to work with is 60/40 lead/tin.
- Solder wick: the wick soaks up molten solder, it's useful to clean the excess of solder.
- Cleaning sponge: to clean the tip of your iron while soldering.
- Tip thinner: used to clean the tip of the soldering iron.
- Diagonal cutting pliers: useful to trim the leads after soldering.
- Helping hand: to hold your components together while you solder.

- Flux pen: the flux pen content aids the flowing of a lead-free solder.
- Solder vacuum pump: this tool helps you removing the solder left when desoldering components.

For more soldering accessories, take a look at the Top 10 Soldering Accessories and Tools.

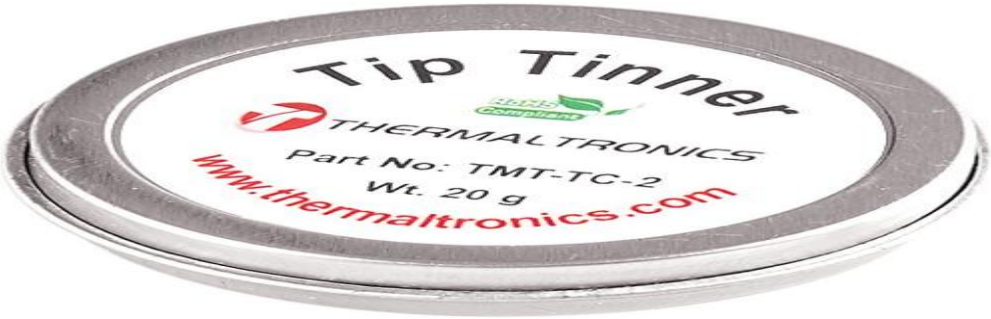

Figure 3.5. Tip Thinner

Bench Power Supply

A voltage supply may not be essential in simple and beginner projects, but it is a really practical tool when it comes to circuits. It allows you to power your circuits before they are finished, to test individual circuits, to experiment, etc. Nowadays, simple bench DC power supplies aren't that expensive anymore. In fact, you can get one for less than $100. Read the best bench power supply for electronics hobbyists buying guide.

Figure 3.6. Electronics power supply

Oscilloscope

An oscilloscope is a great tool for debugging and better understand what is going on with your circuits. Unlike a millimeter that only shows the voltage at a specific moment, with an oscilloscope you can see what's happening with the voltage over time.

Figure 3.7. Hantek DSO5102P Digital Storage Oscilloscope 2Channels 100MHz 1GSa/s

Oscilloscopes are expensive. A cheap regular bench oscilloscope costs at around $300. However, there are very cheap oscilloscope kits that can perform the most basic functions for a very low price.

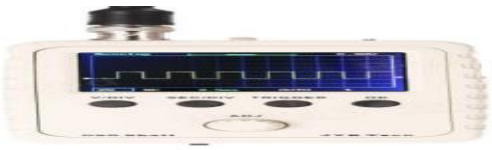

Figure 3.8. Original JYE Tech Assembled DSO-SHELL DSO150 Oscilloscope

Wire Stripper

A wire stripper is essential in an electronics lab as you'll have to strip cables many times. You can get a simple wire stripper, but we absolutely recommend you a self-adjusting wire stripper/cutter instead. It is very easy to use, adapts to a wide variety of cables and works perfectly.

Needle-nose Pliers and Wire Cutter

A needle-nose pliers is always handy. You should absolutely get one. Wire cutters are also absolutely essential.

Figure 3.9. Needle-nose Pliers and Wire Cutter

Hot Glue Gun

Hot glue is great. It is very handy for a wide variety of applications if you want to make something stick together. In electronics, hot glue is perfect to fix your circuit into a surface or to attach cables together. As the glue is an insulating material, it can help you protect your circuitry. Check our post about hot glue guns: best hot glue guns – our budget and top picks.

Figure 3.10. Hot Glue Gun

Precision Screwdriver Set

There are components with really small screws and with specific shapes and so, at some point in your projects, you'll need a precision screwdriver. We recommend you getting a set take comes with extension bits because you'll need all of them sooner or later. Take a look at best precision screwdriver sets – our budget and top picks.

Figure 3.11. Precision Screw Driver

Tweezers

Tweezers are very useful to manipulate the small electronics components. The tweezers below have an extremely small and pointed tip, which is perfect for electronics.

Figure 3.12. Tweezers

Rotary Tool and Accessories

A rotary tool is great if you like to give your projects a good finished look. This tool is good for working with acrylic, plastic, wood, and more. This tool is not essential for your lab, but it can be very useful.

Figure 3.13. Rotary Tool and Accessories

3D Printer

A 3D printer is not an essential tools in an electronics lab, but it is very useful. With a 3D printer you can take your projects to the next level by building personalized box enclosures, robot parts, and much more. There is a wide variety of 3D printers for all sorts of budgets.

We have a Creality 3D CR-10 3D printer and we're really happy with its performance – you can read our review about the Creality CR-10 3D printer.

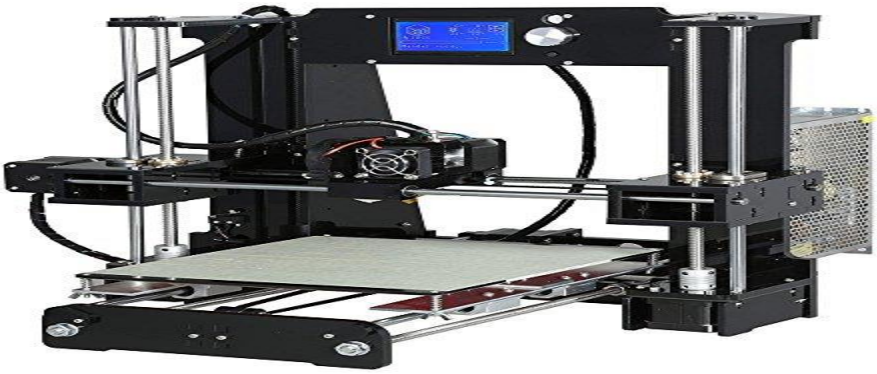

Figure 3.14. Assortment Kits and Electronics Components

Besides the previous tools, you need some electronics components to get started. It is easier and cheaper to get started with assortment kits. Here's some of the assortments kits we recommend:

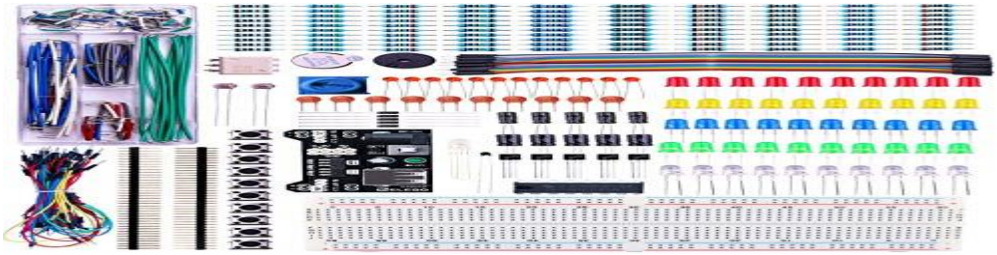

Figure 3.14. Elegoo EL-CK-003 Upgraded Electronics Fun Kit

Figure 3.15. XL Electronic Component Kit Assortment

Breadboards

Breadboard are a must for prototyping and testing your circuitry. Once you start doing electronics projects, you'll realize that you'll never have enough breadboards for your projects. Check the breadboard options in our Tools page. There are also breadboard kits that come with other useful accessories for the breadboard.

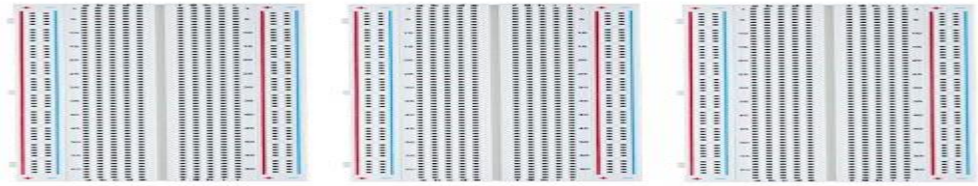

Figure 3.16. Elegoo 3pcs MB-102 Breadboard 830 Point

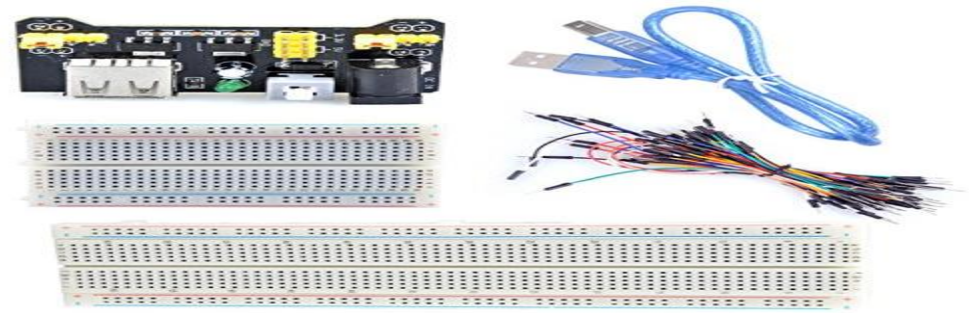

Figure 3.17. Breadboard Kit

Jumper Wires

Jumper wires are really handy to connect components together. We recommend getting female to female, male to female, and male to male jumper wires.

Figure 3.18. 120pcs Multicolored Dupont Wire Kit 40pin Male to Female, 40pin Male to Male, 40pin Female to..

Figure 3.19. Remington Industries Solid Hook-Up Wire Kit, 300V, 0.0253" Diameter, 25' Length

Resistors

You'll need resistors in most of your electronics projects. Get a 1/4 watt resistors assortment.

LEDs are awesome and are always a good fit in all electronics projects. Get an assortment with several colors and sizes.

Figure 3.20.Elegoo 3mm and 5mm Diffused and Clear Assorted LED Kit 5 Colors with UV, RGB CA, (Pack of 350)

Potentiometers and Pushbuttons

Potentiometers and pushbuttons are a must. You'll use them often.

Figure 3.21. 200 Pcs Tactile Push Button Switch Micro Momentary Tact Assortment Kit

Figure 3.22. WGCD 18 Knurled Shaft Linear Rotary Taper Potentiometer with Cap Kit (18 PCS)

Other Electronics Components

It can also be useful getting kits with transistors, diodes, and capacitors.

Figure 3.23. Electronics-Salon 0.47uF to 1000uF Electrolytic Capacitors Assortment Kit, 13 Values, Total 200...

Figure 3.24. Hilitchi 24-Values 2N2222-S9018 / BC327-BC558 NPN PNP Power General Purpose Transistors...

Figure 3.25. Ltvystore 100PCS 10Value (1N4001~1N5819) Diode Assorted Kit Set with Clear Box

Figure 3.26. 10pF to 100nF 15Values Ceramic Capacitor Set, Hilitchi 525Pcs DIP Monolithic Multilayer Ceramic...

Varied Sensors and Modules

There are a wide variety of sensors and modules compatible with Arduino and other development boards. You can get some of them for a very reasonable price. Check the all the sensors options at our tools page.

Figure 3.27. Elegoo Upgraded 37 in 1 Sensor Modules Kit with Tutorial for Arduino

Arduino Starter Kit

An Arduino Starter Kit is the easiest way to start with digital electronics and programming. We have a full post dedicated to Arduino Starter Kits that you can read here.

Figure 3.28. Elegoo EL-KIT-001 UNO R3 Project Complete Starter Kit with Tutorial for Arduino (63 Items).

Figure 3.29.ARDUINO The Starter Kit

Cabinet organizer

A cabinet organizer is essential so that you have all your components organized. We've put together a list with the Best Storage Organizers For Electronic Components and Parts.

Figure 3.30. Akro-Mils 10164 64 Drawer Plastic Parts Storage Hardware and Craft Cabinet

Maker Advisor Tools Page

You may also find useful taking a look at our Tools page here. We share the components and tools we use more often, and compare the price on different stores, so that you can get the best price.

Self Check 1	Written Test

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

Part I

I. Write the answer of the following questions

1. Explain how and what tools, Equipment, and material prepare for your shop (10)?

Part II.

II**.** Choose the correct answer for the following questions (5 point each)

1. _____is the easiest way to start with digital electronics and programming.
   a. Arduino Starter Kit
   b. Cabinet organizer
   c. Varied Sensors
   d. all
2. _____are really handy to connect components together.
   a. Jumper wires
   b. Resistor
   c. capacitor
   d. capacitor

Note: **Satisfactory rating – 20 points** **Unsatisfactory - below 20 points**

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

Score = _____

Rating: _____

L #40	LO #4- Dismantle the Equipment

Instruction sheet

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

- Dismantling the equipment
- Marking and labeling parts
- Cleaning , checking, and make ready Dismantled parts
- Identifying reuse and disposal Parts
- Identifying disposed Items

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

- Dismantle the equipment
- Mark and labeling parts
- Clean , checking, and make ready Dismantled parts
- Identify reuse and disposal Parts
- Identify disposed Items

Learning Instructions:

Read the specific objectives of this Learning Guide.
1. Follow the instructions described below.
2. Read the information written in the "Information Sheets". Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
3. Accomplish the "Self-checks" which are placed following all information sheets.
4. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
5. If you earned a satisfactory evaluation proceed to "Operation sheets
6. Perform "the Learning activity performance test" which is placed following "Operation sheets"
7. If your performance is satisfactory proceed to the next learning guide,
8. If your performance is unsatisfactory, see your trainer for further instructions or go back to "Operation sheets".

Information sheet 1 Dismantling the equipment

1.1. Procedure for Dismantling Waste Electrical and Electronic Equipment (WEEE)

This procedure describes the process for dismantling branded electronic/electrical products manufactured and/or sold within the EU in compliance with WEEE requirements. The dismantling instructions are intended for use as guidelines by dismantlers or recyclers when processing end-of-life products. Ensures equipment is properly labeled and disposed of in line with the WEEE requirements. Dismantlers / Recyclers: Strips products damaged or beyond useful life into material types providing savings on landfill weight and costs [8].

Equipment

The list below represents general and specialty tools used in the dismantling of Smith & Nephew Endoscopy products.

- Phillips and flat screwdrivers
- Pliers and wire cutters
- Oval head cutter
- 3/16-inch nut driver
- 1/4-inch Hex nut driver
- Allen wrenches
- TR 10 x 50 tamper-resistant Torx driver (WIHA 7045)
- Wrench, 10 mm open end

Procedure

NOTE: Please follow the general safety and personal protection precautions in your facility when dismantling WEEE. Dismantling consists of several subassembly groups for numerous Smith & Nephew Endoscopy products. Please follow the instructions listed below. Individual waste containers should be labeled and used accordingly.

Table 1.1. List of material that list for dismantling

Metals	Electronics	Other
Aluminum	PC boards	Heat shrink tubing
Stainless steel	Cable assemblies	Foil tape
Plain steel w/ plating	Computer drives	Rubber feet
Copper	Fans and connectors	BG39 glass
Brass	Switches & membranes	BK7 glass
Carbon steel	AC receptacle	Charcoal foam
Titanium	Electric valves	Lamps
	AC power switch	Glass
	Stranded wire	
	Coaxial wire	
	RF filter	
	Speaker	
	Power supply	

Removal of Cover

Remove the main cover by taking out the screws in the back of the unit. Place the hardware and cover in the metals waste container.

Removal of Cable Assemblies and Wiring

Cut all the tie wraps that are securing the cable assemblies. Place them in the plastics waste container. Remove cable assemblies and wires by disconnecting them or cutting the leads flush with the connectors. Place the cables in the electronics waste container. Place the connectors in the plastics waste container.

Exception: There are some cable assemblies that have metal connectors (VGA, USB, etc.). Place these connectors in the metals waste container after removing them from the cable assembly.

Note: Access to some cable assemblies can only be achieved by removing components above or around them during the dismantling process.

Where feasible, cable assemblies with ferrite beads attached should have the ferrite removed from the cable assembly and placed in the metals waste container. Some cable assemblies are an integral part of an electronic component and cannot be removed by dismantling. Discard the component with cable assembly attached in the appropriate waste container.

Dismantling of Rear Panel

Remove all electrical type components such as the fan, switch, and AC receptacle and place them in the electronics waste container. Other components such as the metal fan shields and connectors can be placed in the metals waste container. Place all plastic components such as plastic fan shields in the plastic waste container. The handle (if applicable) and equipot may be left assembled to the chassis or removed and placed in the metals waste container. The rear overlay is attached by a PSA adhesive and can only be removed with solvent. It is recommended that the rear overlay remain attached to the chassis.

Dismantling of Front Panel

Dismantle the bezel assembly by removing the fasteners from the chassis, Place the fasteners in the metals waste container. If any cable assemblies or PC boards or switches are mounted to the bezel, remove and place them in the electronics waste container. If the unit consist of any knobs dispose of them in the appropriate waste container. Front panels containing a front overlay are most likely attached by a PSA adhesive and can only be removed with solvent. It is recommended that the front overlay remain attached to the bezel. The bezel is an injection molded plastic and should be placed in the plastics waste container.

Removal of PC Boards

The PC boards (PCB's) are typically secured by fasteners and, in some cases, are in a stacked assembly in the unit. Remove the fasteners and place them in the metals waste container or plastics waste container according to the fastener material, remove the PCB's and place them in the electronics waste container. PCB's can consist of sheet metal brackets used for mounting or there may be metal stand offs used. As they are encountered and disassembled place them in the

metals waste container. Continue the dismantling process from the top down until all PCB's, fasteners, and shielding are removed and discarded as indicated.

Dismantling of other components (not previously mentioned)

After the dismantling of the front and rear panels along with the removal of all cable assemblies and PC boards, there can be several miscellaneous components remaining that have not been specifically mentioned for removal. These components can consist of the following items at a minimum:

- Power Supplies
- Keyboards
- Displays
- Hard Drives
- Motors
- Lamp Assemblies
- Speakers

Remove all remaining items and place them in the appropriate waste container. Place the fasteners in the metals waste container.

Dismantling of Chassis

At this point in the process there should only be the chassis with very few components remaining. Check the bottom of the chassis for possible mounting feet. Chassis feet are typically plastic or rubber and attached by fasteners or adhesive. Remove the fasteners if applicable and place them in the metals waste container and place the feet in the plastics or other materials waste container accordingly. Remove any remaining non-metal items such as plastic wire ducts and dispose in the appropriate waste container. The chassis should now be free of all components. Place it in the metals waste container.

Self Check 2	Written Test

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

Part I

I. Write the answer of the following questions

1. List the equipment used for dismantling Electrical electronics product (5points)?
2. Explain the procedures of dismantling electrical electronics equipment (5points)?

Part II.

II**.** Choose the correct answer for the following questions (10 point each)

1. From the list below which is represents general and specialty tools used in the dismantling of Smith & Nephew Endoscopy products.

a. Phillips and flat screwdrivers
b. Pliers and wire cutters
c. Oval head cutter
d. All

Note: **Satisfactory rating – 20 points** **Unsatisfactory - below 20 points**

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

Score = _____
Rating: _____

Operation Sheet 1	LO4: Dismantling Equipment

Operation Title: - Dismantle Electronics equipment using Dismantle procedure

PURPOSE: -

- The trainee's will be able to keep the procedures.
- The trainee's will be able to perform Dismantling of equipments.

Conditions or situations for operation: - Have a clean workspace with all necessary tools and equipment.

Equipment, Tools & Materials: - Disposal room, Glove, Eye glass, safety foot and body wears.

Procedure: - Dismantle Electronics equipment using Dismantle procedure

Step 1: Removal of Cover

Step 2: Removal of Cable Assemblies and Wiring

Step 3: Dismantling of Rear Panel

Step 4: Dismantling of Front Panel

Step 5: Removal of PC Boards

Step 6: Dismantling of Chassis

Precautions:-

- Take ESD precautions.
- Document everything.
- Power off all devices and disconnect them from the main power supply.

Quality Criteria:-

- The trainee's use safety for documents &components.
- The trainee's make Dispose Electronics equipment using disposal procedure.

LAP TEST #1	Practical Demonstration

Name: _____ Date: _____

Time started: _____Time finished: _____

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

1. How to Dismantle electronics equipments?
2. From General safety precautions show the antistatic:
   - ✓ Electrostatic wrist strip
   - ✓ Antistatic mat
   - ✓ Antistatic box

➢ *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 2	**Marking and labeling parts**

2.1. List of interesting facts about CE (Europeans conformity of Electrical electronics product) marking:

- The CE mark, or formerly EC mark, is a mandatory conformity marking for certain products sold within the European Economic Area (EEA) since 1985
- CE stands for Conformité Européenne (French), which means European conformity
- CE marking is a self-declaration where a manufacturer proves compliance with EU health, safety and environmental protection legislation and confirms a product's compliance with relevant requirements
- With a CE mark, your product can be sold in the EU and in Iceland, Liechtenstein, and Norway
- There are six steps to CE marking:

  ✓ Identify the relevant directives and standards,
  ✓ Verify the product's specific requirements,
  ✓ Identify whether an independent conformity assessment (Notified Body) is necessary,
  ✓ Test product,
  ✓ Create technical documentation, and
  ✓ Add CE mark to the product

- CE marking is not evidence of compliance – your technical documentation/technical file is
- The manufacturer or authorized representative must keep technical documentation for a number of years (the number is dependent on the product type) after the last product has been placed on the market
- Each EU country is responsible to enforce CE marking, by banning products and levying fines for non-compliance
- Unsafe products are shared in the EU via RAPEX – a rapid alert system on measures taken to prevent or restrict the marketing or use of products posing a serious risk to the health and safety of consumers
- There is a very similar logo where the CE stands for Chinese Export or China Export – this has nothing to do with European conformity
- The size of the CE mark must be at least 5 mm high. If the appearance or size of a product do not allow for the CE marking to be affixed on the product itself, the marking has to be affixed to its packaging or accompanying documents
- Pre-testing early in the product development process can reduce cost and time to market

2.2. Labeling of Electrical Electronics Product

Electronic Labeling A modern and flexible approach to regulatory markings Lots of cool looking products on the market today! What's the problem with the Regulatory label? Solution is an Electronic label – 'Elabel'! What is an Electronic Label? An electronic means to display regulatory and other important information: Using a product's own built in display Providing a link to an internet website Example using a built in Display

- Some products already use an e-label: • Many mobile/cell phones support USSD code: *#07# Accessing the Label over the internet Who accepts electronic labels? Country / Agency Access Requirement Packaging Label Required? Reference US FCC No more than 3 menu steps, no special codes or accessories.
- Physical labels on the product are no longer fit for purpose – Too many marks – Too much complexity – Products are getting smaller
- E-Labeling: – A modern flexible approach › No physical restrictions › Can be updated throughout the life of the product › Accessible.

Self Check 2	Written Test

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

1. Explain, how to labeling Electronics product (5points)?
2. Explain, how to marking electronics Product (5points)?
3. Write six steps to CE marking (5points)?

Note: **Satisfactory rating – 15 points** **Unsatisfactory - below 15 points**

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

Score = _____

Rating: _____

Information sheet 3	Cleaning, checking, and make ready Dismantled parts

3.1. Cleaning, checking and make dismantled parts

How to Clean and Disinfect Electronic Devices

Do you wash your hands every time you touch your face or scratch your nose? Most people don't even realize they've done these things, much less stop to clean their hands. But think about what

happens when you scratch your mouth and then use the family computer or tablet. Electronics have a fixed place in our daily lives and are often shared by family members. Because of this, it's important to know how to clean your computer, laptop, tablet or smartphone. **Note:** When considering how to clean electronics, you should always check your manufacturer's instructions first, as the use of some products is not advised. If your device is damaged at some point, veering from the manufacturer's instructions could result in the nullification of any warranties you might have.

How to Clean Your Computer or Laptop Screen

Even people who think they never touch their screens seem to end up with unsightly smudges and smears. And if you have a cold or children with sticky fingers, your screen can get downright gross. Learn how to clean your computer and laptop screens for a clear view and — hopefully — fewer germs.

- To prevent damage or a nasty shock, you need to turn off power to your machine. For computers, you should power down and then unplug the device. You'll also want to unplug the individual monitors. Unplug laptops and remove their batteries if your model allows for this to be done.
- Gently wipe the monitor free of smears or dust using a microfiber cloth.
- If this doesn't work, you can us a solution of diluted dish soap, according to CNET. You'll only need a single drop of soap and the water should be warm.
- Dip a clean microfiber cloth into the solution and thoroughly wring it out. This is especially important when you're cleaning laptops, as you don't want liquid to drip down through the keys.
- Gently wipe your display with the dampened cloth.
- Rinse all the soap out of this cloth, and wring it out again. Go back over your display to remove any soap residue.
- Once more, gently wipe your screen, this time using a dry microfiber cloth.

How to Clean Your Computer Keyboard

It's common to snack or eat lunch while at the computer these days, which can lead to some gummy keyboards. These steps will show you how to clean your computer or laptop keyboard:

- You want to disconnect the power source first. For computers, you should power down and then unplug the device. Additionally, unplug the keyboard from the computer. If you use a wireless keyboard, remove the batteries. Laptops should be unplugged. If possible, remove the laptop batteries.
- Spray the keyboard with canned air to remove any leftover crumbs or dust.
- Lightly dab a cotton swab in gentle rubbing alcohol. Don't oversaturate the swab, as you want to prevent moisture from falling in between the keys.
- Swab each of the keys using a light circular motion. You'll want to do a spot test first to be sure the alcohol doesn't remove any lettering.
- Dry the keys using a microfiber cloth. Do not replace any batteries or plug in your machine until the keys are completely dry.

How to Clean Touch screens on a Routine Basis

In an ideal world, you should clean touch screens daily. After all, they see a lot of unwashed hands. Fortunately, everyday upkeep of smart phone and tablet surfaces is extremely easy: You just need to wipe it off with a dry microfiber cloth.

For a more thorough clean, you can use a slightly dampened microfiber cloth. When doing so, you'll need to unplug and power off the device before cleaning. You also want to be very careful to make certain you don't get any moisture in the openings. Clean touch screens with the cloth and then wipe displays dry with a fresh microfiber cloth. Afterwards, let screens dry completely before plugging devices back in or powering them on.

How to Disinfect Cell phones and Tablets

You may have heard that your smart phone screen has more bacteria than a toilet. Unfortunately, that's not just a dirty rumor. What's more is that tablets can be even more germ ridden. Here's how to disinfect cell phones and tablets;

- First, you'll need a touch screen-safe antimicrobial spray and a microfiber cloth. (There's a rift in popular opinion when it comes to whether alcohol-based sprays are OK to use on touch screens. Again, refer to your manufacturer's instructions.)
- Make sure your electronics are powered off and unplugged.

- Dampen a microfiber cloth with the spray, being careful not to oversaturate the cloth.
- Wipe down the screen, avoiding all openings.
- Allow the spray to sit for the amount of time noted on the product packaging.
- Wipe your screens dry with a fresh microfiber cloth.

Don't forget that your tablet cover needs to be cleaned from time to time. You can wash this with dish soap and a microfiber cloth.

- Remove your tablet from the cover.
- In a bowl, mix a couple of drops of dish soap with warm water.
- Dip your cloth into the solution so that it's damp, not saturated.
- Wipe down the cover.
- Rinse the cloth until it runs clean and then wring it out so that it's damp.
- Wipe the cover again to remove soapy residue.
- Leave the cover to air dry overnight or wipe it down with a dry cloth or paper towel.
- Make certain the cover is absolutely dry before re-inserting your tablet.

Keeping your computers, laptops and mobile devices wiped down can go a long way in reducing the amount of germs that get spread about your house. However, you may have to be even more diligent in other areas, especially in the winter when cold and flu cases spike. Check out these tips on household cleaning during flu season to see what you can do to further prevent sniffles and coughs in your home.

Self Check 3	Written Test

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

Part I

I. Write the answer of the following questions

1. How to clean electronics products (5points)?

2. How to check Dismantle products (5points)?

Part II.

II**.** Choose the correct answer for the following questions (10 point each)

1. When considering how to clean electronics, you should always

   a. check your manufacturer's instructions first, c. none

   b. Keeping your computers, d. all

Note: **Satisfactory rating – 20 points** **Unsatisfactory - below 20 points**

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

Score = _____
Rating: _____

Information Sheet 4	Identifying reuse and disposal Parts

4.1. Identify Reuse and Disposal parts

The terms recycling and reuse are often used as synonyms, it is incorrect, "recycle" refers to the process in which a raw material is used again to create something new. "Reuse" means use a product or its components it again for the same purpose or find another use for the item,

The concept of circular economy can become very elastic. Its meaning can vary drastically depending on the interests of the person who defines uses and implements it. For example, it is considered circular to burn waste for the generation of energy. If accepted, but will the burning of

a product that could have been reused continue to be considered as circular? What is the Circular Economy of Electronics?

The entities federated to ereuse.org recondition and resell used devices such as mobiles, laptops or desktops. This members also create open, local and autonomous reuse platforms that brings automation, traceability and auditability in all the steps in the life time of devices with the aim of efficiently implementing the circular economy in electronics. What is an Electronic Reuse Circuit?

In cities, city councils deliver device surpluses to ereuse.org members with great effect in creating inclusive jobs, starting or accelerating efficiency and scaling up formal, scalable and sustainable reuse platforms with great environmental, social and economic benefit. What is the impact of a reuse platform?

Figure 4.2. Reuse of electronics

The reuse of electronic devices such as desktops, laptops or mobile phones is applied to devices that have already been manufactured and are no longer in use (disposal) and will be recycled unless they are refurbished /reconditioned (repaired, upgraded) and used again or redistributed to other users [9].

We say a device or component is reusable if it has or may have use value for someone:

- If the use value of the device is high enough, it means that there is somewhere a potential user for that device as it is, and only a basic refurbishing processes is required, such as erasing data or restoring the operating system (this is represented as citizen reuse loop in next figure).

- If the use value is too low, its use value can be increased through several types of actions of refurbishment: repairing, replacing demaged components and updating/ugrade (this is represented as professional reuse loop in next figure).

The reuse process ends when after a few years the device or component reaches disposal state, which means its use value then, or through potential improvements, does not allow its reuse again. The cycle reach recycling to recover (reuse) raw materials and manufacture new components.

4.3.Circular Economy of Electronics

We define the Circular Economy of electronics reuse as the result of performing all viable reuse processes until the use value of devices does not allow further reuse, and that at the end of any reused device is recycled.

Therefore, there are two principles that are key to achieving Circular Economy of electronics:

1. **Traceability**: we should ensure that after multiple cycles of reuse devices end up being recycled
2. **Premature recycling**: we should ensure at the time of recycling devices have low use value, so there is no premature recycling.

If we apply these two principles, traceability to ensure recycling and, auditing use value to avoid premature recycling, society will preserve created computational value, thus making more efficient use of our resources (minerals, labor, pollution capacity, etc.).

4.3. Electronic Reuse Circuit?

Figure 4.3. Electronics Reuse Circuit

A circuit brings automation, traceability and audit ability in all the steps in the life time of devices with the aim of efficiently implementing the circular economy in electronics.

The entities federated to ereuse.org create circuits. There are two levels of circuits: the first level only includes reuse centers; at this level each actor has its own platform, looks for its equipment supply funds and establishes its collaboration agreements between the other entities. In the second level (collaborative), one (or more than one) entity participates with the purpose of zero waste or the reduction of the digital divide. It is an entity that does not carry out the tasks of a reuse centre, but rather of cohesion or umbrella, thus creating a network.

Collaborative Circuits establishes an agreement to manage, share and maintain the circularity of digital devices. The mission of a Circuit is to promote cooperation between entities in the reuse sector and the responsible, collaborative and circular use of digital devices. The Circuit promotes cooperation between digital device suppliers, circular economy entities that do the refurbishment and distribution, and receivers, who receive them for reuse. Platforms are usually made at the local level and actors seek collaboration rather than competition.

- suppliers, such as City Councils provision reusable products to a circuit through distributors. Supplier defines restrictions over products that the entire platform must

preserve. Ex: devices should only be used by non-profit entities, retailed at a fixed maximum price, etc…,

- distributors, have the objective of achieving zero waste or reduce the digital divide, distribute suppliers products to reuse centers and retailers most committed to the ereuse.org circular electronics license.
- reuse centers, increase the device use value through upgrade and repair processes and offer second-hand warranty. In some circuits, the device quota for refurbishers is in function of their refurbishment performance, so those who repair and upgrade rather than recycle receive more quota,
- retailers market platform devices and perform traceability during use phase until product reach collectors. In some platforms, the device quota for retailers are in function of their traceability performance, in other words, the retailer that percentually track more devices receives more devices,
- users, are citizens that prefer second hand devices for environmental reasons, citizens in risk of exclusion, organizations such as schools or social enterprises,
- collectors, collect and maps device value and derive products to refurbishers if reuse is possible or to recyclers if isn't,
- recyclers, locate and attempt raw material recovery if possible.

Impact of a reuse Circuit

Public administrations and local circular economy entities have formal, scalable and sustainable reuse platforms that offer traceability and guarantee proper recycling.

City councils deliver device surpluses to citizens and organizations, with great effect in creating inclusive jobs, starting or accelerating efficiency and scaling up of local exchange/market of second hand computers and mobiles, and related jobs of transport, refurbishment, support, recycling.

The users of devices are citizens that prefer second hand devices for environmental reasons, citizens in risk of exclusion supported or advised by public social services, and organizations demanding larger volume of devices such as schools, social enterprises, environment or budget-concerned public or private organizations.

Citizens benefit from a pool of devices at a lower economic and environmental cost, at well as creating local jobs (in social and commercial organizations) for the collection, refurbishment and support (computing-as-a-service) by locals for locals.

Self Check 4	Written Test

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

Part I

I. Write the answer of the following questions

1. Explain how to reuse Electronics product (5points)?
2. Write the two principles that are key to achieving Circular Economy of electronics (5points)?
3. Draw block diagram of electronics reuse (5points)?

Note: **Satisfactory rating – 15 points** **Unsatisfactory - below 15 points**

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

Score = _____

Rating: _____

Information Sheet 5	Identifying Disposed Items

5.1. Identify Disposed Items

Electronic waste, or e-waste, is said to be the fastest growing stream of hazardous waste in the world. E-waste is comprised of a variety of inputs including hazardous materials, potentially valuable and recyclable materials, and other inputs. E-waste follows a range of pathways after disposal, including formal and informal recycling, storage, and dumping, in both developed and less-developed country contexts. Globally, the handling and regulation of e-waste as both a hazardous waste stream and as a source of secondary raw materials has undergone significant changes in the past decade. A growing number of countries have adopted extended producer responsibility laws, which mandate electronics manufacturers to pay for proper recycling and disposal of electronics. The e-waste recycling industry is becoming more formalized as the potential to recover valuable materials has increased, but a range of recent studies have shown that e-waste recycling continues to carry a range of occupational health and environmental risks.

5.2. How do we get rid of Electronics waste

This term applies to consumer and business electronic equipment that is near or at the end of its useful life. There is no clear definition for electronic waste (e-waste) at this time, but if you can plug it in to an electrical outlet or it contains circuit boards or chips, it is most likely e-waste. These products can contain heavy metals like cadmium, lead, copper, and chromium that can contaminate the environment. DO NOT dispose of these items in the trash or your recycling bins.

Examples of electronic waste include, but not limited to:

- TVs, computer monitors, printers, scanners, keyboards, mice, cables, circuit boards, lamps, clocks, flashlight, calculators, phones, answering machines, digital/video cameras, radios, VCRs, DVD players, MP3 and CD players
- Kitchen equipment (toasters, coffee makers, microwave ovens)
- Laboratory equipment** (hot plates, microscopes, calorimeters)
- Broken computer monitors, television tubes (CRTs)

Any laboratory equipment that has the possibility of being contaminated with chemical,

biological, or radioactive substances must be cleared through EH&S and Departmental Facilities Office before disposal.

Self Check 5	Written Test

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

1. Explain how to Identify disposed product (5points)?
2. Explain how to rid and fix electronics waste (5points)?

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

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

Score = _____

Rating: _____

L #41	LO #5- Dispose the equipment

Instruction Sheet

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

- Obtaining approval for disposal
- Disposing equipment.
  - ✓ Disposal procedures and regulations
- Preparing report
- Discarding equipment

Complotting Reports and documentation This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Obtaining approval for disposal
- Disposing equipment.
  - ✓ Disposal procedures and regulations
- Preparing report
- Discarding equipment

Learning Instructions:

Read the specific objectives of this Learning Guide.
1. Follow the instructions described below.
2. Read the information written in the "Information Sheets". Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
3. Accomplish the "Self-checks" which are placed following all information sheets.
4. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).
5. If you earned a satisfactory evaluation proceed to "Operation sheets
6. Perform "the Learning activity performance test" which is placed following "Operation sheets"
7. If your performance is satisfactory proceed to the next learning guide,
8. If your performance is unsatisfactory, see your trainer for further instructions or go back to "Operation sheets".

Information Sheet 1	Obtaining approval for disposal

1.1. Waste disposal: Method of Obtaining approval of proposed disposal procedures

(1) Any person may apply to the department for approval of proposed procedures to dispose of radioactive material in a manner not otherwise authorized in this subchapter. Each application shall include a description of the radioactive material, including the quantities and kinds of radioactive material and levels of radioactivity involved, and the proposed manner and conditions of disposal. The application, where appropriate, should also include an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meteorological, and hydrological characteristics; usage of ground and surface waters in the general area; the nature and location of other potentially affected facilities; and procedures to be observed to minimize the risk of unexpected or hazardous exposures.

(2) The department will not approve any application for a license to receive radioactive material from other persons for disposal on land not owned by the state or the federal government.

Self Check 1	Written Test

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

1. Explain how to obtaining approval of proposed disposal procedures (10 points)?

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

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

Score = _____

Rating: _____

Information Sheet 2	Disposing Equipment

2.1. Disposing Equipment

According to the EPA, of the roughly 2.25 million tons of used and unwanted electronics each year, only 18% is collected for recycling and roughly 82% winds up in landfills. Clearly, as more and more e-waste is accumulating every year with our quickly developing technology, taking the steps to responsibly dispose of electronic equipment is a growing and important concern.

Figure 2.1. Disposal of unwanted Electronics

2.2. The Dangers of Improper E-waste disposal

Old computers, monitors, keyboards, printers, TVs, cell phones, and other electronic devices, referred to as "e-waste", contain dangerous lead, mercury, arsenic, cadmium, and more. Many of these metals comprise circuit boards and electrical parts such as computer chips, monitors, and wiring. Many electronics also include flame-retardant chemicals that might pose potential health risks when exposed. When these elements are safely encased in our computers and devices, e-waste dangers aren't problematic.

However when devices break, intentionally or accidentally, they can leak and contaminate the surrounding environment. This can be in a landfill or on the streets within a region full of struggling laborers. Over time, the toxic chemicals of a landfill's e-waste can seep into the ground, possibly entering the water supply or escaping into the atmosphere, affecting the health

of nearby communities. People are beginning to discuss the serious aspects of this pollution in terms of "bioaccumulation" and "biomagnifications". Bioaccumulation occurs when people, plants and animals build up levels of toxic substances in their bodies faster than they can get rid of them. Biomagnifications occurs when toxin levels accumulate within the food chain. For example, plankton might absorb low levels of mercury. Then fish that eat large amounts of plankton ingest an even larger, unhealthier dose. The problem continues as birds or humans eat the mercury-tainted fish. This problem is already occurring in much of the United States' wild-caught fish supply. Workers in developing countries tasked with taking apart old electronics also suffer, as they generally don't have the protective clothing and technology needed to ward off the harmful effects of toxins, and the e-waste disposal methods used are shoddy at best.

Figure 2.2. Waste Disposal Equipments

What to do with your E-waste

Your three main options are repairing, donating, or recycling old equipment. Before you pursue disposal options for a PC however, you will first want to wipe your computer's hard drive to ensure that no one will have access to your personal data. Most of the time this will just involve a simple formatting [11].

2.3. Disposal procedures and regulations

- **Create an action plan:** Bring together everyone who needs to be involved—IT, legal, office management staff and even C-level executives. Consider creating a decommissioning and asset management plan that makes data removal from hardware devices your highest priority. Evaluate the costs of managing an IT asset disposition plan—as well as the potential costs (legal and otherwise) of not doing it. And when these issues start to stump you, consider getting help from a third-party disposition expert with the expertise you need to address your data destruction and asset disposition needs.
- **Ask:** Before you dispose of your old hardware, you must ensure that all the data on it has been permanently destroyed and is non-recoverable. A trusted supplier can help you establish a defensible, documented and repeatable process to prepare, handle or transport and destroy data both onsite or offsite, using methods that comply with the latest UK and global standards.
- **Ensure that offsite, secure disposition processes are in place.** You need to know the whereabouts of your assets throughout their destruction process. That secure chain of custody is vital to prove you've complied with regulations. A trusted partner can provide auditable verification and strict security practices that include GPS tracking, protected transportation and a documented chain of custody. That means peace of mind for you.

When your secure IT asset disposition strategy is certified to comply with regulations such as the EU WEEE Directive and the ISO14001 Standard, you can prove compliance. These standards ensure that your old electronics should not:

- ✓ get "relocated" to developing nations
- ✓ be incinerated or dumped in landfills
- ✓ be disposed of in any way that puts recycling workers' health and safety at risk
- ✓ be at risk for security breaches of any kind

Adhering to these standards can help protect your private data, your reputation and your bottom line.

- **Keep an eye on the prize: your bottom line.** Getting managerial buy-in for an environmentally-friendly project can be difficult. Focus instead on the bottom line, making the case for the cost savings and risk management you can achieve by clearing out the old to make way for the new while also guarding against data breaches or thefts. Retiring old assets at the right time cuts maintenance costs, software licensing costs and even leasing overages. You can also regain some of your money back from secure asset re-marketing programmed.
- **Publicize your compliance achievements:** When you choose a compliant supplier, you know that your equipment is going to be destroyed or recycled without being exported, improperly incinerated, or land filled in a way that could harm the local water supply or affect other natural resources. That matters not only because regulations demand it, but also because recycling the right way gives your company green credibility and is an important part of a corporate responsibility programmed. Disposing of electronic equipment safely is about saving your company money and reducing its risk exposure. You can also work on saving the planet one asset at time

Self Check 2	Written Test

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

1. Explain Disposal procedures and regulations (7 points)?
2. Express Disposal equipments (6 points)?

Note: **Satisfactory rating – 7 points** **Unsatisfactory - below 7 points**

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

Score = _____

Rating: _____

Operation Sheet 2	LO5: Disposing Equipment

Operation Title: - Dispose Electronics equipment using disposal procedure

PURPOSE: -

- The trainee's will be able to keep the procedures.
- The trainee's will be able to Dispose equipments using disposal procedure.

Conditions or situations for operation: - Have a clean workspace with all necessary tools and equipment.

Equipment, Tools & Materials: - Disposal room, Glove, Eye glass, safety foot and body wears.

Procedure: - Dispose Electronics equipment using disposal procedure

Step 1: Prepare necessary materials and tools

Step 2: Make decision to perform disposal

Step 3: Undertake valuation processes

Step 4: Identify disposal option

Step 5: Prepare goods for disposal

Step 6: Dispose the equipment

Step 7: Treat revenue from disposal

Step 8: Review disposal processes

Precautions:-

- Take ESD precautions.
- Document everything (backup).
- Power off all devices and disconnect them from the main power supply.

Quality Criteria:-

- The trainee's use safety for documents &components.
- The trainee's make Dispose Electronics equipment using disposal procedure.

LAP TEST #2	Practical Demonstration

Name: _____ Date: _____

Time started: _____Time finished: _____

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

3. How to dispose electronics equipments?
4. From General safety precautions show the antistatic:
   - ✓ Electrostatic wrist strip
   - ✓ Antistatic mat
   - ✓ Antistatic box

➢ *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 3	Preparing Report

3.1. Preparing Report

Electronics Laboratory Report

Laboratory Experiment No. __

Written by: Date Performed:

Lab Partner: Lab Section #, day, time

Instructor: T.A.:

Front Page

The front page shown above is meant for laboratory reports. It may be altered in appropriate areas if it is a research report for a course, for example. The front page should be page 1, but the page number shouldn't be shown. All following pages, should have a page number, lower right. If the report is a research paper for an EE course, the instructor will likely provide you with appropriate alterations to the section headings, but in general, such as grammar, basic format, IEEE citations, etc., will follow this guide [12].

This document was developed to provide instruction on producing well-written technical reports. The document should be used as a general guideline, but it should also be recognized that different situations will require modifications to these guidelines. Discussion about each section was developed using the appropriate verb tense, formatting and language expected in a student's report. Specific instructions, written in ***italicized text***, follow the discussion. Examples, written in **bold text**, were also included.

The introduction should include the overall lab exercise objectives (not the objective of the instructor, but of the actual exercise itself). It is not necessary to use the word 'objective' in all introductions. Do not include figures or data here. This section is about what you did, not about what you learned; therefore, it is written completely in the past tense. This section it is about the technical work performed, not who performed the

work, and so it is never written in the first person. The DC transient response of an RC circuit was an analyzed in this lab experiment. Spice was used to simulate the circuit and then it was analyzed in hardware. The primary focus of the experiment was to compare the circuit's time-constant as a function of resistance. Multiple input frequencies were used to analyze the circuit's response during both transient and steady-state periods.

Background

Many students struggle to understand the importance of technical writing, but it is an extremely important engineering skill. Technical writing is one of the most important skills an engineer can possess. Even the best design is only acceptable if the engineer can accurately describe the design. The most novel concepts will only become profitable if the engineer can appropriately document the concept so that the company retains ownership of the concept. Without this ability, an engineer cannot be an effective employee. "Writing 'good' reports require much thought, organization and editing but the rewards are great. All attempts were made to write this document following the guidelines students should follow while writing a technical report. However, there is at least one critical difference between this document and a technical report: A report is NOT a set of instructions, but rather an explanation of the steps performed by the researcher to obtain a set of results and documentation of those results, whereas THIS document IS a set of instructions. Therefore, there were times when it was necessary to deviate from good technical writing to provide specific instructions – these deviations are italicized and should not be used as examples.

The Introduction of this document starts with an explanation of what was done. The first paragraph of the Background section is an example of providing motivation for the work being discussed, however this paragraph remained focused on the primary objectives of the report – it is an explanation of why the document was created as stated in the Introduction – a full history of technical writing is unwarranted. The second paragraph is an example of providing additional information necessary to understand the remainder of the report; in a technical report, this section could include a discussion/introduction of the equations used in the report to reduce the amount of writing required later.

There are times when the background section can include the use of present tense verbs. For example: Ohm's Law IS always true and can be stated as such in the background because this section is dedicated to generalities; however, when discussing Ohm's Law in following sections, the discussion should be focused on how it WAS used in the research.

Not all reports require a full background section. It is good practice to verify whether a background is required and, if so, what should be included, for each report.

Procedure

Describe the procedure that was followed in this section. Include sufficient detail on the exercise for someone to reproduce the work without the use of the instructor-provided lab manual. You may have multiple subsections here depending on the report; if so, the order of sections should follow the order they were performed. The list of subsections should always be introduced – do not follow the Procedure heading with subheading A. Do not include data here; circuit figures are acceptable. This is NOT a list of instructions, it is a description of WHAT WAS DONE; short lists are acceptable to specify some details, but should not be used to describe the main points.
This report can be broken into three sections, preparing to write the report, formatting the report and writing the report. (Notice this section does NOT start with the title of a subsection; there is at least a sentence of introduction before the first subsection. The subsections do NOT have to precisely follow the wording of the lab manual.)

Preparing to write a report

The use of a word processor, equation editor and drawing editor were required to write this report; it was not permissible to include any hand-drawn figures or equations. Software considered for these tasks include:

- Microsoft WORD
- Microsoft equation editor (add on to WORD)
- MathType (can be purchased for ~$60.00 at the time of this report)
- Microsoft VISIO (available to students for free)

- PSpice

Many subscripts, superscripts and Greek symbols were used. Before writing this report, the hot keys for subscripts, superscripts and similar formatting commands were learned. Also, hot keys for many commonly used Greek symbols were created by [13]:

- ✓ Clicking Insert/Symbol/More Symbols,
- ✓ Clicking Shortcut Key
- ✓ Typing desired shortcut into "Press new shortcut key:" field

Formatting the report

This report was carefully formatted according to the IEEE standards of technical writing. A properly formatted cover page was included. The font was chosen to be Times New Roman, Courier or Arial, and the spacing was set to 'single space.' Text was set to be full-justified. Page numbers were included in the lower right corner, but were suppressed on the title page.
Figures, Tables and Equations were center-justified and

- Figures were labeled below the figure with a number and title
- Tables were labeled above the figure with a number and title
- Equations were labeled with a right-justified number in parenthesis such as;

Pages should have "clean" first and last lines, if possible. This means that sections should not end on the first two lines of the 'next' page, figures and table labels should be included on the same page as the figure or table, lists should not end on the first two lines of the 'next page, etc. (This is not always possible, but the attempt should be made. Notice Table 1 is intentionally a poor example of this. Also note, this table was specifically related to procedures used – it does not include data.)

Writing the report

It was important to adhere to verb tense rules throughout writing the report. The vast majority of verbs used were past tense verbs. The report described what was done, what was collected, and what was observed. Exceptions to this rule may include discussion regarding on-going results, background material that is always true, or conclusion statements. Periodically, a writer may find other reasons to use present and/or future tense, however this should be done with caution and

avoided if possible. Third person was used throughout this report. The focus of writing was not on who wrote the report, or who performed the lab, but rather what was written, or what was performed.

Self Check 3	Written Test

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

1. Explain Electrical Electronics Laboratory report format (10 points)?

2. By using electronics laboratory format prepare lab report in one of your major course(15points)?

Note: **Satisfactory rating – 25 points** **Unsatisfactory - below 25 points**

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

Score = _____

Rating: _____

Information Sheet 4	Discarding Equipment

4.1. Discarding Equipments

Any Institute/College /University must dispose of all property (equipment, material, and supplies) through its established disposal procedures. Federal or agency property cannot be disposed, cannibalized, transferred, or removed without prior written approval from the funding agency or private entity. University-titled equipment may not be sold to employees, principal investigators, or to the public unless all disposal requirements have been met and the sale is processed by the Surplus Property Office. Property should not sit idle for lengthy periods of time. Where appropriate, items no longer required should be disposed of in a timely and appropriate manner.

Equipment Discarding - Equipment Disposal refers to both physically removing properties from a department and to the removing of the item from a department's active inventory, relieving the department of accountability for reporting and tracking. The terms disposal and surplus are often used interchangeably.

Note: When buildings are demolished or alterations made, there are usually some materials which are salvageable. Normally, under the terms of the contract, salvageable material becomes the property of the contractor. The contractor is responsible for removing this materially physically from the University campus and may then dispose of it as he or she sees fit. This removal requirement ensures that University employees will not remove such materials from the campus and thus appear to be taking University materials for their own personal use.

For information about the sale of property, or if you need to dispose of equipment that is located off-site or out of the country you need to obtain approval from Teresa Seyfried at Surplus Property [14].

Departmental Benefits of Timely Disposal

Departments benefit from timely and proper disposal of excess property because:

- Timely disposal makes property available to the entire campus.
- You may be able to reduce costs by using another department's idle equipment.

- Disposal of excess equipment reduces the time needed to locate unused equipment during required inventories.
- You are prepared for any audit.
- You may lose federal funding if your department is not in compliance

Legal Reasons for Timely Disposal

State: State law requires State/University property should not sit idle for lengthy periods of time. In a timely and appropriate manner, departments should dispose of items they no longer need.

Federal: It is a contractual commitment that federally owned equipment be in active use while in custody of a campus department, and that disposal action be taken in a timely manner if it is not.

Appropriate Disposal Methods

Detailed procedures of each method can be found at each of the links below.

- Surplus (standard) Disposal
- Cannibalize/Consume
- External Transfer (to another institution)
- Internal Transfer
- Return to Vendor, Credit/No Credit
- Trade-In
- Under certain circumstances it is possible for employees to buy their old work cell phones. See this page to determine whether this is an option for you; visit Surplus Property's website for details on the process.

Inappropriate Disposals Methods

- Throwing equipment and materials in the trash.
- Putting equipment in the hall under a sign saying "Free".
- Taking home equipment, materials, supplies, or unusable parts for personal use.
- Donating equipment without appropriate approval.

Lost/Stolen Equipment

- Lost Equipment - Remove equipment from your department's records if you are unable to locate it after applying a good faith effort. This usually occurs during a physical inventory. If the item is later found, Equipment Inventory can re-activate the item in the database. The Property Activity Request - Form 1024 should be used to report an item as lost.

  Note: If EIO notices that a department has reported an unusually large amount of equipment as lost, Internal Audit will be notified.

- Stolen Equipment - Remove equipment from your department's records if it was taken from the University without permission. It is also important that you file a police report. The Property Activity Request - Form 1024 should be used to report an item as stolen. This form should not be approved by the stolen equipment's custodian.

Self Check 4	Written Test

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

1. Write the benefit of timely disposal (10 points)?
2. Write at least 6 inappropriate disposing method (10points)?

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

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

Score = _____

Rating: _____

5.1. Reports and documentation

All waste removed from the site must be accompanied by a consignment/ chain-of-custody sheet or form, which is serialized for tracking and cross referencing. It includes the following information:

• Facility name and location (SOURCE of the waste)

• Date collected (REMOVED from site)

• Contents of container (DESCRIPTION of waste)

• Description of container (TYPE and CAPACITY/VOLUME)

• WEIGHT of container (usually in kilograms—a platform scale is recommended for this purpose)

• SIGNATURES from site manager overseeing collection and transport company representative

5.2. Documentations

Documentation Electronics Technician workers have a professional obligation to record the details of any consultation with a maintenances. The notes should reflect what was said (by the maintenance, in her own words) and what was seen and done (by the electronics worker). In cases of PC maintenances, the taking of accurate and complete notes during the course of an examination is critical for the following reasons:

● As Electronic technicians records can be used in shop as evidence, documenting the consequences of RAM problem may help the technician with its decision-making as well as provide information about past and present RAM problems.

● Documenting that a maintenances has been a victim of RAM problem will alert other Electronics care providers who later attend the RAM problem to this fact and so assist them in providing appropriate and sympathetic follow-up care.

● Documentation can provide administrators and policy-makers with an estimate of the incidence and prevalence of sexual violence that can be used to guide decisions about allocating resources.

Self Check 4	Written Test

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

1. Discuss documentations of disposed product (10points)?
2. Taking of accurate and complete notes during the course of an examination is critical for what reasons (10points)?

Note: **Satisfactory rating – 10 points** **Unsatisfactory - below 10 points**

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

Score = _____

Rating: _____

Reference

1. http://www.hispanovema.com/en/cbrn-decontamination-cbrn-decontamination-decon-agents/electronic-equipment-decon-agents
2. https://ambiente.messefrankfurt.com/content/dam/messefrankfurt-redaktion/ambiente/2020/download/amb2020-termin-en.pdf
3. https://www.entrepreneur.com/slideshow/299624
4. https://www.entrepreneur.com/slideshow/299624
5. https://managementmania.com/en/financial-resources-finance
6. https://www.smith-nephew.com/professional/training-and-education/policies-and-procedures/procedure-for-dismantling-waste-electrical-and-el/
7. https://www.mgchemicals.com/category/electronic-cleaning-products/electronic-cleaners/
8. https://www.pcmag.com/how-to/how-to-spring-clean-your-electronics
9. https://www.smith-nephew.com/professional/training-and-education/policies-and-procedures/procedure-for-dismantling-waste-electrical-and-el/
10. https://www.ereuse.org/reuse-of-electronics/
11. https://ehs.ucsc.edu/programs/waste-management/recycling-disposal/e-waste.html
12.https://www.intechopen.com/books/assessment-and-management-of-radioactive-and-electronic-wastes/electronic-waste-recycling-and-disposal-an-overview
13. https://blog.techvera.com/recycle-dispose-electronics-e-waste
14. https://www.ironmountain.co.uk/resources/general-articles/d/disposing-of-electronic-equipment-your-5-step-plan
12. https://www.sdstate.edu/electrical-engineering-and-computer-science/guidelines-writing-ee-lab-reports
13. http://edshare.soton.ac.uk/3457/
14. https://finance.uw.edu/eio/disposals.

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This TTLM developed on September 2020 at Bin International Hotel, Bishoftu.

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