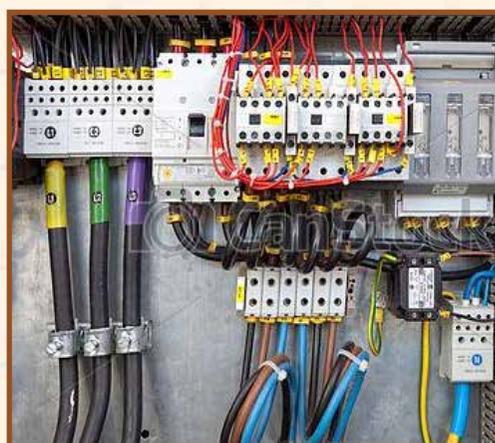




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# Facilitator Guide



Sector  
**Iron & Steel**

Sub-Sector  
**Steel, Sponge Iron, Ferro Alloys**

Occupation  
**Electrical Maintenance**

Reference ID: **ISC/Q1001, Version 1.0**  
NSQF Level: **3**

## Fitter – Electrical Assembly

## Published by

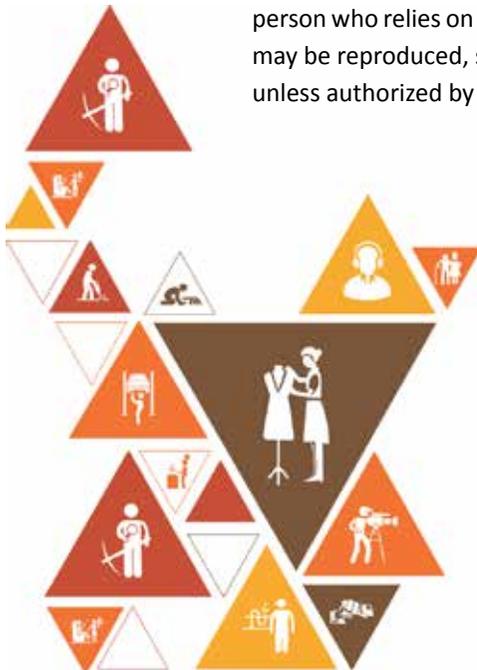
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Prime Minister of India

“ Skilling is building a better India.  
If we have to move India towards  
development then Skill Development  
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## Certificate

### COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

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**SKILLING CONTENT : PARTICIPANT HANDBOOK**

Complying to National Occupational Standards of

Job Role/ Qualification Pack: ' Fitter – Electrical Assembly ' QP No. ' ISC/Q1001 NSQF Level: 3 '

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## Acknowledgements



## About this book

This Facilitator Guide is designed to enable training for the specific Qualification Pack (QP). Each National Occupational (NOS) is covered across Unit/s.

Fitter is responsible for identifying the operations required to assemble various components of the machine and electrical panel by studying their engineering drawings, fitting different components of the machine to perform assigned task and testing the assembled machine. This book is all about training of operations required to assemble various components of the machine by studying their engineering drawings, fitting different components of the machine and testing the assembled machine under the proper supervision.

Key Learning Objectives for the specific NOS mark the beginning of the Unit/s for that NOS. The symbols used in this book are described below.

## Symbols Used



Steps



Time



Tips



Notes



Objectives



Do



Ask



Explain



Elaborate



Field Visit



Practical



Lab



Demonstrat



Exercise



Team Activity



Facilitation Notes



Learning Outcomes



Say



Resources



Activity



Summary



Role Play



Example

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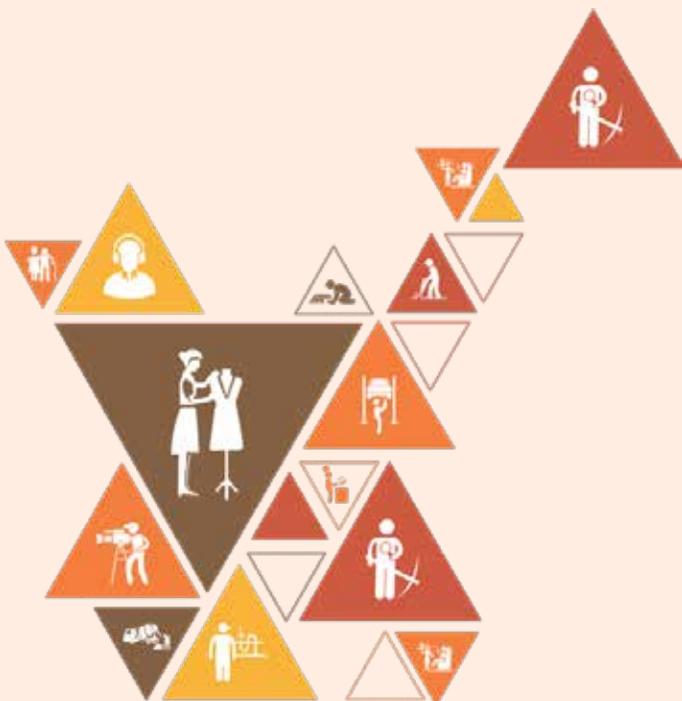


# 1. Introduction

Unit 1.1 - Understanding of Iron & steel industry

Unit 1.2 - Understanding various types of Iron & Steel Industry

Unit 1.3 - Creation of products in Iron & Steel industry



## Key Learning Outcomes

**At the end of this module, you will be able to:**

1. Discuss about Iron & Steel industry
2. Discuss about development activities in Iron & Steel industry
3. Discuss about employment opportunities in India
4. Know about industry structure
5. Know about Iron & Steel plants in India
6. Know about steel making procedure
7. Know about processes involve in steel making

## UNIT 1.1: Understanding of Iron & Steel Industry

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about Iron & Steel industry
2. Discuss about development activities in the industry
3. Know about opportunities in Iron & Steel Industry in India

### Resources to be Used

- Invigilator can use the available objects such as a marker, duster, pen, notebook etc.

### Do

- Take a parcel, mention some details such as student name, hobbies, likes, dislikes etc.
- Make the students stand in a circle, close enough to the person each side of them that they can
- Pass the parcel quickly.
- Say 'Stop' when the students least expect it. The person who has the parcel at that time should get out from the class.
- Those who get out should introduce themselves by providing the details mentioned in the parcel.
- The winner of the game should stand and introduce himself/herself at the end of the game.
- At last, say thank the students for their participation.

### Say

- India comes under the list of world's largest crude steel producer countries.
- Crude steel capacity of India reached 109.85 Million tonnes (MT), with a growth of 7.4 per cent.
- Requirement of large amount of iron ore and coal for production of steel.
- According to the data, the Indian metallurgical industries attracted Foreign Direct Investments (FDI) of around US\$ 8.7 billion.
- Indian government is aiming to increase steel production to 300 MT by 2025 in the country.

- The Ministry of Steel is facilitating setting up of an industry driven Steel Research and Technology Mission of India (SRTMI) in association with the public and private sector steel companies to spearhead research and development activities in the iron and steel industry at an initial corpus of Rs 200 crore.
- The total employment in the steel industry is more than 2 million which includes both direct and indirect employment.

### Notes for Facilitation

- You could ask the students who get out during the game to be the music keepers. They can start and stop the music as the game progresses.
- Encourage shy students to provide information about themselves by prompting them with questions such as 'what do you enjoy doing the most', 'what is your favorite movie or book' etc.
- Brief about iron and steel industry.
- What all conditions for the growth in iron and steel industry.
- Explain the government initiatives in this sector.
- You could ask from the students about employment opportunities in the industry.

## UNIT 1.2: Understanding various types of Iron & Steel Industry

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Discuss about Iron & Steel industry structure
2. Know about Iron & Steel plants in India

### Say

- The Iron and Steel Industry in India is separated into two divisions:
  - o Integrated producers, and
  - o Secondary producers
- TISCO is the oldest iron and steel plant of India.
- There are more than 50 Iron and Steel industries in India.
- Their capacity varying from ten thousand to five lakh tonnes, these are known as mini steel plants.

### Notes for Facilitation

- You could ask the students about the expectations from the course.
- Invite students to participate.
- List the major Iron and Steel producing companies in India.
- Give the students a brief overview of what all will be covered in the program.
- You could ask the location of different industries in India.
- You could ask the iron and steel industries name in India.

## UNIT 1.3: Creation of products in Iron & Steel Industry

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Discuss about steel making process
2. Know about different processes involved in steel making

### Say

- Production of steel involves many process steps which can be carried out in different combinations of energy supply, product mix, available raw materials and investment.
- There are many processes involved in steel making like coke making, blast furnace, smelting, reduction etc.
- Coke is produced by heating coking coals up to 1000 to 1200 °C for several hours in coke ovens to drive off volatile compounds and moisture.
- In Basic Oxygen Furnace (BOF)-Blast furnace (BF) route: pig iron is produced by using iron ore (70-100%) and coke in a blast furnace, and then turned into steel in a basic oxygen furnace.
- Smelting reduction unit combine processes for the gasification of coal with the melted iron ore.
- Smelting reduction unit has lower energy intensity than blast furnace

### Notes for Facilitation

- You could ask the students the three main steel making procedures.
- Give students some time to think about how the iron and steel industry has changed in the last five years.
- Set the context and describe the industry trends in iron and steel.
- You could ask the entire process involve in steel making.

### Field Visit

- You could visit the Iron and steel producing company and demonstrate the procedure of steel making



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## 2. Occupational, Health and safety (OHAS)

Unit 2.1 - Learn Occupational health & Safety

Unit 2.2 - What is hazard

Unit 2.3 - Working at Heights and confined spaces

Unit 2.4 – Fire prevention

Unit 2.5 - Emergencies, rescue and first aid procedures



ISC/N0008

## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Discuss about safety requirements, procedures, and resources for different areas
2. Discuss about safe work practices
3. Know about hazards, types of hazards and how to control hazards
4. Know about PPE requirements
5. Know about safe working practices at heights
6. Know about safe working practices at confined spaces
7. Discuss about protection from fire hazards
8. Know about fire extinguisher and how to use it.

## UNIT 2.1: Occupational, Health and Safety (OHAS)

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Discuss about health and safety requirements in industry
2. Know about essential elements for safety
3. Know about good safety work practices

### Resources to be Used

- Available objects such as a duster, pen, notebook etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts. At last, say thank the students for their participation.

### Say

- The health and safety of workers is a very important factor in this industry because it affects both social and economic factors of an organization.
- An iceberg of incidents is showing the nature of various types of accidents. They are unsafe actions, incidents, minor injuries, lost time injuries, serious accidents and fatalities.
- Three features are vital for advancement of safety in a workshop.
- Conducting regular safety audits to identify unsafe practices and areas and how to take corrective actions to overcome the issues. Safety audits can help in timely recognition of hazards and risks.

### Elaborate

- Three features are vital for advancement of safety in a workshop:
  - o Situation of environment of work place in terms of plant access, housekeeping, safety and safe place of work etc..
  - o Workers training and ability which assists them to recognize and apply safe systems of work.

- o The development of motivational and behavioral influences of employees. This includes identifying unsafe behavior and attitudes by using more direct strategies and to motivate employees.

### Ask

- Ask various type of accident.
- Ask three aspects are important for progress of safety in a steel plant.
- Ask the essential elements necessary for safety
- Ask about the good safety practices

### Notes for Facilitation

- You could ask what the students think about safety in steel plant.
- You could ask the benefits to adopt such technique.

## UNIT 2.2: Hazard

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about hazards and different types of hazards
2. Know about, how to identify and control hazards
3. Know about safe working practices

### Resources to be Used

- Available objects such as a duster, pen, notebook, PPE, heavy weight etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- A hazard is something that has the potential to cause injury, disease or death in a workplace.
- Aspects for the development of a safe workplace environment are development policies, consultative process, hazard identification and control.
- Hazards are of following types: Physical, Mechanical, chemical and Electrical etc.
- Mineral oil is typically used for operation purposes for bulk density control and dust suppression.
- The emissions contain numerous polycyclic aromatic hydrocarbons (PAHs), some of which are carcinogenic.
- Ensure the control measures

### Elaborate

There are a number of aspects to the development of a safe workplace environment.

- The development of policies
- The development of consultative processes

- Hazard identification, assessment and control.

A steel plant is full of hazards. For the sake of workers safety in plant, these hazards have to be tackled. Major hazards occur in plant are:

- Road hazards- road hazards are very high because of movement of heavy and heterogeneous traffic on plant. This hazard occurs mainly during the shift change timings of workers.
- Coke oven and sinter plant – Here hazards occur due to dust, heat, chemicals, smoke, fire and explosion etc.
- Blast furnace and steel melting shop – The main hazards occur here due to gas poisoning, heat, slag, dust, moving equipments and vehicles, fire and working at heights.
- Rolling mills – In rolling mills, the hazards occur are moving equipment, heat, suspended loads, splinters and slippery floors.
- Power plant – The main hazards are heat, working at height, noise, vibrations and gas and steam lines etc.
- Material handling – The main hazards occur due to improper material handling are posture, improper signaling, moving equipment, loads and suspended overhead loads etc.
- Other major hazards which are common to most of the places are working in confined space, working with improper tools, poor illumination, poor ventilation, electrical hazards, loco movements, unmanned crossings, unpreparedness for emergencies, unsafe scaffoldings, over confidence and working without safety appliances, personal protective equipments (PPEs), written clearances, and shutdown clearances etc.

### Ask



- You can ask the different types of hazard
- You can pick the students and ask the hazard warning sign.
- You can ask the different ideas to control the hazard.
- You could ask the common causes of hazard.

### Notes for Facilitation



- You could ask the hazard during workplace.
- You could show all the hazard warning sign and their differences.
- You could ask the various techniques to avoid and control from hazards.
- Give students some time to think about how the hazard affects physical and mentally to our body.

## Say

- There are safe practices need to be consider for avoiding general shop hazards
- There are safe practices need to be consider for avoiding machine hazards
- Every worker has to lift and move heavy weight during the job whenever required.
- Extreme care should be taken while lifting or moving the job so that no damage occurs to the job or plant and also to prevent accidents at work place.

## Elaborate

Personal protective equipment provides us the last level for controlling hazards. Before using of personal protective equipment, the working requirements of the equipment should be checked to make sure it fulfills the same, verify the required standards, make sure it fits the body shape of the user, be user-friendly and is under regular maintenance and can be switched if required.

### Personal Protective Equipment (PPE)

- **Safety helmet:** Safety helmets guard the head from injuries caused by falling objects.
- **Earmuffs, earplugs:** Earmuffs and earplugs protect the ears from injuries by loud noises.
- **Safety belt:** Safety harnesses guard from falling from heights.
- **Goggles:** Goggles protect the eyes from injuries caused by strong light or flying objects.
- **Safety boots:** Safety boots guard the feet from puncture wounds, injuries and slipping.
- **Respirator:** Respirators guard the respiratory system from the attack of poisonous gases, mist, fumes and dust.



Fig 2.2.1: PPE

## Ask

- You can pick the students and ask the safe practices for avoiding general shop hazards.
- You can ask the various types of personal protective equipment.

## Notes for Facilitation

- You could ask the safety checklist before operating a machine.
- You could show the protective equipment and ask the causes.
- You could ask the causes of wrong handling

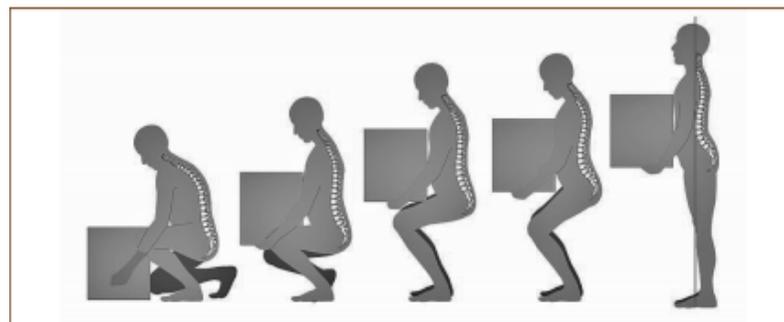
## Do

- Show them the PPE
- Demonstrate the use and requirement of PPE
- Demonstrate the safe material handling practices

## Demonstrate

Points to be taken care of while lifting / moving material

- Lift the materials in correct posture.
- Do not try to lift too heavy materials alone.
- Ensure the grip is right so that the job doesn't slip from hand and fall
- Put down the job at the destined place properly.
- Do not throw the job on ground.
- Avoid double handling.
- Take rest breaks during heavy or repetitive work.



**Fig 2.2.2:** Safe material lifting

**Activity** 

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
PPE and Safe material handling	2 hours	PPE
		Heavy weight

**Do** 

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

**Lab** 

- You could show the various personal protective equipments (PPE) to the students in the lab

## UNIT 2.3: Working at heights and confined spaces

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about risks of working at heights
2. Know about safety precautions while working at heights
3. Discuss about risks of working at confined spaces
4. Know about safety precautions while working at confined spaces

### Resources to be Used

- Available objects such as a duster, pen, notebook, ladder, respiratory equipments etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Notes for Facilitation

- You could ask the students about the understanding of safe working practices at heights and confined spaces.
- Invite students to participate. List the responses from students on the whiteboard.
- Give the students a brief overview of what all will be covered in the program.

## 2.3.1: Safe working at heights

### Say



- Falls from height are responsible for many serious and fatal injuries every year.
- The Health and Safety Executive recommends a five-step approach to risk assessment, and the risk of slips, trips and falls should also be considered.

### Elaborate



The main hazards associated with working at height are people falling and objects falling onto people below. These may occur as a result of inadequate edge protection, or from objects in storage being poorly secured.

Safety equipments can use while working at heights:

- Mobile elevated platforms
- Ladders
- Step-ladders
- Scaffolder
- Harnessing belts

### Do



- Show the risk assessment procedure
  1. Look for hazards associated with falls from height around the workplace. Where are people required to work at height? Do they carry out work from ladders, platforms, scaffolds, or unprotected or fragile roofs?
  2. Decide who might be harmed and how. Who comes into the workplace? Are they at risk? Are some groups more at risk than others?
  3. Consider the risks. Are there already measures in place to deal with the risks? Look at areas with unguarded openings or without guardrails and covers. Are regular inspections carried out?
  4. Record your findings if you have five or more employees.
  5. Regularly review the assessment. If any significant changes take place, make sure that precautions are still adequate to deal with the risks.
- Demonstrate the safe use of ladders

## Demonstrate

Steps of how to work safely on ladder:

1. Climb only the front of the ladder, never the back.
2. Don't climb higher than the tread that's third from the top (there should be two steps above you, including the top); never sit on the top.
3. Keep your hips centered between the vertical side rails; don't overreach to either side.
4. Never stand on the spreaders or paint shelf.
5. Don't leave ladders unattended, especially around children.
6. Allow only one person on the ladder at a time.
7. Never lean a closed stepladder against a wall and climb it; it can slide out from under you.

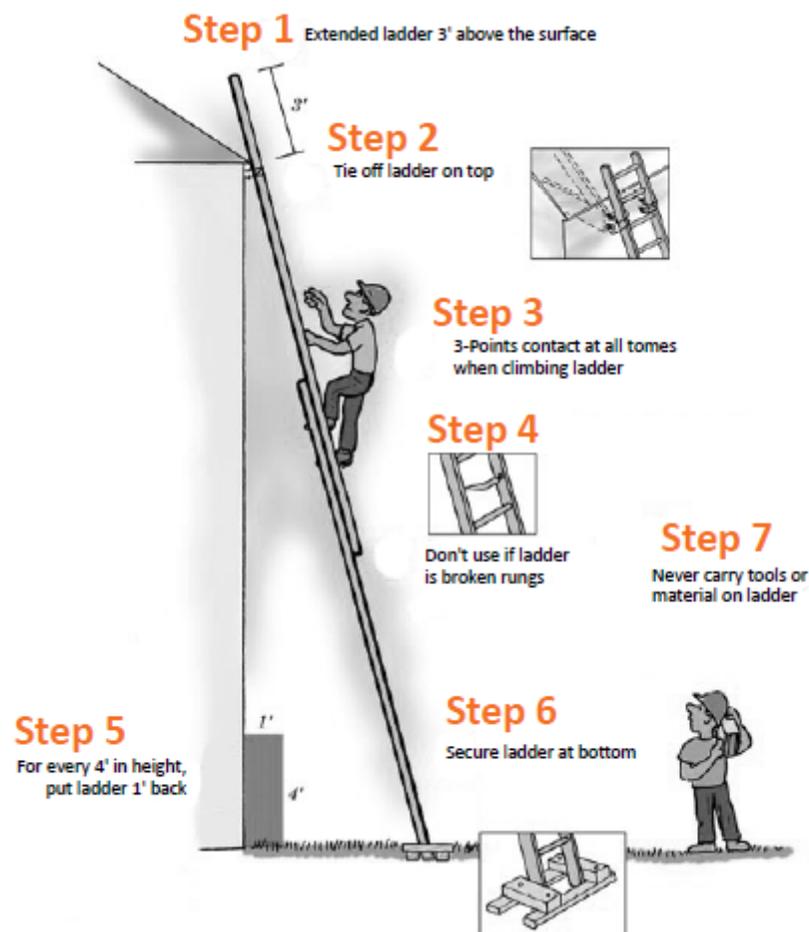


Fig 2.3.1: Safe use of ladder

## Do's

- Work on ground level, as much as possible.
- Make sure equipment is sufficiently stable, appropriate and strong for the job.

- When working on or near delicate areas, take safeguards
- Always be prepared for protection from falling objects
- make strategy for evacuation in case of emergency and rescue procedures

### Don't

- Overload ladders
- Overreach on ladders or stepladders
- Fix the ladder on weak and uneven surfaces
- Use stepladders or ladders for tough or heavy tasks.

### Ask

- You could ask the safe working procedure while working at height.

## 2.3.2: Safe working at confined spaces

### Say



- Spaces which are enclosed from all around and risk of death or serious injury from dangerous conditions and hazardous substances is very high, are known as confined spaces.
- If you cannot avoid entry into a confined space, make sure you have a safe system for working inside the space.

### Elaborate



Dangers can arise in confined spaces because of the following issues.

- A lack of oxygen. This can occur:
  - Spaces where reaction between some soils type and oxygen happens in the atmosphere;
  - Reaction of groundwater with limestone produces carbon dioxide;
  - Rust formation inside the vessels and steel tanks.
- Poisonous gas, fume:
  - Formation of poisonous gases in sewers and manholes;
  - Leakage of gases and fumes into trenches and pits in a poisonous area.
  - enter tanks or vessels from connecting pipes;
- Liquids and solids which can suddenly fill the space, or release gases into it, when disturbed. Free-flowing solids such as grain can also partially solidify or 'bridge' in silos, causing blockages which can collapse unexpectedly.
- Fire and explosions due to excess oxygen and flammable vapours.
- Filling of liquids and solids inside the space, when disturbed.
- Hot temperature conditions leading to increase in body temperature dangerously.
- Residues of fumes and vapour left in tanks, vessels etc.
- High concentrations of dust e.g. in flour silos.

#### Safe systems of work at confined spaces

If you have to work in a confined space, carry safety systems and equipments for working inside the space. The following checklist is important while working in a confined space.

- **Isolation:** Isolate the electrical and mechanical system of equipments need to be operating in space. In any cases, ensure that isolation done is effective.

- **Cleaning:** Make sure that there is no formation of fumes from residues during the work.
- **Size of entrance:** Entrance size is big enough to permit workers to enter in the space with all the necessary equipment required, and provide ready exit during an emergency.
- **Provision of ventilation:** Ensure that there is proper mechanical ventilation for an adequate supply of fresh air in the confined space. It is very important where portable gas cylinders and diesel fuelled equipment are used.
- **Isolation:** Mechanical and electrical isolation of equipment is essential if it could otherwise operate, or be operated, inadvertently. If gas, fume or vapour could enter the confined space, you need to isolate the pipework. In all cases, a check should be made to ensure isolation is effective.
- **Cleaning:** before entry this may be necessary to ensure fumes do not develop from residues etc while the work is done.
- **Check the size of the entrance:** Is it big enough to allow workers wearing all the necessary equipment to climb in and out easily, and provide ready access and exit in an emergency? For example, the size of the opening may mean choosing air-line breathing apparatus in place of self-contained equipment which is more bulky and therefore likely to restrict ready passage.
- **Provision of ventilation:** You may be able to increase the number of openings and therefore improve ventilation. Mechanical ventilation may be needed to make sure there is an adequate supply of fresh air. This is essential where portable gas cylinders and diesel fuelled equipment are used inside the space because of the dangers from build-up of engine exhaust.
- **Provision of special tools and lighting:** Use non-sparking tools and protected lighting systems to avoid flammable and explosive atmospheres. In confined space like inside metal tanks, appropriate precautions are required for safety from electric shock.
- **Provision of breathing apparatus:** Availability of breathing apparatus, if the air inside the space is not adequate and suitable for breathing because of poisonous fumes, gases or vapours in the space and lack of oxygen.
- **Preparation of emergency arrangements:** Proper emergency arrangements which cover the necessary equipments and practice drills.
- **Provision of rescue harnesses:** Availability of safety harnesses at the point outside the confined space.
- **Emergency procedures:** When situations are not favorable, there can be chance of serious and immediate danger. Effective arrangements like alarm systems and rescue operations during an emergency are essential.

## Notes for Facilitation



- You could ask about essential elements to help prepare a safe system of work at confined spaces.
- Show them the safety equipments required while working at confined spaces.

## Ask



- You could ask the confined space at safe working.
- You could ask how the danger can arise in confined space.
- What can occur if there is lack of oxygen?
- You could ask the isolation process.
- You could ask the safe systems of work at confined spaces.

## UNIT 2.4: Fire Prevention

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about fire hazards and how to control
2. Discuss about fire extinguishers
3. Know about types of fire extinguishers
4. Know about how to use fire extinguishers

### Resources to be Used

- Available objects such as a duster, pen, notebook, fire extinguisher, fire alarm, PPE etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- Fire is defined as a self-sustaining combustion process in which a substance (fuel) combines with oxygen in air to produce immense heat and light.
- Fire hazards pose threats to life and property.
- Fire is categorized into class A, B and C fire.
- A fire extinguisher is a fire protection device used to extinguish or control small fires during fire emergency situations.
- Dry chemical is a powder based. They stops and halts the production of fire supporting by “free-radicals”, accordingly extinguish the fire.

### Elaborate

Different fuels create different fires and require different types of fire extinguishing agents.



#### Class A

Class A fires are fires in ordinary combustibles such as wood, paper, cloth, trash, and Plastics.



#### Class B

Class B fires are fires in flammable liquids such as gasoline, petroleum oil and paint. Class B fires also include flammable gases such as propane and butane. Class B fires do not include fires involving cooking oils and grease.



#### Class C

Class C fires are fires involving energized electrical equipment such as motors, transformers, and appliances. Remove the power and the Class C fire becomes one of the other classes of fire.



#### Class D

Class D fires are fires in combustible metals such as potassium, sodium, aluminum and magnesium.

#### Common fire extinguishers are:

- **Dry chemical:** These types of fire extinguisher are in powder form. They stop and halt the production of fire supporting by “free-radicals”, accordingly extinguish the fire.
- **Foams:** This type is applied over aspirated or non-aspirated fuels. It forms a seal or foamy blanket over the fuel and stops oxygen to reach near the fuel. Unlike powder type, foam type fire extinguisher is used to extinguish fires without flashback.



*Fig 2.4.1: Fire extinguisher*

- **Water:** It cools burning material by absorbing heat through the use of air pressurized water. It is successful to extinguish class A fires. Unlike dry chemicals and foams based fire extinguisher it is harmless, inexpensive and easy to clean.
- **Clean agents and carbon dioxide:** These types of extinguisher displace oxygen, control chemical chain reaction and remove heat from fire zone. This extinguisher does not leave any remains after release which is ideal for electronics items and sensitive documents.

## Do

- Tell them about the fire fighting equipments.
- Show them the equipments and explain their use.
- Demonstrate them the use of fire extinguisher.
- Explain them about different types of fire extinguishers.

## Demonstrate

### Steps for using the fire extinguisher

**Step 1:** Pull the pin from the top of the extinguisher for releasing locking mechanism which discharges the extinguisher.

**Step 2:** Aim the extinguisher towards the base of the fire not the flame.

**Step 3:** Squeeze the lever slowly. Deliver the extinguishing agent in the extinguisher. When the lever of extinguisher is released, the discharge of extinguishing agent stops.

**Step 4:** Sweep from side to side. Move the fire extinguisher to and fro by sweeping motion until the fire is under control. Operate the extinguisher from a safe distance. Move towards the fire when it starts to reduce.



**P**ull the extinguisher's safety pin



**A**im the extinguisher at the source of the flames



**S**queeze the trigger and hold it



**S**weep the source of the flames until the extinguisher runs dry

Fig 2.4.2: Using fire extinguisher

## Notes for Facilitation

- You could ask the common fire extinguisher.
- You could ask the type of fire extinguisher and their role?
- You could ask what all information contains fire drill report.

## Tips - During fire outbreak

1. On noticing a fire, immediately start shouting “fire” at top of your voice. Do not wait for the automatic fire alarms to start ringing.
2. Take a fire extinguisher
3. Use extinguisher as per fire type: - Water and co2 fire extinguishers for general fires - Foam type extinguishers for oil fires - Co2 fire extinguisher only for electrical fires.
4. Switch off all main switches during an electrical fire.
5. Do not try to switch off electrical equipment. Cut the power from the main source.
6. do not panic and alert the building fire department
7. Call the fire brigade immediately.
8. Ensure that the water sprinklers and other fire-fighting equipment have started operating.
9. First priority should be to save people. Help others to safely get out of the floor
10. Alert the nearest hospital to prepare to treat serious burn injuries.

## Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Use of fire extinguisher	2 hours	Fire extinguisher
		PPE

Do 

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

Field Visit 

- You could visit any of the industry and show the firefighting equipment. With the help of field visit you could show the where we need to fit various firefighting equipment and its role.

## UNIT 2.5: Emergencies, rescue and first aid procedures

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about basic first aid techniques during electric shock, burns and choking
2. Know about CPR process
3. Know about bandaging process

### Say

- If you think someone is suffering from electric shock, approach with extreme caution.

### Demonstrate

You can make a group of few students to do demonstrate:

#### Steps - How to free a person from electrocution

If find someone is suffering from electric shock, approach with extreme caution and following first aid steps.

**Step 1: Firstly take** the suffered person away from the electricity source as fast as possible. Turning off the electric supply of machine is the best method for doing this.

**Step 2:** If this seems impossible, remove the person from electricity source by using a piece of wood or insulating material.

**Step 3: Don't touch the victim getting the electric shock** because you could also get shock too.

**Step 4: After successful executing the victim from the electricity source,** call the ambulance, if victim is unconscious. Give first-aid to victim till the time ambulance is coming.

**Step 5: If victim is conscious** and looking well, monitor its condition, as the results of shock must not be clear immediately.



**Fig 2.5.1:** Freeing a person from electrocution

## Bleeding and Wounds

- Step 1:** Cover the wound by a clean cloth and gloved hand; then apply firm and steady pressure on wound for 5 mins at least.
- Step 2:** Lift up the injured leg or arm above the victim's heart level.
- Step 3:** Secure the wound by a bandage when bleeding stops. Ensure that bandage is not fixed too tightly—it may stop blood circulation.
- Step 4:** Check the victim for shock.

## Burns

### Chemical or Compressed Gas Burns

- Step 1:** Use a drench hose and emergency shower for at least 15 mins to rinse away all residues of chemicals.
- Step 2:** Cover the burn by a clean and dry cloth or special dressing for burns.

### Heat or Electrical Burns

- Step 1:** Cool burning of skin by water.
- Step 2:** Place the burned area under cold running water if the skin is not broken and gently compress the wound by hand. Bandage the wound by a dry and clean cloth.
- Step 3:** If blister appear, don't try to break it.
- Step 4:** Do not apply ointments or creams.
- Step 5:** If skin is cracked, or if injuries are severe:
- Do not clean the wound or remove embedded clothing.
  - Cover the injury insecurely with a clean, dry cloth.
  - Expect shock and treat accordingly.

## Choking

- Step 1:** Wrap your arms around the stomach and stand directly behind the victim.
- Step 2:** Just above the navel and well below the ribs, make a fist by a hand. Place that fist with the thumb and forefinger side toward you.
- Step 3:** Hold the fist by other hand and pull it rapidly towards you by a slightly upward and inward thrust. If required, repeat it.

## Basic techniques of banding

The key points when applying a bandage are:

- Step 1:** Make sure the person is comfortable.
- Step 2:** Never lean across their body and ensure that you are working from the side of the injury.
- Step 3:** First clean the wound and apply the antibacterial cream over it.
- Step 4:** When the bandage is on always remember keep the injured part of the body supported in the position it will be in.
- Step 5:** Always use right size of bandage.
- Step 6:** To check the passage easily, don't cover fingers or toes when bandaging a limb.
- Step 7:** Never wrap the bandage tight, and secure the end by folding it over and binding a knot in the end. Safety pin, adhesive tape, or a bandage clip can be used.

## Artificial respiration and the CPR Process

- Step 1:** Check the Victim - tap and shout to get response.
- Step 2:** Circulation - pump the chest 30 times.
- Step 3:** At the center of the chest put the heel of one hand and your other hand on top of it. At a rate of 100 per minute (16 compressions in 10 seconds), press chest down 2 inches.
- Step 4:** Tilt head back, lift chin up to open airway - Airway.
- Step 5:** Breathing - Tweak nose closed, take a normal breath, cover patient mouth with yours and blow out your breath until you see the chest rise. Make one breath per 1 second. Again open airway again if chest doesn't rise.
- Step 6:** Repeat procedure until help arrives or the victim begins breathing.



Fig 2.5.2: CPR Process

## Correct method to move injured people during an emergency

- Step 1:** Stand on either side of the conscious victim. Grab the victim's wrist with the hand closest to the victim's feet on your side.
- Step 2:** Use your other hand to grasp the clothing on the shoulder nearest to you and pull the victim's arms to help them to a sitting position.
- Step 3:** Assist the victim to his or her feet and place the arms around your shoulders, if possible.

**Step 4:** Place your free hand around the person’s waist and let him or her set the pace on hobbling out.

**Step.5:** Help the victim for moving slowly.

**Do** 

- Shock can be life threatening. Symptoms include cold sweat, weakness, irregular breathing, chills, pale or bluish lips and fingernails, rapid weak pulse and nausea.

SHOCK	Do’s	Don’t
Shock	Take a rest	Do not give the victim anything to eat or drink
Shock	Lay the victim on his/her back	Do not move him/her.
Shock	Keep the victim warm by using the blanket or clothes.	Do not keep the victim hot.
Shock	If the victim not in pain, raise their feet and legs with a pillow.	If victim in pain do not move.

**Notes for Facilitation** 

- You could ask the steps to free a person from electrocution.
- You could ask the steps of bleeding and wounds
- You could ask the steps of burn
- You could ask the steps of choking
- You could ask the steps of banding
- You could ask the steps of CPR

## Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
First aid practices	3 hours	Mannequin
		First aid box

## Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.



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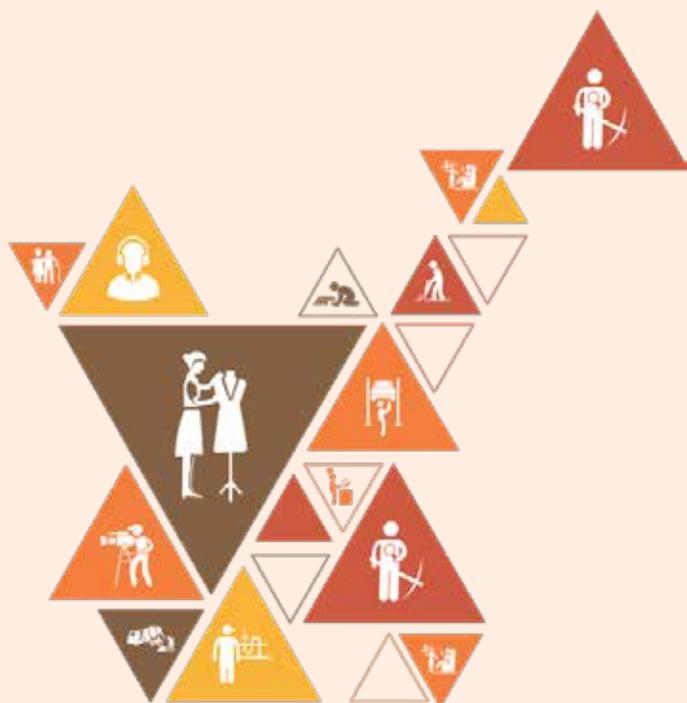
Transforming the skill landscape



## 3. 5S & House Keeping

Unit 3.1 – Identification of bottlenecks in functioning of work place

Unit 3.2 - Various methods of housekeeping



ISC/N1004

## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Discuss about safety issues at workplace
2. Know about 5S safety management system
3. Discuss about housekeeping practices
4. Know about benefits of housekeeping
5. Know about elements of effective housekeeping
6. Know about waste management practices

## UNIT 3.1: Identification of bottlenecks in functioning of work place

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about safety issues in the industry
2. Know about housekeeping issues in the industry

### Resources to be Used

- Available objects such as a duster, pen, notebook etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- Manufacturing facilities are riddled with risks, both hidden and out in the open. Hazards can result in serious injury or death, if don't know where to begin looking.
- Few of the biggest safety concerns in any manufacturing setting like hearing protection, eye hazards, chemical exposures, mechanical hazards etc
- The Occupational Safety & Health Administration requires companies to provide hearing guard when noise levels surpass specific levels.
- 61 percent of eye damages occur in the manufacturing, construction industries and trade a report by the Vision Council reports.
- In manufacturing, heat and flame can produce by the tools and equipment, which cumulative the risk for fires.
- During the manufacturing process, at many points dust and fumes are generated. Dense fumes released during the use of oxygen can cause lung diseases.

## Elaborate



Safety concerns in any manufacturing setting are:

- **Hearing Protection:** Hearing can be affected by noise produced by industrial machines if you are uncovered to the noise on a long basis.
- **Eye Hazards:** 61 percent of eye damages occur in the manufacturing, construction industries and trade a report by the Vision Council reports. Eyes may be injured by dust, metal, concrete and other particles thrown by machines. Eyes can burn or irritate by chemical fumes and splashes.
- **Chemical Exposure:** Some employees in manufacturing units work with hazardous chemicals like workers who produce batteries may be exposed to lead in the form of dust or fumes. This can harm nervous, urinary systems and reproductive with lead exposure linked to failures, seizures, coma and death.
- **Mechanical Hazards:** There are several risks to employees while working with manufacturing machines. Machines that have sprockets, gears, pulleys and rotating shafts pose risks of predicament.
- **Fire Hazards:** In manufacturing, heat and flame can be produced by the tools and equipment, which cumulative the risk for fires. Employees should be aware of where to find fire extinguishers and how to rescue the facility immediately in the event of a serious fire.
- **Carbon monoxide poisoning:** In manufacturing industries, blast furnaces and converters generate huge amounts of gases. Once dust has been removed, these gases are used as fuel resources and some are used as raw materials and supplied to chemical plants.
- **Dust and fumes:** During the manufacturing process, at many points dust and fumes are generated. Dense fumes released during the use of oxygen can cause lung diseases. Contact with silica is also a danger for the workers and causes serious infections and injuries.



Fig 3.1.1: Chemicals



Fig 3.1.2: Mechanical hazard



Fig 3.1.3: Dust and fumes

## Notes for Facilitation



- You could ask the students about safety concerns in a manufacturing plant.
- Invite students to participate.
- You could ask the students how carbon monoxide poisoning is released.
- You could ask the students about the effects of chemical exposure.

## UNIT 3.2: Various methods of Housekeeping

### Unit Objectives

At the end of this unit, students will be able to:

1. Know about 5S Safety system
2. Discuss about essential elements of housekeeping
3. Know about good housekeeping practices

### Say

- 5S is a fundamental, systematic, basic, approach for quality, productivity and safety improvement.
- 5S is created by a list of five Japanese words: seiri, seiton, seiso, seiketsu, and shitsuke.
- Workplaces hazards can be eliminate by effective housekeeping and complete a job safely and properly.
- Poor housekeeping and hiding hazards can cause frequent accidents which can cause injuries.
- Elements of an effective housekeeping program are Dust and Dirt removal, clean surfaces, Maintain light fixtures, aisles and stairways, spills control, waste disposal, storage etc.

### Elaborate

5S is created by a list of five Japanese words: seiri, seiton, seiso, seiketsu, and shitsuke. 5S system is implemented for organizing the workplace for increasing effectiveness and efficiency by maintaining the area and items, storing the items used, and sustaining the new practices.

Purposes of conducting regular 5S audits are:

- Evaluation of 5S standards for industry
- To fix what is wrong! - note and address non-compliance
- Give a official chance to suggest improvements

The basic steps of 5S audit are:

- Plan for the audit. Divide the workplace into several areas for successful audit reviews.

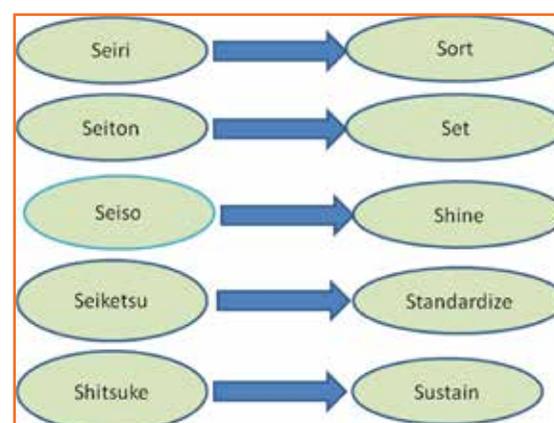


Fig 3.2.1: 5S terminology

- Based on the standards set during audit, make a list for every area.

Three key tasks has to be done during the audit

1. Find out whether known difficulties have been addressed:
  - Lubricants are still leak from this machine?
  - People are not walking under crane, is the warning sign in place?
  - Why outdated drill press is still in the workshop?
2. Look into the standards is being met:
  - Are tools left on work tables?
  - From the tool rack is something missing?
  - Is dirt collecting anywhere?
  - Are safety labels visible and readable?
3. To be noted that what has not yet been standardized – Most imaginative and hard section, it may include seeing what is missing in an area that seems neat:
  - Why is there no sign over the well-ordered stack of work-in-process materials on that shelf?
  - Tools that are not yet labeled

### Housekeeping

Cleanliness doesn't mean housekeeping. Housekeeping includes keeping work areas tidy and arranged; keep floors free of slip and trip accidents; clearing of waste materials (paper, cardboard) and other fire hazards.

Efficient housekeeping results in:

- Decrease handling to comfort the materials flow
- Fewer slipping and tripping accidents
- Less fire hazards
- Hazardous substances e.g. dusts, vapors exposures to lower worker
- Better control of tools and materials in managing inventory and supplies
- Equipment's are more cleaned and well maintained.
- Better hygienic conditions for good health
- Space utilization is more efficient
- Reduced property damage due to improvement in preventive maintenance
- Improved efficiency because it is easy to find tools and materials.

### Ask

- You could ask the objectives and advantages of 5S
- You could ask the benefits of good housekeeping practices.
- You could ask the elements of an effective housekeeping program

### Notes for Facilitation

- Invite students to participate.
- You could ask about the standards that were set during 5S for make a checklist
- You could ask how housekeeping program make effective.

### Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Do the 5S audit of your training center and make the 5S Audit form and fill it.

### Field Visit

You could visit any of the industry and show the 5S Safety system and check the various points of safety with the help of housekeeping checklist





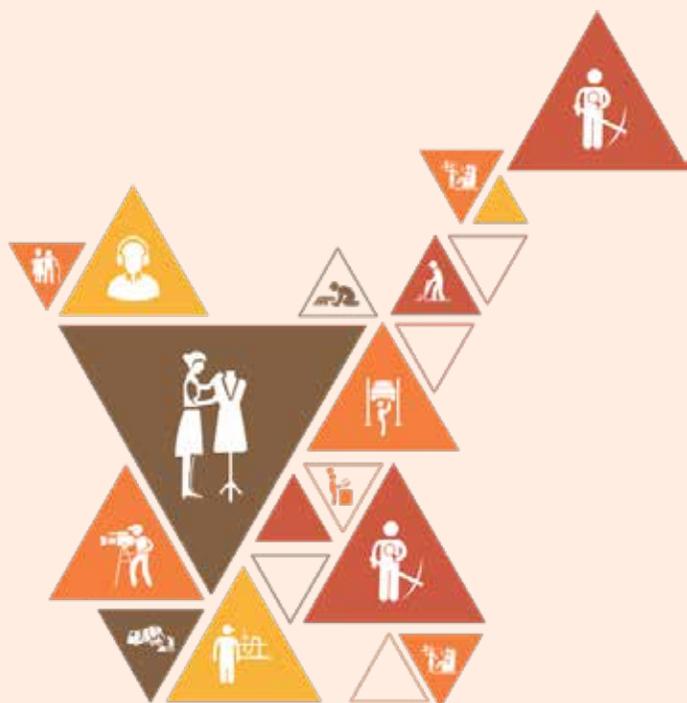
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# 4. Basic principles of electricity

Unit 4.1 – Electricity fundamentals

Unit 4.2 – Electric circuits and Ohm's law



ISC/N1001

## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Discuss about basic electric fundamentals
2. Discuss about how electricity generate
3. Discuss about different sources of electricity generation
4. Know about how current flow in the circuit
5. Know about ohm's law
6. Know about electrical circuit
7. Know about different types of electric circuit

## UNIT 4.1: Electricity fundamentals

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Understanding of electricity and how electricity generate
2. Understanding of conductors, insulators and semiconductors
3. Understanding of how a conductor, conducts electricity
4. Know about different sources of electricity

### Resources to be Used

- Available objects such as a duster, pen, notebook etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- The most important system today is the electrical system. Electricity is used by more and more components and systems every year.
- It may be hard for some people to know about electricity because of the following reasons.
  - o It cannot be visible.
  - o Output of electricity can be visible.
  - o It has to be spotted and calculate.
  - o The test results have to be interpreted.
- Movement of electrons from one atom to another is called electricity.
- Materials can be classified into three types based on their ability of conducting electricity – Conductors, insulators and semiconductors.
- A flow of electric charge is known as an electric current. This charge is often carried by moving electrons in a wire in electric circuits.
- Ampere is the SI unit for calculating an electric current.
- Electricity can generate from the following sources: Friction, heat, light, magnetism etc.

## Elaborate

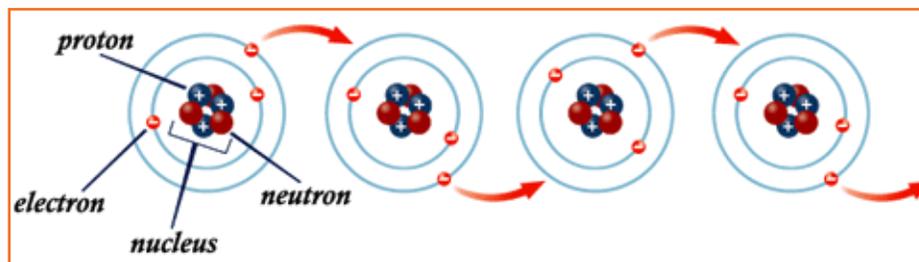


Movement of electrons from one atom to another is called electricity. Nucleus is defined by the dense centre of each atom.

The nucleus covers:

- *Protons , have positive charge*
- *Neutrons , electrically neutral (have no charge)*

Electrons are moving around the nucleus in orbits and carries negative charge. An equivalent number of electrons and protons are available in each atom. Type of material and how electricity is conducted can be determined by the no. electrons and protons in the atom.



**Fig 4.1.1:** Movement of atoms in nucleus

### Conductors, semiconductors and insulators

**Conductors:** The materials that allow the flow of electrical current in one or more directions is known as conductor. A common electrical conductor is metal wire. Commonly used conductors include:

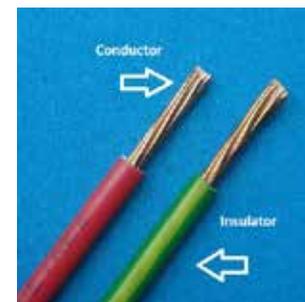
- Silver
- Aluminium
- Gold
- Cast iron
- Steel



**Fig 4.1.2:** Conductor

**Insulators:** It is a material whose interior electric charges doesn't flows easily, and therefore make it almost impossible to conduct an electric current under the influence of an electric field. Examples of insulators include:

- Rubber
- Nylon
- Plastic
- Porcelain
- Fibreglass
- Ceramic



**Fig 4.1.3:** Insulator

**Semiconductors:** These are hard chemical element or compound which can conduct electricity under some specific situations, this characteristic makes it a nice source for the control of electrical current.

Examples of semiconductors:

- Silicon
- Carbon
- Germanium

Mostly use of semiconductors is in transistors, computers, and other electronic devices.

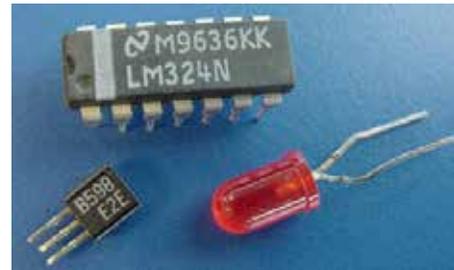


Fig 4.1.4: Semiconductor

**Movement of electrons through a conductor**

A positive charge (lack of electrons) is located on one end of the conductor and a negative charge (excess of electrons) is placed on the opposite end of the conductor, the following events occur if a source of power, such as a battery, is connected to the ends of a conductor. An imbalance of surplus electrons at one side of the circuit and a lack of electrons at the opposite side of the circuit is required for the flow of current.

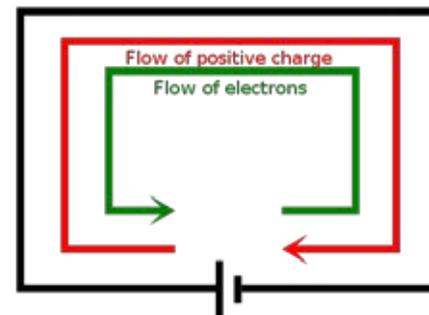


Fig 4.1.5: Movement of electrons in conductor

- The negative charge will repel the free electrons from the atoms of the conductor, whereas the positive charge on the opposite end of the conductor will attract electrons.
- As a result of this attraction of opposite charges and repulsion of like charges, electrons will flow through the conductor.

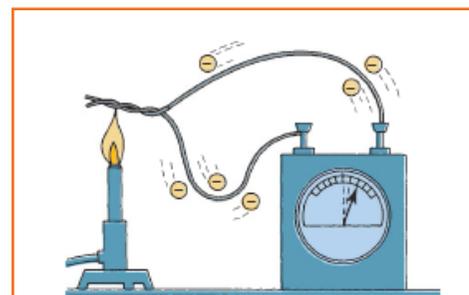


Fig 4.1.6: Generation of electricity by heat

**Sources of Electricity**

1. **Friction:** When different materials are rubbed together, the friction generates and causes electrons to be transformed from one to the other. Now both materials are in electrically charged state. These charges are not in motion, they deposited on the surface.
2. **Heat:** Thermoelectricity is defined as when pieces of two dissimilar metals are connected together at both ends and one junction is heated then the current

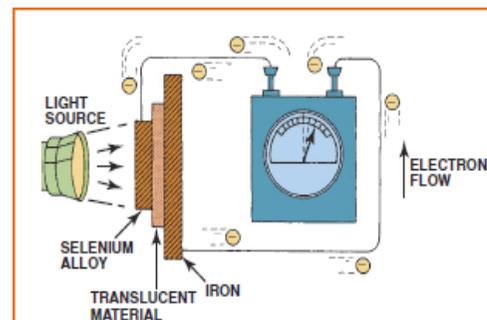
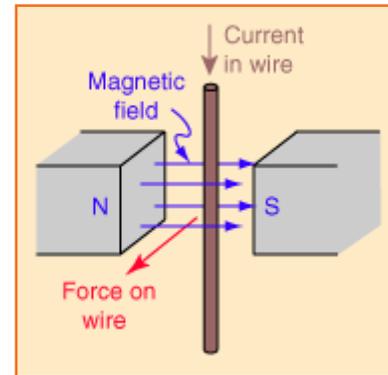


Fig 4.1.7: Generation of electricity by light

permits through the metals.

3. **Light:** The light energy is shifted to the free electrons of the metal when certain metals are exposed to light. This extra energy breaks the electrons free from the surface of the metal. Electrons can then be together and prepared to move in a conductor. Light-measuring devices such as automatic headlamp dimmers and photographic exposure meters used by this photo-electricity.
4. **Chemical:** A change is produced in potential or voltage when two dissimilar materials (usually metals) placed in a conducting and reactive chemical solution. It is the basis of the automotive battery and this principle is called electrochemistry.
5. **Magnetism:** If a conductor is moved through a moving magnetic field or a magnetic field near a conductor, electricity is created. This is the principle of how many automotive devices work, including:
  - Starter motor
  - Alternator
  - Ignition coils
  - Solenoids and relays



*Fig 4.1.8: magnetism*

## Ask

- You could ask the examples of conductors, insulators and semiconductors.
- You could ask direction of flow of electron the circuit.
- You could ask different sources of electricity.

## UNIT 4.2: Electric circuits and ohm's law

### Unit Objectives

At the end of this unit, students will be able to:

1. Understanding of electrical circuits and parts of a circuit
2. Understanding of Ohm's law
3. Understanding of different types of electrical circuit

### Resources to be Used

- Available objects such as a duster, pen, notebook, drawing tools etc.

### Do

- Welcome and greet the participants. Revise the learning's of the previous sessions and ask them if they have any doubts.

### Say

- A circuit is a complete path in which electrons travel from a power source (like battery) through a load like light bulb and then return back to the power source.
- It includes basic knowledge of engineering drawing and engineering drawing standards.

### Elaborate

A complete circuit contains following components:

- A battery is used as a power source
- Electrical circuit protection devices like fuses, circuit breakers, and fusible links are used for the protection from harmful overloads (excessive current flow).
- The flow of current from the power source to the resistance is defined as the power path.

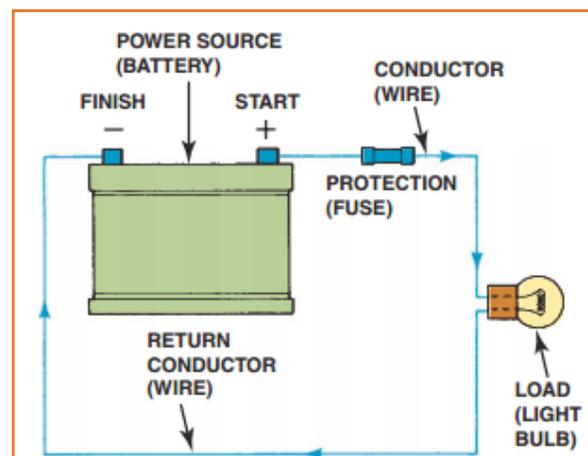


Fig 4.2.1: Electric circuit

- The electrical load or resistance which changes electrical energy into heat, motion, or light.
- The electrical current from the load back to the power source.
- Switches are used to turn the circuit on and off.

### Circuit faults

#### Open circuits:

It is a circuit that isn't complete, or lacks continuity, due to a damaged wire.

Following features are of open circuits:

- Through an open circuit no current will flow.
- If there is a break formed in the circuit, and then an open circuit may be created and saves the flow of current.
- The function of a fuse is to blow (open) when the current in the circuit surpasses the fuse rating. To stop any damage to the components or wiring as a outcome of the fault, the fuse will stops flow of current.

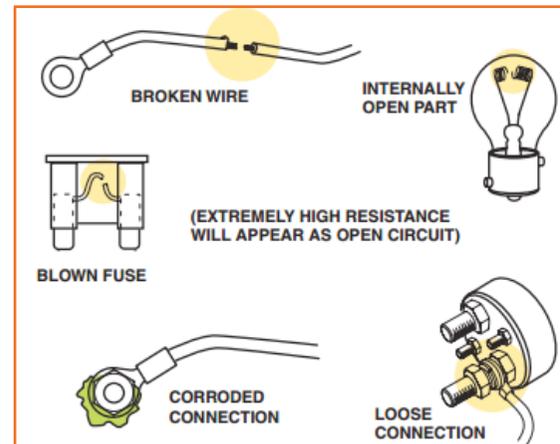


Fig 4.2.2: Open circuit

#### Short-to-voltage:

When the power side of one circuit is electrically joined to the power side of another circuit then a short-to-voltage occurs.

Following are the features of short circuit:

- A complete circuit in which the current generally bypasses some or all of the resistance in the circuit.
- The power side of the circuit is involved.
- A copper-to-copper connection (two power-side wires touching together) is involved.
- A fuse may or may not blow.

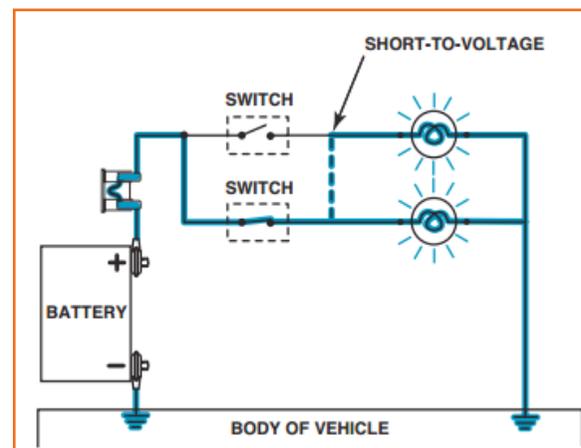


Fig 4.2.3: Short circuit

### Ohm's law

Ohm's law tell us that a current flowing in a close circuit has a direct relationship with the voltage given to that circuit and is inversely proportional to the resistance of that circuit, provided the temperature and physical condition is constant.

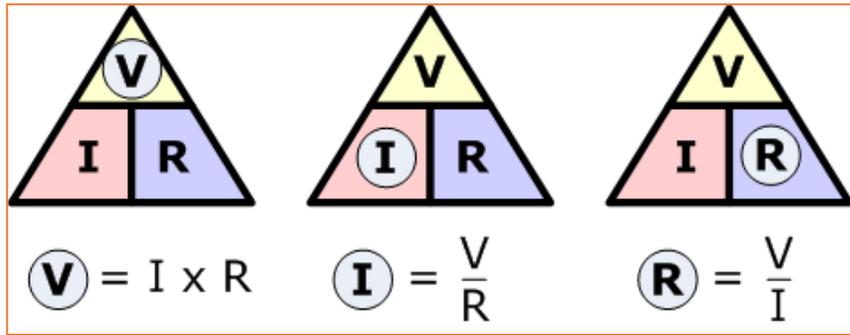


Fig 4.2.4: Ohm's law

If, for example, the current ( I ) is unknown but the voltage ( E ) and resistance ( R ) are known, then

Where,

- I = Current in amperes (A)
- E = Electromotive force (EMF) in volts (V)
- R = Resistance in ohms (Ω)

VOLTAGE	RESISTANCE	AMPERAGE
Up	Down	Up
Up	Same	Up
Up	Up	Same
Same	Down	Up
Same	Same	Same
Same	Up	Down
Down	Up	Down
Down	Same	Down

**Types of electric circuit**

**Series Circuit:** A series circuit is a circuit that has multiple loads and a single path to go through. Such as a circuit that is connected with a battery and three light bulbs.

$$I = \frac{V}{R_1 + R_2 + R_3}$$

**Parallel Circuit:** Like the series circuit, the parallel circuit passes through more than one load. However, the circuit gives the current more than one path to complete the circuit with. Since it has

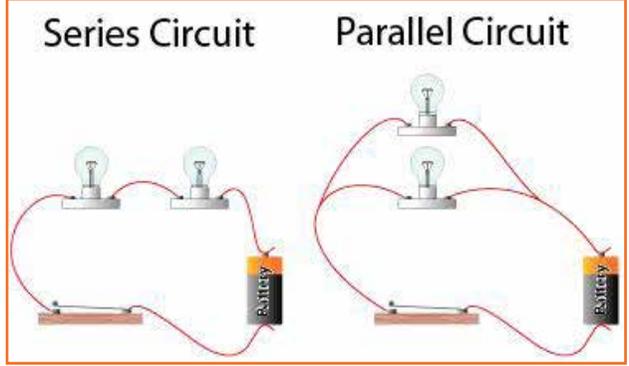


Fig 4.2.5: Series circuit and parallel circuit

multiple paths, the current will encounter less resistance by moving through all of the paths at the same time.

$$I = \frac{V}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$

**Series Parallel Circuit:** The type of circuit is a combination of both series and parallel. Electric current travels through both circuits.

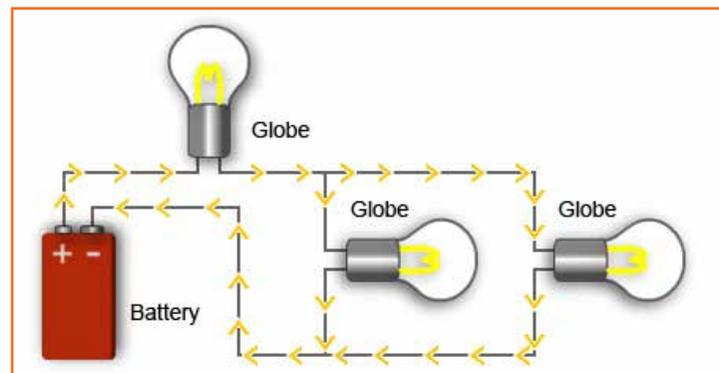


Fig 4.2.6: Series and parallel circuit

## Demonstrate



As shown in the figure below for example, if a battery contains 12 volts is joined to a resistor of 4 ohms, how many amperes will travel through the circuit?

To analyse the number of amperes that will travel through the wires and the resistor by the use of Ohm's law. Remember, the factor (amperes) can be analysed by using Ohm's law if two factors are known.

$$I = \frac{E}{R} = \frac{12V}{4\Omega} A$$

Here (I) is 3 amperes if voltage (E) is 12 Volts and the resistance (R) 4 ohms.

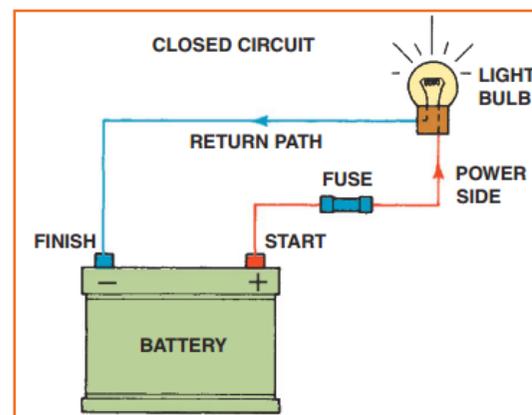


Fig 4.2.7: Ohm's law circuit

## Notes for Facilitation



- You could ask the students about different types of electrical circuits and their formulas.
- You could ask the students about the representation of series circuit and parallel circuit.
- You could ask the different components of electric circuit and their properties.

### Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Make series and parallel circuit and calculate the value of resistance of the circuit	2 hours	Battery Ammeter Voltmeter Light bulb Wires and connectors

### Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.





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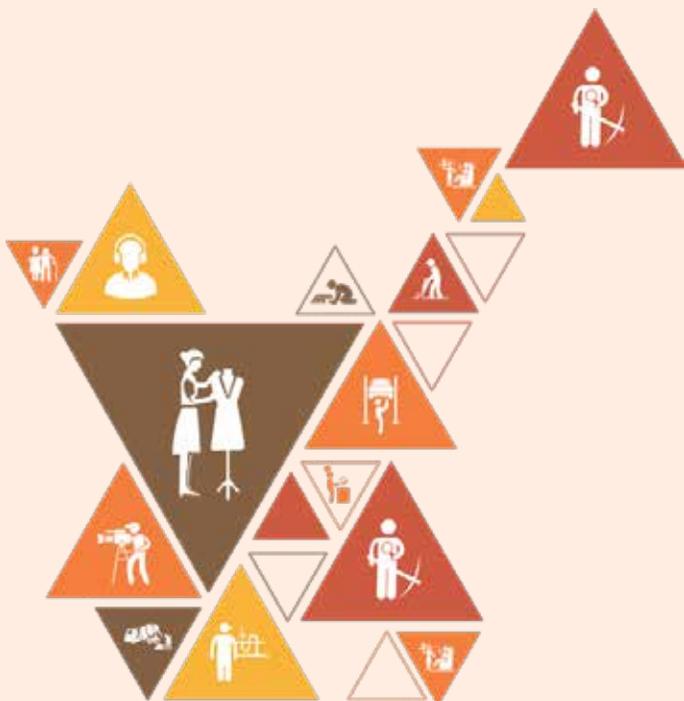
# 5. Electrical machines, hand tools and measuring instruments

Unit 5.1 - Recognition of electrical machines and their use

Unit 5.2 - Using of hand tools

Unit 5.3 - Using of measuring instruments

Unit 5.4 - Diagnosing the common defects of tools



**ISC/N1001**

## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Know about different types of machines and their use for fitter-electrician
2. Know about different types of tools require for different works
3. Know about use of hand tools
4. Know about use of measuring instruments
5. Know about how to calibrate instruments
6. Know about how to diagnose defects in tools

## UNIT 5.1: Recognition of electrical machines and their use

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Know about different electrical components require
2. Know about different electrical machines require and their use

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Resources to be Used

- Available objects such as a duster, pen, notebook, electrical machines etc.

### Say

- A fitter electrical assembly has to do setting-up or repair of electrical connections, getting the tools from store, handling over the tools and help in material handling and cleaning of work place before and after completion of job.
- Electrical wiring is required in almost every machine so the utility hand needs to be familiar with basic electrical components and equipments used in electrical fittings.
- An electrical fitter has to assemble and operate following machines:
  - Motor
  - Generator
  - Compressor
  - Pump
  - EOT crane operator
- An electric motor is an electrical machine that converts electrical energy into mechanical energy.

## 5.1.1: Understanding various electrical components

### Say



- Electrical wiring is required in almost every machine so the utility hand needs to be familiar with basic electrical components and equipments used in electrical fittings.
- Many electrical components like cables, switches, MCB's, fuse etc. are required for electrical machines fitting.

### Elaborate



#### The electrical components are:

1. **Cables:** Electric power is transmitted or distributed either by Overhead cables or by underground cables. Different types of electrical cables are used as per the current load that will pass through the cables.

#### Classification of cables

- a) Low tension (LT) cable – up to 1000V
- b) High tension (HT) cable – up to 11,000V
- c) Super tension (ST) cable – up to 33 KV
- d) Extra high tension (EHT) cable – 3 KV to 66 KV

#### Cable carrier and support

- The wiring cable can't be run or laid on walls without support.
- The wires need to be supported from the main distribution till the terminating product. The systems used to carry, support and run these wires are called cable carriers and support systems. Different systems are adopted for this purpose.

2. **Switching and terminating products**

The major terminating and switching products are house wiring cables normally terminate in:

- Switches (All types)
- Sockets
- Ceiling roses
- Holders and adaptors etc.



**Fig 5.1.1:** Electrician equipments

All these products have certain common features like insulation bases and covers.

a) **Switches:** Switches are classified as under:

- According to the rating – 6 A, 10 A, 16A
- According to the connection – 1 way, 2 way and intermediate

b) **Sockets:**

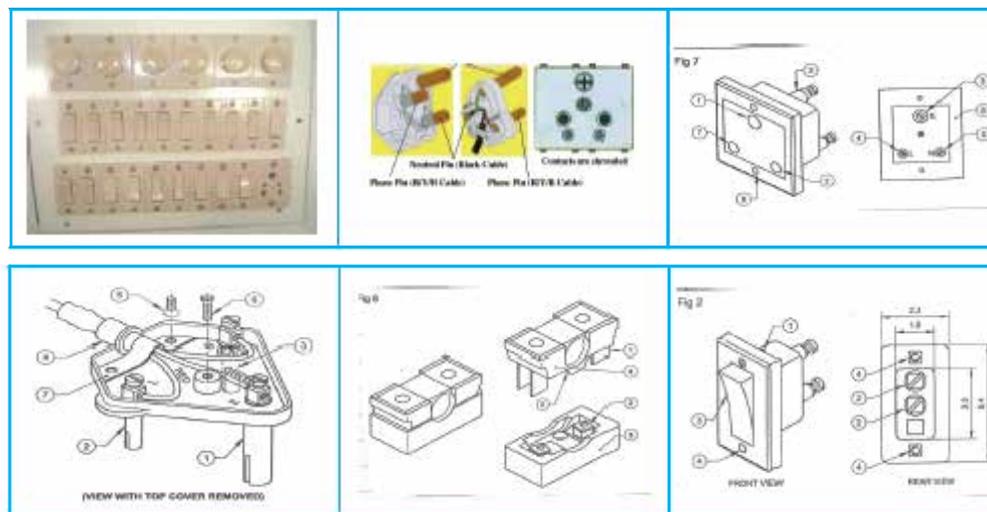
- According to the rating: 6A, 10A, 16A, 25A etc.
- According to the connection: 2 pin, 3 pin, 5 pin, multi pin etc.

c) **Ceiling Roses:**

- The wiring from switch terminals is taken to ceiling roses, lamp holders and connectors.
- The ceiling roses are available in two types. These are 2 pin and 3 pin.

d) **Holders and Adaptors:** There are some other terminating products named as holder and adaptors. Different holders are available in the market:

- Angle Holder
- Batten Holder
- Pendant Holder
- Screw type / Pin type Holder etc.



**Fig 5.1.2:** Holders and adaptors

3. **Cut outs:** In electrical distribution, a fuse cut-out is grouping of switch and fuse, which can be utilized in main overhead lines and protects distribution transformers from current surges and overloads. If any fault caused in transformer due to over-current, will melt the fuse and disconnect the transformer from the line. Linemen can open it manually while standing on the ground or by using a long insulating stick.



**Fig 5.1.3:** Fuses and MCB's

### Ask

- Why the electrical wiring is required?
- What is known as cable carrier and support system?
- Explain the name of switching and terminating product?
- What are the types of Ceiling rose?
- Name the different holder which available in the market?

### Notes for Facilitation

- Explain the electrical components along classification?
- What is the classification of cables?
- You could ask about the Hot stick?

### 5.1.2.1: Electric motor

#### Say

- An electric motor converts electrical energy into mechanical energy.
- An electric motor functioning depends upon the interaction between motor magnetic field and winding current.
- When an energized rectangular coil is placed in magnetic field, then a torque generates in the coil and rotates the coil continuously. When the coil of the electrical machine rotates, the shaft attached to it rotates and do the mechanical work.
- Electric motor has several parts like armature, commutator, brushes etc.

#### Elaborate

##### Construction - Parts of a electric Motor

- **Armature** - An electric motor consists of an insulated copper wire rectangular coil which is wound on a soft iron core and forms the armature. The rectangular coil is placed over an axle and among the cylindrical concave poles of magnet.
- **Commutator** - A commutator reverses the direction of flow of current. Commutator is made of copper ring which is split into two parts name as C1 and C2. The copper split rings are insulated from each other and fixed over the motor. Commutator rings in the motor are linked to a battery and the wires from the battery are connected to the brushes which are connected with the rings, not to the rings directly.
- **Brushes** - Brushes are small strips of carbon, which are connected with the commutator split rings. These carbon brushes are joined to the D.C. source and split rings revolve between the brushes.

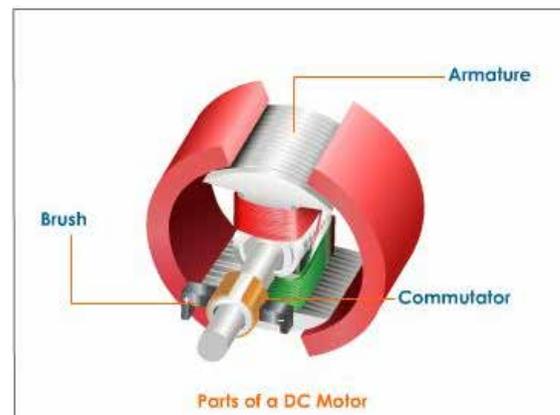


Fig 5.1.4: Electric motor

## Demonstrate

### Steps for working of motor

**Step 1:** When power is supplied to the coil, a magnetic field starts generating in the region of armature. The left side of armature starts moving away from the left magnet and drawn towards the right, this starts the rotation of coil.

**Step 2:** The coil turns at an angle of 90°, and then brushes lose contact with the commutator. When contact between brush and commutator loose, current stops flowing through the coil, but due to its momentum coil keeps turning.

**Step 3:** Now, coil turns at an angle of 180°, the sides of the brush get interchanged. Because of this, commutator ring C1 is now in contact with brush B2 and commutator ring C2 is in contact with brush B1. So, current keeps flowing in the similar direction.

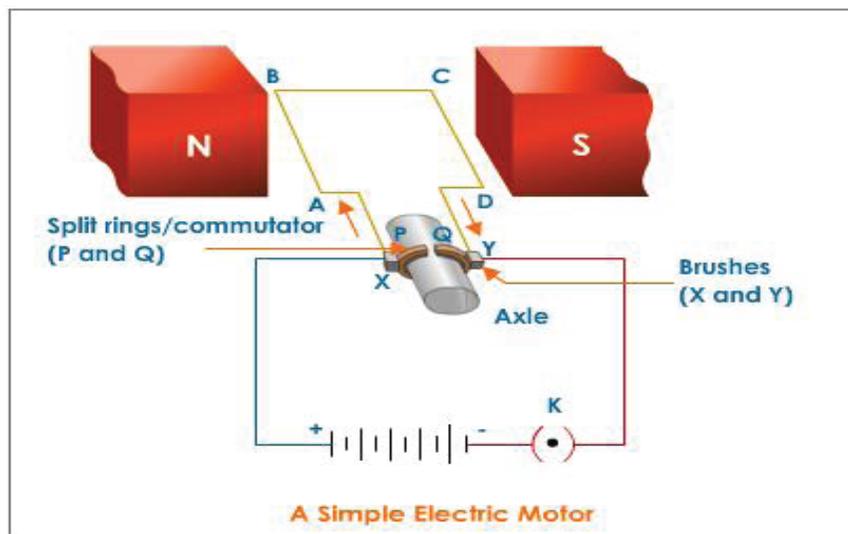


Fig.5.1.5: Working of motor

## Ask

- Ask the concept of Electrical motor?
- What is known as Brushes?

## Notes for Facilitation

- Explain the construction parts of Electric motor?
- Explain the use of Commutator?
- Explain the steps of working motor?

## 5.1.2.2: Electric Generator

### Say



- An electrical generator converts mechanical energy to electrical energy, using electromagnetic induction.
- Generators are helpful electrical machines; they provide electrical power during electricity shutdown and avoid disruptions in regular activities at work and home.
- Components of electric generator are yoke, pole, armature, brushes, winding, commutator etc.

### Elaborate



**The main components of an electric generator are as follows:**

1. **Yoke:** Yoke of DC generator is made of cast iron and serves two functions,
  - It holds the magnetic pole cores of the generator and acts as cover of the generator.
  - It carries the magnetic field flux.
2. **Pole of generator:** The pole coils are wound around the pole core. These are a simple coil of insulated copper wire, which placed over the pole.
3. **Armature of DC generator:** Armature core carries armature winding and provide low reluctance path to the magnetic flux. Since DC generator generates direct current but in the armature current generated is alternating in nature, this is the reason that armature is made of circular laminated sheets and in cylindrical shape.
4. **Field winding:** Armature windings are wound over the armature in form of flat rectangular coils.
5. **Commutator:** The commutator is an essential component of dc generator. It collects current coming from armature and pass to the load in form of direct current.
6. **Brushes of generator:** The brushes are made of carbon. Their shape is in rectangular block. They collect current from commutator segments.
7. **Bearing:** In small generators, ball bearings are used and in heavy duty dc generator, roller bearings are used. Always lubricate the bearing properly for smooth operation and longer life of machine.

**How does a generator work?**

- An electric generator converts input mechanical energy into electrical energy as the output.

- A generator does not actually generate electrical energy; it uses the mechanical energy supplied to it and forces the movement of electric charges. This flow of electric charges generates electric current which is supplied by the generator.

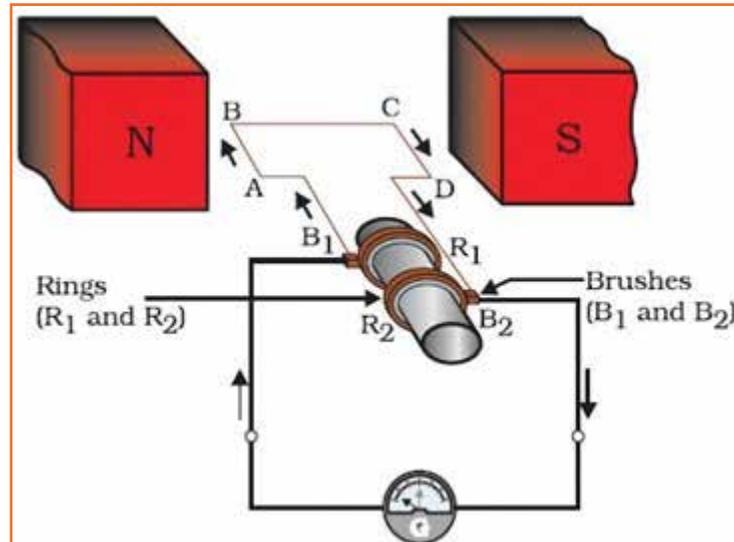


Fig.5.1.6: Working of generator

### Ask



- What is known as Electric Generator?
- What are the purposes of Yoke of DC generator?
- What are the functions of Brushes of DC generator?

### Notes for Facilitation



- Explain the construction parts of Electric motor?
- Explain the use of Commutator?
- Explain the steps of working motor?
- Explain how the generator works does.

### 5.1.2.3: Pumps

#### Say



- A pump moves or sucks fluids whether liquid or gas by some mechanical action. Pumps perform mechanical work in form of moving fluid when starts by an electric power.
- There are many types of pumps like vaccum pumps, water pumps, trash pumps, hydraulic pumps are available in market for different purposes.

#### Elaborate



##### Basic types of pumps

1. **Vacuum Pumps:** Vacuum pumps expel the gas from a sealed volume of gas leaving partial vacuum behind.
2. **Water Pumps:** Water pumps pump water. They pump water from the ground and used in pressure tanks within the location.
3. **Trash Pumps:** Trash pumps are used to pump wastewater. They are usually used to pump bathroom waste for disposal.
4. **Hydraulic Pumps:** These pumps are utilized in hydraulic drive systems. These pumps come in hydrostatic or hydrodynamic type.

#### Ask



- What is known as Pump?

#### Notes for Facilitation



- Explain the basic types of Pumps?

### 5.1.2.4: Compressors

#### Say



- A compressor compresses fluids
- Gas compressor compresses gas
- Air compressor compresses air

#### Elaborate



##### **Compressors are of two types:**

- Gas compressor is a device used to pressurize fluids
- Air compressor is a device used for compressing air to give power to other tools.

##### **Gas compressors**

Compressors are similar to pumps; they increase the pressure of a fluid and move the fluid through a pipe. Compressor also reduces the volume of a gas which is compressible in nature

Gas compressors are used in various applications where either high pressure or lower volumes of gas are required:

- Petroleum refineries, natural gas processing plants and similar big industrial plants.
- Refrigeration and air conditioner use compressors to move heat in refrigerant cycles.
- Gas turbine systems use compressors to compress the intake combustion air.
- Compression of less volume manufactured gases needed to fill up high pressure cylinders for welding, medical and other uses.
- Many industrial and manufacturing processes require compressed air for energizing pneumatic tools.
- Compressed air is also utilized in auto repair workshops to fill up power pneumatic tools and pneumatic tires.

**Air compressors**

An air compressor converts electric power into potential energy stored in pressurized air. It forces maximum air into a storage tank and this increases the pressure. When pressure of tank attains its upper limit then it stops working. The energy of the compressed air is used in various applications. After utilization, depressurize the tank and when pressure reaches its lower limit, the air compressor starts again and start re-pressurizing the tank.

Air compressors are used in various applications:

- It supplies high pressure clean air for filling gas cylinders
- It supplies moderate pressure clean air to immersed surfaces
- It supply moderate pressure clean air for driving pneumatic HVAC control system valves
- Supply moderate pressure air to power pneumatic tools, like jackhammers

**Ask**

- What is known as Gas compressor?
- What is known as Air compressor?

**Notes for Facilitation**

- Explain the different types of Compressors?
- Explain the uses of gas compressor in different applications?
- Explain the uses of Air compressor in different application?

### 5.1.2.5: EOT Cranes

#### Say



- An **overhead crane** is a bridge type of crane mostly found in large scale manufacturing industries. It consists of parallel runways with a traveling bridge.
- A hoist is lifting part of the crane which travels all along the bridge.
- Hoisting is dangerous, so for safe hoisting, safety precautions are necessary.

#### Elaborate



##### Operation of crane

1. Before operation, check all parts are lubricated properly and electrical wiring is done according to the electrical wiring diagram.
2. Check that limit switches are cutting off the motor supply in appropriate direction. If they are not cutting off the supply, make the necessary changes in wiring.
3. Commence lifting the load in stages, start it with load which is not more than 5% of the safe working load & then increase the load in gaps for safe working, till you have reached the full load.

##### Safe hoisting practices

- Do not load beyond the rated capacity. Overloading can cause the defects and make failure in future.
- Do not use it for handling personnel.
- For signs of wear and damage regularly do the visual inspection of crane.
- Don't utilize hoisting chains or cables as a alternate for slings.
- Stand clear of all loads
- Use limit switches during emergency conditions. Don't be tripped it during normal operation.
- Make sure that the hoist rises up & lowers down appropriately by operating the push buttons on control ropes.
- Before lifting, always centre the hoist over the load – don't do side pulling or end pulling.
- Do not leave the load suspended in the air unattended.

##### Applications

- Overhead cranes are usually used in the handling of steel and other metals like aluminium, copper etc. In manufacturing process, till the finished product in the factory, it is lifted by crane.

- In steel plants, pouring of raw material into furnace is done by crane. After metalworking process material is moved by an overhead crane for cooling.
- Lift the finished coils onto trucks and trains by overhead crane.

**Ask** 

- What is known as Bridge crane?

**Notes for Facilitation** 

- Explain the operation of crane?
- Elaborate the safe hoisting practices?
- You could ask about the application of crane?

**Activity** 

- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Operate electrical machines

Skill Practice	Time	Resources
Operating electrical machines	2 hours	Motor Generator Pump

**Do** 

- Ask them to get practice the activity in pairs.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

## UNIT 5.2: Using of hand tools

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Discuss about different hand tools
2. Know about how to use tools properly

### Resources to be Used

- Available objects such as a duster, pen, notebook, hand tools etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- Spanners are used to apply a twisting force (torque) to tighten or release a nut, bolt or threaded fasteners.
- Hammers are more suitable as the force of the blow is distributed over a larger area and any stretching of the metal is reduced or even eliminated.
- Files are one of the most important and most frequently used of the fitter's hand tools.
- The screwdriver is a driving tool with a blade fitted to a handle. The tip of the blade is shaped to fit in to the head of a screw and, when turned, will either tighten or loosen the screw.
- Ammeter and voltmeter are used to measure the current and voltage value in the circuit

### Do

- Show all the tools to the students.
- Demonstrate the use of tools.
- Explain the use of tools.

Elaborate 

TOOL	USAGE	IMAGE
<p><b>Screwdrivers</b></p>	<p>Screw driver is a tool used for driving in or removing a screw. To use a screwdriver:</p> <ul style="list-style-type: none"> <li>• Choose the correct size and tip of the screw driver, so that it fit into fastener’s head easily.</li> <li>• If required make a starter hole by drill or pressing the tip into object.</li> <li>• Insert tip of screwdriver into the screw head and turn its handle clockwise direction, then apply pressure over the handle so that tip can inserted into the handle properly.</li> <li>• Continue turning the screwdriver firmly and check that that screw is in straight position while inserting in the material.</li> </ul>	
<p><b>Pliers</b></p> <ul style="list-style-type: none"> <li>• Combination</li> <li>• Slip joint</li> <li>• Side cutters</li> <li>• Long nose</li> </ul>	<p>Pliers are used for gripping, twisting and cutting wires. To use pliers:</p> <ul style="list-style-type: none"> <li>• Determine the type of pliers required.</li> <li>• Make any adjustments if required for slip joint</li> <li>• Adjust locking pliers before using.</li> <li>• Press the handles of plier and close its jaws for holding the object.</li> <li>• To turn the object, rotate the tool as required.</li> <li>• Keep the fingers away from the jaws for safety.</li> </ul>	
<p><b>Hammers</b></p> <ul style="list-style-type: none"> <li>• Ball peen hammer</li> <li>• Engineers hammer</li> <li>• Soft faced</li> <li>• Rubber mallet</li> <li>• Dead blow</li> <li>• Brass</li> <li>• Leather</li> </ul>	<p>Hammers are used to drive nails, fit parts, forge metal, and break apart objects. To use a hammer:</p> <ul style="list-style-type: none"> <li>• Select the weight of the hammer appropriate to the fastener to be struck.</li> <li>• Make tight grip at the hammer handle lower half, then swing the hammer slowly and hit the fastener head squarely.</li> <li>• Do not strike your hand by the hammer head or handle.</li> <li>• Wave the hammer with extra power to strike the fastener head.</li> <li>• Continue the process of striking the fastener head to drive it into the material.</li> </ul>	

<p><b>Hacksaws</b></p>	<p>A hacksaw is a fine-toothed saw for cutting metal, plastic and wood. To use a hacksaw :</p> <ul style="list-style-type: none"> <li>• Install a blade by turning the adjuster on the handle or frame until spigots inserted properly in the holes at each end of the blade.</li> <li>• Ensure that blade teeth are pointed in opposite direction from the handle.</li> <li>• Tight the adjuster.</li> <li>• Gently fix object in the vice has to be cut.</li> <li>• Place the saw's central teeth on the object line have to be cut and then make the stroke on the line by pushing the saw.</li> <li>• Continue the cut and ensure that end of the object has been cut by the saw, cannot break due to unsupported weight.</li> <li>• Keep hands away from the blade teeth for safety.</li> </ul>	
<p><b>Files</b></p> <ul style="list-style-type: none"> <li>• Flat</li> <li>• Half round</li> <li>• Triangular</li> <li>• Knife edge</li> <li>• Round</li> <li>• Square</li> <li>• Half</li> </ul>	<p>Files are used to remove the burrs and sharp edges on the work piece created while sawing and drilling. For finishing a project, use of file is the first step.</p>	
<p><b>Chisel</b></p> <ul style="list-style-type: none"> <li>• Flat Chisel</li> <li>• Side Cut</li> <li>• Cow Mouth</li> <li>• Round Nose</li> <li>• Diamond Point</li> <li>• Cross Cut</li> </ul>	<p>Chisel is used for cutting rods, sheet metal and other workpieces of same type. The flat chisel is the used widely. It has a broad cutting edge which is slightly round in shape so that corners of chisel do not stuck inside the metal.</p>	

<p><b>Threading Tools</b></p> <ul style="list-style-type: none"> <li>• Round Solid Die</li> <li>• Round Split Die</li> <li>• Adjustable Die</li> <li>• Die Nut</li> <li>• Die Plate</li> <li>• Pipe Die</li> <li>• Chaser Die</li> <li>• Acorn Die</li> </ul>	<p>The process of creating screw threads is called threading. Taps and dies are the tools for this purpose. A tap is used to cut or form the nuts and this process of cutting or forming threads is called tapping. A die is used to cut or form the bolts and this process is called threading. You can also use both tools to clean up a thread and this process is called chasing.</p> <p>Threading tools comprise taps, thread cutters, thread-milling cutters, threading heads, threading dies and thread cutting abrasive disks.</p>	
<p><b>Grinding</b></p> <ul style="list-style-type: none"> <li>• Hand Grinder</li> <li>• Bench Grinder</li> <li>• Portable Grinder</li> <li>• Wet Grinder</li> <li>• Special Grinder</li> </ul>	<p>A grinding machine/grinder, is a tool used for grinding, using an abrasive wheel as the cutting tool. Every teeth of abrasive on the wheel's surface make cuts a on the work piece by shearing process.</p> <p>Grinding is used to finish work pieces to give them high quality of surface and accuracy in shape and dimension.</p>	
<p><b>Drills</b></p>	<p>A drill is a tool attached with drill bits for drilling a hole for fastening various materials together with the use of fasteners. Use chuck for gripping the attachment at one end of the drill and then rotated it.</p>	
<p><b>Pipe Wrench</b></p>	<p>The pipe wrench is an adjustable wrench used for turning soft iron pipes and fittings. Its adjustable jaws design permits it to lock in the frame in a way that if any forward pressure applied on the handle it pulls the jaws together. Its teeth are angled in the direction of turn which is digging into soft pipe. Don't use them on hard steel hexagonal nuts because they can damage the nut head. It can also be used to break the bolt.</p>	

<b>Try Square</b>	<p>Try square is a tool used to check and mark right angles in constructional work.</p>	
<b>Scriber</b>	<p>A scriber is a hand tool to mark lines on work pieces, prior to machining and this process is called scribing.</p>	
<b>V Block</b>	<p>V-Blocks are precision metalworking jigs usually used to grip round metal rods or pipes during drilling and milling work. They are made of a rectangular steel or cast iron block with a 90-degree channel rotated 45-degrees from the sides and form a V-shaped look in the top. A small groove is cut in the bottom of the "V". They have the screw clamps for holding the work.</p>	
<b>Divider</b> <ul style="list-style-type: none"> <li>• Simple Firm Joint Divider</li> <li>• Firm Joint</li> </ul>	<p>Dividers are drawing instruments that are used to measure distances, transfer lengths from one drawing to another and draw circles.</p>	

<p><b>Punch</b></p> <ul style="list-style-type: none"> <li>• Dott Punch</li> <li>• Prick Punch</li> <li>• Bell Punch</li> <li>• Hollow Punch</li> <li>• Double end Punch</li> <li>• Center Punch</li> <li>• Solid Punch</li> <li>• Pin Punch</li> </ul>	<p>A punch tool is used to assist in drilling. They are the marking tools, used for marking purpose into wood, plastic or metal for marking the area to be drilled. The conventional center punch is used with a hammer to make the groove on the surface.</p>	
<p><b>Snip</b></p> <ul style="list-style-type: none"> <li>• Straight Snip</li> <li>• Bend Snip</li> </ul>	<p>Snips are also known as shears and used to cut sheet metal and other tough objects.</p>	
<p><b>Scraper</b></p>	<p>Scraper is a single-edged tool used to scrap metal from a surface. It is required where a surface needs to be scratched and to be fit into its mating part.</p>	
<p><b>Bench vises</b></p>	<p>Bench vise is used to hold an object and makes the work easier to be performed on it. It is a reliable way to hold a piece of stock in place while working. It has two parallel jaws, one fixed and the other movable can move in and out by a lever.</p>	
<p><b>Tongs</b></p> <ul style="list-style-type: none"> <li>• Flat Open Mouth Tong</li> <li>• Flat Close Mouth Tong</li> <li>• Pick-up Tong</li> <li>• Bolt tong</li> </ul>	<p>Tongs are used to grip and lift objects.</p>	

<b>Wire Brush</b>	<p>Steel wire brushes are used to remove paint, dirt, rust, scratches and small imperfections after completion of work. They can be used on metal, concrete and wood surfaces. They come in many different wire types and sizes. Rigid brushes are used for clearing heavy dirt whereas soft brushes are used to make the surface shinier.</p>	
<b>chain block</b>	<p>Chain hoist is used for lifting heavy items. This handy machinery uses a system of levers and pulleys to hoist things off the ground. It also incorporates a heavy duty chain.</p>	
<b>Regulator</b> <ul style="list-style-type: none"> <li>• Signal stage Regulator</li> <li>• Double Stage Regulator</li> </ul>	<p>Single-stage pressure regulators decrease cylinder pressure in one step. Two-stage pressure regulators decrease cylinder pressure in two steps.</p>	
<b>Pipe Fitting</b> <ul style="list-style-type: none"> <li>• Pipe Adapters</li> <li>• Bulkhead Fittings</li> <li>• Compression Fittings</li> <li>• Pipe Cap</li> <li>• Pipe Elbow</li> <li>• Pipe Plug</li> <li>• Pipe Fasteners</li> <li>• Pipe Flanges</li> </ul>	<p>A fitting is used to connect straight pipe or tubing sections. They come in many different sizes and shapes.</p>	
<b>Testing Lamps</b>	<p>A testing lamp is used to diagnose and troubleshoot an electrical problem.</p>	

<p><b>Ampere Meter</b></p>	<p>It is used to measure electrical current in an appliance. To use it break the circuit and attach the instrument to allow the electrical current to flow through the meter for measuring.</p>	
<p><b>Volt Meter</b></p>	<p>Volt meter is used to measure AC or DC voltages of electrical components. Voltmeter is used to measure the voltage available in the circuit.</p>	
<p><b>Megger</b></p> <ul style="list-style-type: none"> <li>• Manual Megger</li> <li>• Electronic Megger</li> </ul>	<p>This device is used to measure electrical leakage in wire. It is used for checking the electrical insulation level of electrical machines and devices like motor, generator winding, etc.</p>	
<p><b>Pump</b></p>	<p>A pump moves fluids i.e. gases and liquids by some mechanical action. Pumps can be classified into three major groups as per their way of use: displacement, direct lift and gravity pumps.</p>	

**Ask** 

- You could ask about the details of tools used in an engineering workshop

## Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Demonstrate the proper use of tools

Skill Practice	Time	Resources
Use of tools	2 hours	All hand tools

## Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

## UNIT 5.3: Using of measuring instrument

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about different measuring instruments
2. Know about how to use measuring instruments properly

### Resources to be Used

- Available objects such as a duster, pen, notebook, measuring instruments etc.

### Ask

- You could ask the definition of Unit
- You could ask the body parts of a micrometer
- You could ask the different types of rules available
- You could ask the concept of vernier caliper
- You could ask the following concepts
  1. Height Gauge
  2. Feeler Gauge
  3. Dial indicators
- You could ask to explain the calibration process

### Notes for Facilitation

- You could ask about the SI unit of different physical quantities like length, mass, time etc
- You could ask how can the accuracy of a spirit level can be checked

### 5.3.1: Measurement

#### Say



- Measurement is the comparison of one quantity with standard quantity
- A unit of measurement is a definite magnitude of a physical quantity (length, Mass and Time).
- A unit of measurement is definite.

#### Ask



- You could ask the definition of Unit.
- Ask about systems of measurement.
- Ask about different types of units.

#### Elaborate



A unit of measurement is a definite magnitude of a physical quantity (length, Mass and Time). Example: 10 liter, 200 meter, 20 kg

However, now-a-days SI (International System of Units) is used across the globe as a standard system of measurement. It is an extension of MKS system of measurement.

S. No	Unit	Length (L)	Mass (M)	Time (T)
1.	C G S	Centimeter (cm)	Gram (gm)	Second (sec)
2.	F P S	Foot (ft.)	Pound (lb)	Second (sec)
3.	M K S	Meter (m)	Kilogram (Kg)	Second (sec)

SI system has 7 fundamental units and 2 supplementary units, there are a number of derived units.

S. No	Measuring	S I Units
1	Length	Meter
2	Mass	Kilogram
3	Time	Second

4	Intensity of Electric current	Ampere
5	Thermodynamic Temperature	Kelvin or degree Celsius
6	Quantity of substance	Mole

**Few Derived units in SI system are:**

S. No	Physical units	SI Units
1	Area	Sq. mtr
2	Volume	Cu.mtr
3	Speed	m/sec
4	Acceleration	m/sq sec
5	Density	Kg/cu.m
6	Force	Newton
7	Pressure	Pascal

### 5.3.2: Measuring instruments

#### Say



- A measuring instrument is a gadget for measuring a physical amount. In the physical sciences, quality confirmation and engineering, estimation is the movement of getting and contrasting physical amounts of certifiable items and events.
- Measuring instruments are classified into types:
  - o Precision instruments and
  - o Non Precision instruments
- Least Count shows the level of precision of estimation that can be accomplished by the measuring instrument.

#### Do



- Show different precision and non-precision instruments.
- Give the example of least count calculation.

#### Ask



- You could ask about precision instruments
- Ask about non-precision instruments

#### Elaborate



A measuring instrument is a gadget for measuring a physical amount. In the physical sciences, quality confirmation and engineering, estimation is the movement of getting and contrasting physical amounts of certifiable items and events. Set up standard articles and events are utilized as units, and the procedure of estimation gives a number relating the thing under review and the referenced unit of estimation. Measuring instruments, and formal test strategies which characterize the instrument's utilization, are the methods by which these relations of numbers are gotten. All measuring instruments are liable to shifting degrees of instrument mistake and estimation vulnerability.

### 5.3.2.1: Steel rule

#### Say



- Steel Rule is a flat and thin linear measurement instrument. It is the most commonly used measuring instrument.
- There are different types of rules available. Few commonly used are: Engineer's rule, Folding rule,
- Flexible rule & Hook rule

#### Do

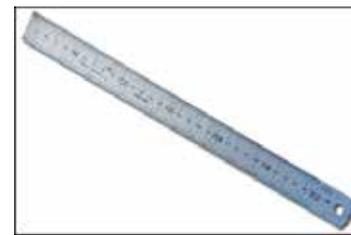


- Show different steel rules
- Demonstrate the use of steel rule

#### Elaborate



Steel Rule is a flat and thin linear measurement instrument. It is the most commonly used measuring instrument. Steel rule is manufactured from stainless steel. The edges of the rule are accurately ground to form straight edges. Steel rules are available in different sizes like 150 mm, 300 mm and 600 mm. usually; the reading accuracy is around 0.5 mm.



**Fig 5.3.1:** Steel rule

### 5.3.2.2: Vernier caliper

#### Say



- A Vernier Caliper is a precision measuring instrument used to measure inside and outside diameter of shafts and thickness of parts having accuracy of 0.02mm.
- The vernier calipers measure reading of the distance directly with precision and high accuracy. These calipers consist of calibrated scale with fixed jaw and movable jaw with a pointer.
- The Least Count of a Vernier Caliper can be calculated using the formula  $LC = 1 \text{ MSD} - 1 \text{ VSD}$  (Value of one Main Scale Division - Value of one Vernier Scale Division).

#### Do



- Show vernier caliper.
- Show the parts of vernier caliper.
- Demonstrate how to take the reading from vernier caliper.

#### Elaborate



For using vernier caliper, move the position of the pointer on the scale. At the point where the pointer is between two markings, take the reading on the scale. This is basic caliper; expansion of vernier scale on the instrument gives more exact reading; this is the vernier caliper.

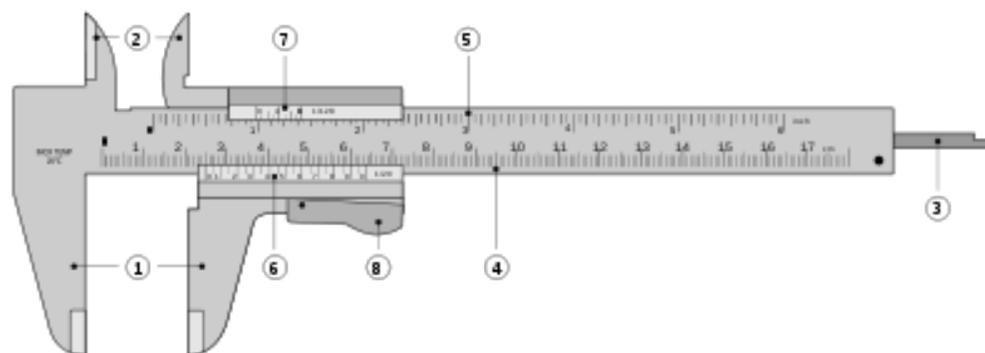


Fig 5.3.2: Vernier caliper

#### Parts of a vernier caliper:

1. **Outside Jaw** - To measure outer dia. and width of an object.
2. **Inside Jaw** - To measure inner dia.
3. **Depth Probe** - To measure depth of an object.

4. **Main Scale** - Scale set apart in millimeter (mm)
5. **Main Scale** - Scale set apart in inches
6. **Vernier Scale** - Interpolated estimations in millimeter
7. **Vernier Scale** - Interpolated estimations in millimeter
8. **Retainer** - Used to lock movable parts

## Demonstrate



- Explain the parts of vernier caliper.
- Demonstrate how to do measurement from vernier caliper

## Steps: Using vernier caliper



- Step 1.** First loose the locking screw of caliper and check the vernier scale for its proper working by moving the slider and ensure that caliper is reading 0 when closed fully. If you find caliper is not showing 0 reading, then adjust the jaws of caliper till that you get a 0 reading. If it is not adjusting at 0 reading, then add or subtract the correct offset in final reading for getting 0 reading.
- Step 2.** Close the jaws delicately on the object which need to be quantify (For instance a round steel ball).
- Step 3.** The primary metric scale is perused first and for instance says this demonstrates there are 13 entire divisions before the 0 on the hundredths scale. Thusly, the main number is 13.
- Step 4.** The 'hundredths of mm' scale is then perused. The most ideal approach to do this is to tally the quantity of divisions. This is 21 divisions on the hundredths scale.
- Step 5.** Then 21 is multiplied by 0.02 giving 0.42 as the appropriate response (every division on the hundredths scale is comparable to 0.02mm).
- Step 6.** The 13 and the 0.42 are included to give the last estimation of 13.42mm (the diameter across of the bit of round area steel).

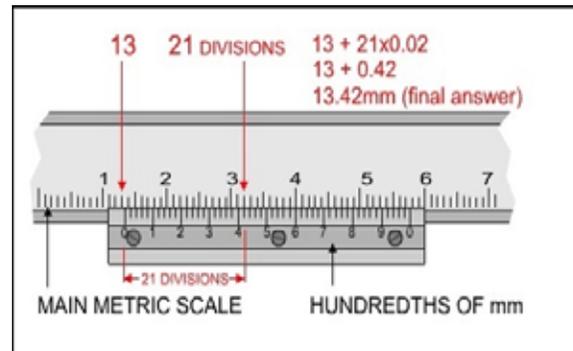


Fig 5.3.3: Reading vernier caliper

## Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.

- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using vernier caliper

Skill Practice	Time	Resources
Using vernier caliper	2 hours	Vernier caliper
		Any object for measurement

**Do** 

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

### 5.3.2.3: Micrometer

**Say** 

- A micrometer is a device incorporating a calibrated screw widely used for precise measurement of component in mechanical engineering and machining as well as most mechanical trades.
- Explain the body parts of a micrometer.
- Micrometers use the principle of a screw to amplify small distances (that are too small to measure directly) into large rotations of the screw that are big enough to read from a scale.

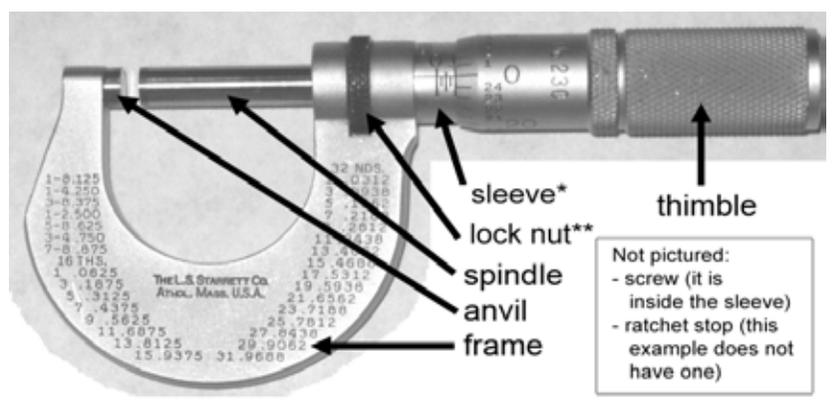
**Do** 

- Show micrometer.
- Show the parts of micrometer.
- Demonstrate how to take the reading from micrometer.

**Elaborate** 

A micrometer is a device incorporating a calibrated screw widely used for precise measurement of component in mechanical engineering and machining as well as most mechanical trades. They are used to measure very small distances.

**Body parts of a Micrometer**



**Fig 5.3.4:** Micrometer

- **Frame** - The C-shaped body that holds the anvil and barrel in constant relation to each other. It is thick because it needs to minimize flexion, expansion, and contraction, which would distort the measurement.

- **Anvil** - The shiny part that the spindle moves toward, and that the sample rests against.
- **Sleeve / barrel / stock** - The stationary round part with the linear scale on it.
- **Lock nut / lock-ring / thimble lock** - The knurled part (or lever) that one can tighten to hold the spindle stationary, such as when momentarily holding a measurement.
- **Screw** - The heart of the micrometer, as explained under “Operating principles”. It is inside the barrel.
- **Spindle** - The shiny cylindrical part that the thimble causes to move toward the anvil.
- **Thimble** - The part that one’s thumb turns.

## Demonstrate



- **Ratchet stop** - Device on end of handle that limits applied pressure by slipping at a calibrated torque.
- Explain the parts of micrometer.
- Demonstrate how to do measurement from micrometer.

## Steps: Using vernier caliper



The basic operating principles of a micrometer are as follows:

**Step1.** The amount of rotation of an accurately made screw can be directly and precisely correlated to a certain amount of axial movement (and vice versa), through the constant known as the screw’s *lead*. A screw’s *lead* is the distance it moves forward axially with one complete turn (360°).

**Step2.** With an appropriate lead and major diameter of the screw, a given amount of axial movement will be *amplified* in the resulting circumferential movement.

## Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using micrometer

Skill Practice	Time	Resources
Using micrometer	2 hours	Micrometer
		Any object for measurement

**Do**

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

### 5.3.2.4: Height gauge

#### Say



- A digital height gauge is precision measuring device used specifically for measuring height of two points.
- Advanced electronic (digital) height gauges can be used to carry out different tasks like measuring step heights, internal/external diameters and centre-line distances.

#### Do



- Show height gauge.
- Show the parts of height gauge.
- Demonstrate how to take the reading from height gauge.

#### Elaborate



The electronic height gauge has a precision of up to 0.0254 mm and claims consistency of  $\pm 0.00254$  mm. The conventional height gauges are similar to Vernier Callipers, except that the fixed jaw is shaped like a base. The scale is graduated on both sides, one side being graduated for internal measurement. The main scale for external measurement starts at 1 inch. This allows for the combined width of the base and movable jaw, when the jaws are in contact. The gauge can be converted into a form of scribing block (to mark the work piece) by attaching an extension arm, beveled to a sharp edge, to the movable jaw.

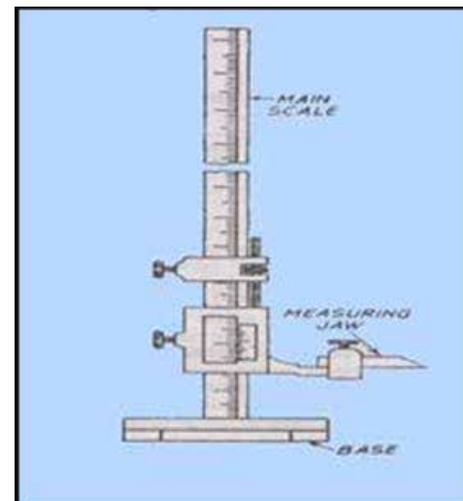


Fig 5.3.5: Height gauge

#### Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

- Do the measurement of given object by using height gauge.

Skill Practice	Time	Resources
Using height gauge	2 hours	Height gauge
		Any object for measurement

Do

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

### 5.3.2.5: Feeler gauge

#### Say



- A feeler gauge is a measuring tool used to measure gap widths. They are used to measure the clearance between two parts.
- They are made of number of small steel strips of different thicknesses with measurements marked on each piece.

#### Do



- Show feeler gauge.
- Show the parts of feeler gauge.
- Demonstrate how to take the reading from feeler gauge.

#### Elaborate



- Feeler gauges are flexible enough that, even if they are all on the same hinge, several can be stacked together to gauge intermediate values
- Feeler gauges are used for valve clearances, setting spark plug gaps and ignition point gaps in engines.
- Feeler gauges are generally available in Metric and Inch Grades.



Fig 5.3.6: Feeler gauge

#### Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using feeler gauge.

Skill Practice	Time	Resources
Using feeler gauge	2 hours	feeler gauge
		Any object for measurement

Do 

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

### 5.3.2.6: Dial indicator

#### Say



- Instruments use to measure small linear distances is called dial indicator. They are also known as dial gauges.
- Variation in tolerance of machined part can be checked by dial indicator.
- It's typical measurement range is 0.25 mm to 300 mm.

#### Do



- Show dial indicator.
- Show the parts of dial indicator.
- Demonstrate how to take the reading from dial indicator.

#### Demonstrate



- Explain the parts of dial indicator.
- Demonstrate how to do measurement from dial indicator.

#### Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Do the measurement of given object by using dial indicator.

Skill Practice	Time	Resources
Using dial indicator	2 hours	Dial indicator
		Any object for measurement

Do 

- Ask them to get practice the activity alone.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

### 5.3.3: Calibration of measuring instrument

#### Say



- Calibration includes establishing and documenting abnormality of the measured value from retraceable, extremely precise standards of inspection. During calibration, known value of instrument is compared with the measured value under specific conditions.
- Calibration does not involve any manipulation of the measuring instrument, which remains entirely unchanged.
- Permanently changes the measuring instrument by adjustment always involves manipulation.
- Retraceability of a calibration procedure means that the calibration order is reproducibly documented from the separate device under test. A country's metrological infrastructure defines retrace ability of measurement results.

#### Do



- Explain calibration process.
- Demonstrate how to check the calibration of measuring instrument.

#### Elaborate



This must be reviewed to national standards at regular intervals by means of calibration, and if needed adjust, and normally labeled with their calibration status. If it is determined during calibration that the measuring instrument doesn't fulfill the stated requirements, the operating company must examine the validity of before obtained measurement results and apply suitable measures with regard to the measuring instrument itself, as well as all affected products.

Throughout the calibration range of the instrument, calibration of an instrument is checked at several points. The upper and lower limit within which a quantity is measured is defined as the calibration range.

##### **Calibration process**

1. It starts with the design of measuring instrument which has to be calibrated.
2. The design of measuring instrument is like that it can hold the calibration process and calibration intervals within tolerance limits.

3. Design with following characteristics improves the life of instrument.
4. Selection of standards is the most visible part in calibration process.
5. The calibrated equipment has to be correct with the working standards.

There are some connections between calibrated device and standards, which can impact the process of calibration. For example, an analog phenomenon is involved in electronic calibrations; the result is directly influence by the impedance of the cable connections.

## UNIT 5.4: Diagnosing the common defects of tools

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Know about identification of defects in tools

### Say

- Management has to establish a system to check the condition of tools for any defect or damage on regular basis.
- If found tools are damaged and are not in a condition of repairing, then discard the complete tool on immediate basis from the work area.
- Defective tools can do severe and hurting injuries.
- **Check problems like:**
  - o Un-operative guards
  - o The on/off switch is not working properly
  - o Insufficient grounding of power tools
  - o No ground wire (on plug) in tools
  - o Wrong grinder wheel
  - o Cracked blade of tool
  - o Wedged back the guard on power saw

### Do

- To ensure safe use of hand tools, remember:
  - o Never use a defective tool
  - o Double check all tools prior to use
  - o Ensure defective tools are repaired
- Don't use power tools when they are defective in any way

### Ask

- You could ask about the points to be remembering to ensure safe use of hand tools.



# 6. Assembling and dismantling of common machines on the worksite

Unit 6.1 – Limits, fits and tolerances

Unit 6.2 – Understanding the engineering drawing

Unit 6.3 – Preparing equipment to perform the assembling of components

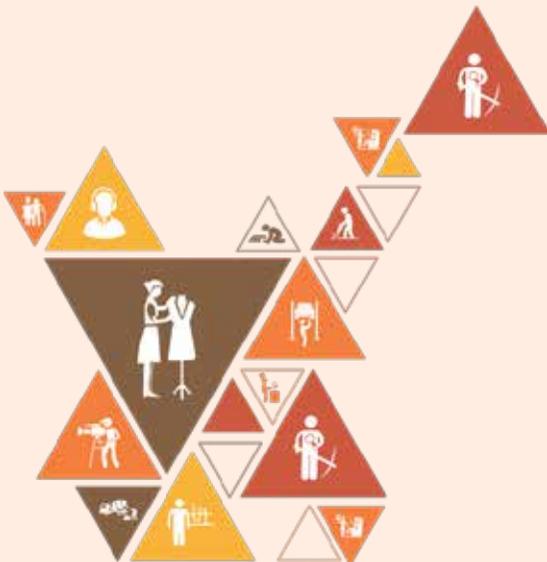
Unit 6.4 – Ensuring material appropriateness for assembly

Unit 6.5 – Proper identification of tools and tackles

Unit 6.6 – Correct handling of tools and tackles

Unit 6.7 – Jointing of components

Unit 6.8 – Machine installation and maintenance



## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Know about limits, fits and tolerance
2. Know about basics of engineering drawing
3. Know about how to understand engineering drawing sketches
4. Know about prepare pre-assembly activities
5. Know about identification of appropriate material for starting job work
6. Know about identification of appropriate tools for starting job work
7. Know about correct handling of tools
8. Know about how to perform housekeeping activities before starting the work
9. Know about maintaining safety at workplace
10. Know about limits, fits and tolerance

## UNIT 6.1: Limits, Fits and Tolerances

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Know about basic deviation, tolerance and tolerance grades
2. Discuss about transition fit, limits and system for limits and fits

### Resources to be Used

- Available objects such as a duster, pen, notebook etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- The most extreme and least permissible sizes inside which the actual size of a part lies are called Limits.
- Important terminologies of limit systems like limits of size, nominal size, basic size, deviation etc.
- When two sections are to be collected, the connection resulting because of the difference between their sizes before assembly is known as a fit.
- A fit can be divided into three classes: Clearance, interference and transition fit
- Standard System of limits and fits are hole basis system and shaft basis system
- Tolerance is the difference between maximum limit of size and minimum limit of size. It characterizes the permissible or limits in size variation.
- There are two types of tolerance- unilateral and bilateral tolerance
- Tolerance Size includes the basic size, the fundamental deviation and grade of tolerance.

## Elaborate



### Terminology of limit systems:

- **Limits of size:** The two maximum allowable sizes of a part between which the actual size should lie. It includes the maximum and least sizes of the part.
- **Nominal size:** Actual size of the component through which it is referred.
- **Basic size:** It is the part of a section in connection to which all points of variation are determined.
- **Zero Line:** It is the line in which places of resistance zones are appeared.
- **Deviation:** Deviation is mathematical difference between highest size and essential size
- **Upper Deviation:** Logarithmic difference between most extreme limit of size and relating fundamental size is upper deviation. It is meant by letters "ES" for a hole and "es" for a shaft.
- **Lower Deviation:** Mathematical distinction between the minimum limit of size and the relating essential size is lower deviation. It is meant by letters "EI" for hole and "ei" for a shaft.
- **Fundamental Deviation:** It is either upper or lower deviation, which is closest to the zero line for either a shaft or a hole. It settles the position of the resistance zone in connection to the zero line.
- **Allowance:** Allowance is intentional difference between hole measurements and shaft measurement for a fit.

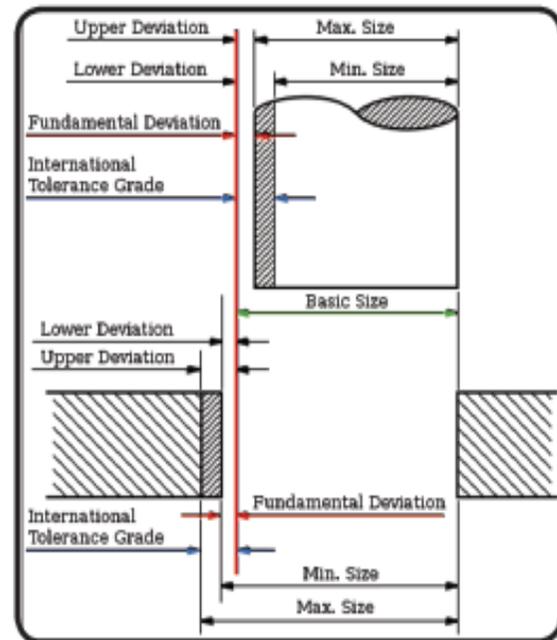


Fig 6.1.1: Limit system terminology

### A fit can be divided into three classes:

1. **Clearance:** It is the difference between size of the shaft and extent of the hole (it is constantly positive).
2. **Interference:** Difference between span of hole and shaft before get assembly is interference.
3. **Transition Fit:** It is a fit that some provides clearance and sometime interference.

### Types of Tolerance

- The tolerances are known as unilateral, when two measurements are on one side of the nominal size.
- When two limit measurements are above and beneath apparent size, the tolerances are said to be bilateral or two-sided.

## Ask



- You could ask the different terminologies of limit systems
- You could ask the meaning of Fit and its classes
- You could ask the meaning of Tolerance and its types.
- You could ask to calculate the tolerance. Given the hole is shown as  $25 \pm 0.2$

## UNIT 6.2: Understanding the engineering drawing

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Discuss about basics of engineering drawing
2. Know about orthographic projection views
3. Discuss about concept of quadrants
4. Know about engineering standards
5. Know about tools require for engineering drawing

### Resources to be Used

- Available objects such as a duster, pen, notebook, drawing tools etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- The reason for engineering drawing is to pass on graphically the thoughts and fundamental data for the development or examination of structures, machines or frameworks.
- It includes basic knowledge of engineering drawing and engineering drawing standards.

### Notes for Facilitation

- You could ask the students about the purpose of engineering drawing.

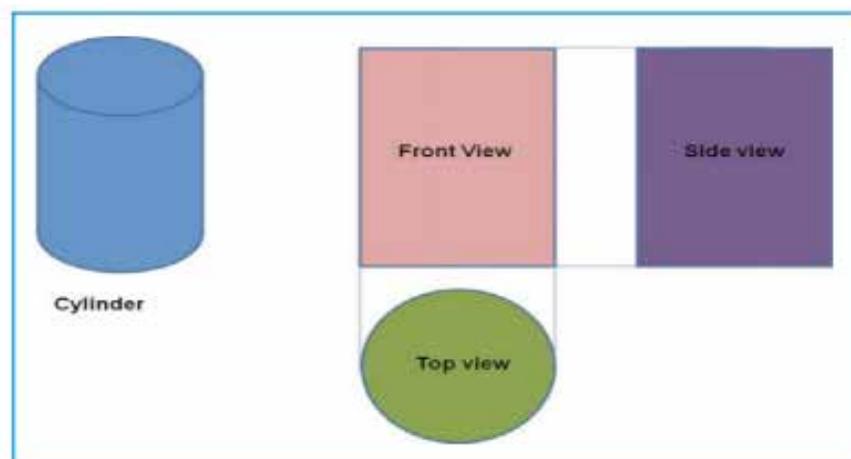
## 6.2.1: Basic knowledge of engineering drawing

### Say

- Engineering drawing a graphical language utilized by specialists and other specialized faculty related with this profession.
- In basic engineering drawing, orthographic projection method is used.
- Orthographic drawings are the establishment of technical and machine drawings.

### Elaborate

- The orthographic projection demonstrates the object like it views from the front, right, left, base, top or back, as per the projections in first-angle or third-angle projection. Third angle orthographic projection is standard projection for every single mechanical drawing.
- Orthographic projection is the technique for speaking to the correct state of an object in at least two perspectives, on projection planes commonly at right angle position to each other or by drawing perpendiculars from object to planes.
- For example: Orthographic views of a cylinder are



**Fig 6.2.1:** Orthographic views of cylinder

### Do

- Tell them about the orthographic projection and quadrants
- Show them the orthographic views
- Demonstrate them the first and third angle of projection

## Demonstrate

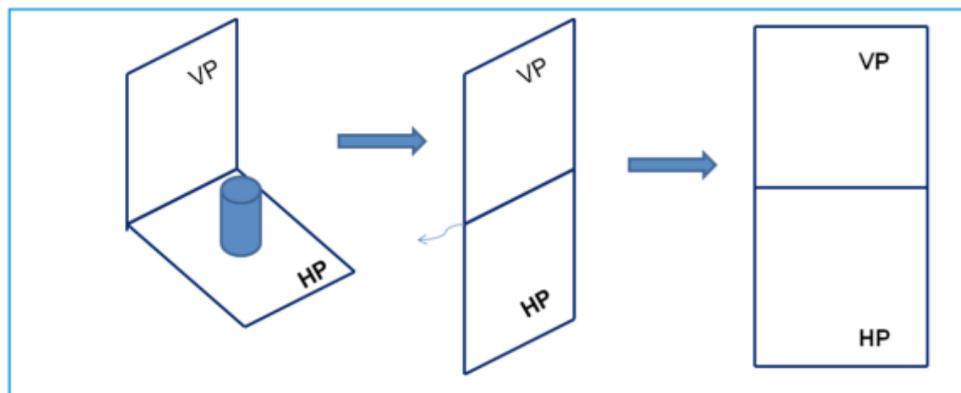
For basic engineering drawings; two guidelines are regularly being used in orthographic projection; the first angle projection also known as European projection and third angle projection also known as American projection. Perspectives are indistinguishable in both techniques for projection with the exception of their relative positions on the drawing paper. So, let's understand them:

### 1st angle Projection – Rotation of Planes

In 1st angle projection, the front view is reference VIEW and other views are drawn as “shadows” of that view. For example, the left hand side view is drawn on the right side of front view. So, the top view (plan) is drawn at the base of front view, and so on.

**Step 1:** Rotate the Horizontal Plane Clockwise through 90°.

**Step 2:** Rotate the planes clockwise through 90° to face the observer.



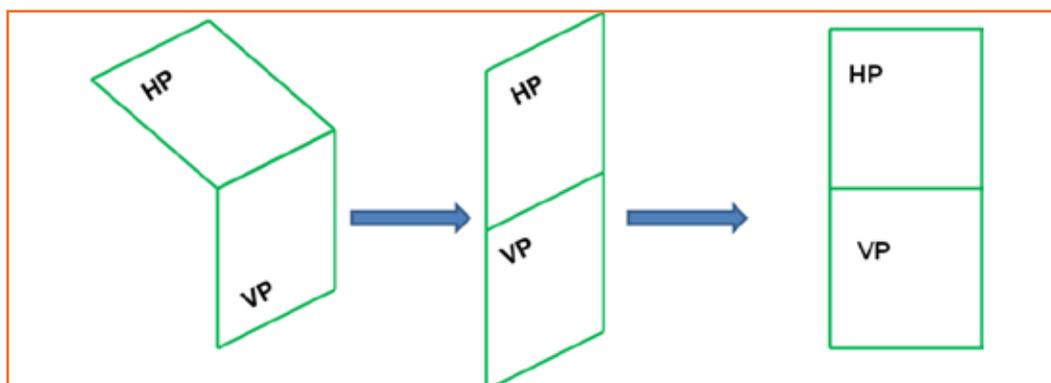
*Fig 6.2.2: Rotation of planes in 1st angle projection*

### 3rd angle Projection – Rotation of Planes:

In 3rd angle projection, the front view is the premise (similarly as before) however other views are drawn as “reflections” of front view. In this projection, the left hand side view is drawn on the left hand side of front view. Additionally, the top view (plan) is drawn over the front view.

**Step 1:** Rotate HP through 90° in the clockwise direction

**Step 2:** Rotate the planes through 90° in the clockwise direction to face the observer



*Fig 6.2.3: Rotation of planes in 3rd angle projection*

## Tips

For drawing technical drawings, some tips given are:

- **Visualize Object:** Visualize the definite and clear picture of object in mind, and then a decent graphical picture can be created.
- **Determine Views:** The perspectives might possibly be the same with respect to a scale drawing; e.g., the thickness or state of the line can be utilized to draw a view.
- **Determine Size:** Determine the size of sheet of paper for portraying the object. Size of the sheet should be enough to show all details the object, however permit a lot of space for measurements, notes, and particulars.
- **Locate Center Lines:** When going to start drawing, always locate the inside lines of object.
- **Block in Main Outlines:** Check the extents of width to height in drawing. Select one edge of the object as a unit and assess the proportionate lengths of alternate edges.
- **Complete Detail:** Once the primary blueprint is acceptable, fill the points of interest for right extent.
- **Dimension Lines and Arrowheads:** When the state of the object has been drawn completely, then include the measurement arrowheads and lines. Don't make any estimation until the work is finished.
- **Dimensions:** Now embed the measurements on the drawing. These measurements can be obtained by a steel cable. Take all estimations from completed surfaces.
- **Titles and Notes:** Titles and notes should be embedded together with the date mentioned on sheet.
- **Check:** Make a last check after completing the draw. Do it carefully.

## Ask

- You could ask what are the systematic order of application should be followed for both idea sketches and sketches from objects
- You could ask about the quadrants

## Notes for Facilitation

- You could ask why orthographic projection method is used.

## 6.2.2: Engineering drawing standards

### Say



- Engineering drawings, being one of the many types of specialized form of exchanging information, need to satisfy some acknowledged guidelines and ISO standards.
- ISO most prescribed paper sizes for specialized drawings are known as A-FORMATS.
- In technical drawings, various type of lines and line styles are used to provide the desired information.
- Dimensions express the appropriate sizes of features. Distances might be shown with either of two accepted forms of dimension: ordinate and linear.

### Elaborate



Distances might be shown with either of two accepted forms of dimension: ordinate and linear.

- In **linear dimensioning**, two parallel lines, also known as “extension lines,” separated at the distance between two components, which are shown at every element. A line perpendicular to the extension lines, known as “dimension line,” is appeared between and ending at the extension lines. The distance is shown in numerical form at the midpoint of the dimension line.
- In **ordinate dimensioning**, an origin is established between one horizontal and one vertical extension line for the complete object view. The small circles placed at the ends of these lines shows the origin of line. Measurements along the x- and y-axes are shown by these extension lines, with the distances written in numerical form at the ends of these lines.

**Typical standards of lines are summarized below.**

- Visible – these are sequential lines used to represent edges which can be seen directly from a specific angle?
- Hidden – these lines are used to represent edges which can't be seen directly.
- Center – These lines are used to represent the axes of circular features. These lines are long and short dashed.
- Cutting plane – are lines that used to define sections for section views, these are thin and medium dashed lines, or also thick, long and double short-dashed lines.
- Section – These are thin lines, represent section views which results due to cutting of object. These are also known as “cross-hatching.”
- Phantom – These lines indicates feature or component of the assembly which is not the described part or assembly. These lines are alternately long and double short-dashed thin in shape.

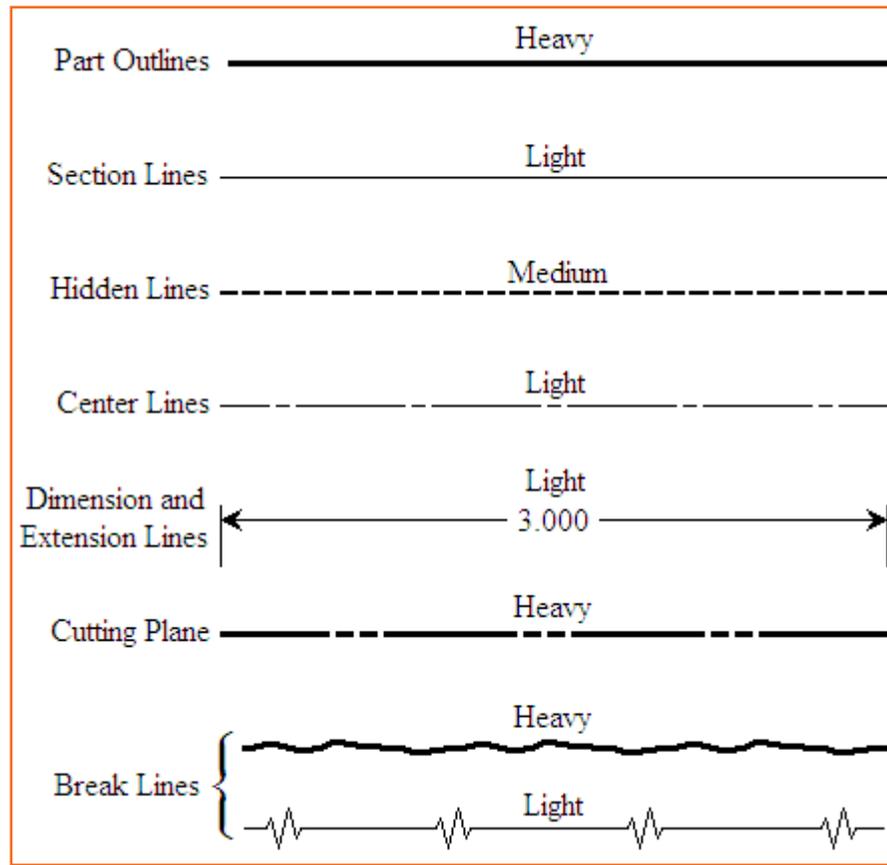


Fig 6.2.5: Different lines used in engineering drawing

### Ask



- You could ask the standardized form of dimension
- You could ask what are the Basic drawing tools and equipments dimensioning
- You could ask about the different lines used in engineering drawing

## UNIT 6.3: Prepare equipment to perform the assembling of components

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Know about pre-assembly activities
2. Know about advantages of pre-assembly activities

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Resources to be Used

- Available objects such as a duster, pen, notebook etc.

### Say

- Before starting the assembling process, workers have to perform certain activities, called pre assembly activities.
- If any one of these activities is overlooked or ignored, the effect on the machine could be an unscheduled or emergency problem.
- Pre assembly activities are necessary to complete the assembly easily and without any troubles.

### Elaborate

Advantages of pre assembly activities are:

- Pre arrangement of all the necessities.
- Shorter assembly time.
- Opportunities for good architecture
- Healthy buildings
- Reduced energy consumption

- Cost effective solutions
- Safety in construction
- Increase in the quality of construction.
- Reduction of construction waste

## Demonstrate

- Explain the benefits of preparation activities.
- Demonstrate the pre-assembly activities.

### Steps – Pre-assembly activities

- Step1:** Firstly you have to inspect the material according to the job requirements has to be done.
- Step2:** For assembling the machine, understand the machine assembly blueprints, drawings and other requirements to recognize the sequence of activities.
- Step3:** Ensure the correct limits, tolerance and fits of equipment components as per the industry norms and standards.
- Step4:** Identify tools and equipment needed for performing the components assembly.
- Step5:** Collect tools required during the assembling process.
- Step6:** Ensure that tools match the desired specifications.
- Step7:** Check tools and equipment required for any damage. Ensure that they are in working condition and doesn't require any repairing.
- Step8:** Report defective and damaged tools and equipment by following the process of escalation matrix.
- Step9:** Ensure the calibration status of all measuring equipment and instruments.
- Step10:** Prepare machine foundation base according to the job work requirements.
- Step11:** Utilize braces, clamps, jacks, ropes and bolt straps to grip components in position.
- Step12:** Ensure and check all tools and equipment required during assembly is ready for operation.
- Step13:** Ensure and check the calibration status of all measuring equipment and instruments.
- Step14:** Utilize portable grinder, scraper or hand file for removing rough spots from work piece.
- Step15:** Check the electrical connections of the equipments.

## Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Perform pre-assembly activities	2 hours	Hand tools Power tools Measuring instruments
		Motor

## Do

- Ask them to get practice the activity in pairs.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

## UNIT 6.4: Ensuring material appropriateness for job

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Know about material need to collect for the job

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- Collect work pieces/ components to be assembled.
- Make sure that material required is collect in right capacity
- Visually inspect the workpiece and ensure that work pieces are of preferred quality i.e. free from rust etc.
- Make sure that work pieces are free from contaminants i.e. grease, paint, rust etc.
- Before assembling process, smoothen out the metal work piece.
- Make sure that, there should be no delays caused as a result of inappropriate preparation and failure to recognize problems.

### Ask

- What are the materials we need to remove from work pieces?
- What do you understand by correct quantity of each material?

## UNIT 6.5: Proper identification of tools and tackles

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Know about proper selection of hand tools
2. Know about proper selection of power tools

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Resources to be Used

- Invigilator can use the available objects such as a marker, duster, pen, notebook, hand and power tools etc.

### Say

- Explain the selection of tools?
- Explain the procedure of selection of power hand tools?

### Elaborate

#### Selection of hand and power tools

- Understand your job work.
- Select the appropriate hand tools required for the job. Ensure that tool handle can fit into the user hands properly; it can't slip out from the hands when using.
- Always use hand tool only for the purpose they are manufacture, never use them for any other work. They are designed according for their purpose i.e. in terms of strength, structure etc. Misuse of tools may lead to any danger or accident.



**Fig 6.5.1:** Tool box

- Hand tools should be inspected every time before use. Give special attention to the cleanliness of tools. Redress the distorted working parts and sharp cutting edges.
- Check tool body and handle for any crack or damage.
- Check that handle of tool is installed properly.
- Check for any faulty trigger lock or switch.
- Inspect tool for any loose or faulty prongs.
- Make sure that you have complete training about the safe operation of tool. Read operator's manual and follow manufacturer's instructions for operating the tool.
- To ensure safety, use manufacturer recommended guard or shield for power tool.
- Check power tools should be grounded properly by three-prong plug and powered by a low-voltage transformer. This arrangement save you from the electric shock.
- Always plug the three-pin plug in a properly grounded 3-pole outlet. Use an adapter to put up the two-hole receptacle, attached the adapter wire to a functioning ground. NEVER take out grounding pin from plug.
- Use continuity tester for testing all tools for effective grounding.
- Use that kind of battery, specified by the tool manufacturer for the battery operated power tool.
- Use charger specified by manufacturer for charging the battery.
- Ensure that power tool is turned off or battery is removed, when you complete the work and storing the tool.
- Ensure that no metal parts, screws, nails etc. can come in contact with the terminals of battery; this can short the battery and can cause fire, sparks or burns.

### Ask

- You could ask the procedure of selection of tools?
- What is known as Inspect cords for defects?
- You could ask the proper procedure of selection of power hand tools?

## UNIT 6.6: Correct handling of tools and tackles

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Know about correct handling of hand tools on floor
2. Know about correct handling of power tools on floor

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Resources to be Used

- Invigilator can use the available objects such as a marker, duster, pen, notebook, hand and power tools etc.

### Say

- To avoid accidents, proper selection of hand and power tools is necessary.
- During the selection some precautions and proper knowledge of hand and power tools is required.

### Elaborate

**Handling of hand tools as follow:**

- Use toolbox or a tool-belt at workplace for carrying the hand tools.
- Prevent unauthorized entry in the workplace, to avoid any accident due to slipping of tool handle and working with long handle tool.
- Check workpieces for any metal pieces stick on them before using tools, these metal pieces may damage the hand tools.

- When working at height, take necessary precautions to avoid slipping of tool from handle.
- Take necessary precautions if working on or near electrical conductors.
- Always operate the tool in correct posture.
- Follow proper procedures when using a hand tool, e.g. for hammering nails use head side of hammer instead of peen side; don't hammer the ends of spanner, use spanners only for screwing nuts and bolts.
- Use suitable PPE, while working with hand tools with sharp corners and edges. Keep the body movement proper when using the tool.
- If flying particles or noise generated during the operation of hand tools, wear proper PPE during the operation.
- Use clamps to secure a workpiece for fix them into a stable position.
- Don't play with the tools, concentrate on job at workplace.

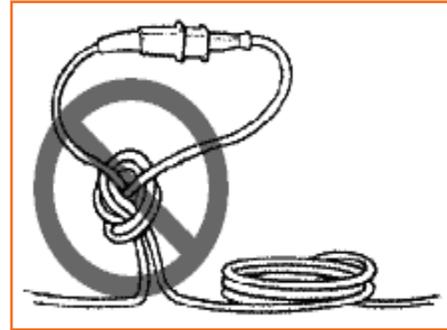
#### **Handling of power tools**

- Wear appropriate PPE when working with power tools
- Turn off the power tool before connecting it to power supply.
- If power cord is too warm or sparking, call the qualified person or main electrician.
- Always disconnect the power supply when making adjustments.
- Before using, check the power cord for any damage. If found defective, tag tool with an "Out of service" tag and replace it instantly.
- When using power tools, keep path clear for their power cords.
- Use bench vice or clamps to hold work piece. This permits you to use both hands for better control of the tool.
- Use only approved extension cords and power requirements of the electric tool which you are using. This saves the power cord from overheating.
- To remove stumbling or tripping hazards, don't hang power cords over aisles or work areas.
- When removing the tool from plug, pull the plug out, not the cord. Pulling the cord may cause wear and tear in cord and can cause the electric shock.
- Follow good housekeeping practices.
- Keep power cords away from sharp edges, water, heat, oil, and moving parts. This can damage the insulation of cord and cause a shock.
- Keep cutting tools like drill bits, etc. clean, sharp and well maintained.

- When tools are not in use, store them in a dry and safe location.

**Precautions taken when using powered tools:**

- Don't use any power tool till that you are not trained for it and you are not aware about its safety precautions.
- Ensure that tool is switched off before plugging in power socket for avoiding accidental starting. Don't walk with the tool in the work area with the switched on tool.
- Don't avoid the use of ON/OFF switch and always operate the tools by using power cord.
- Don't pull out the power cord of tool from outlet for disconnecting the power supply.



*Fig 6.6.1: Wrong handling of wire cord*

- Do not leave a running tool unattended. Do not leave it until it is turned off and stopped running completely.
- Don't make use of electric tools in wet conditions unless tool is grounded.
- Don't use power tools in rain or wet conditions; it gives you an electric shock.
- Stay away with grounded surfaces like refrigerators, pipes etc. when utilizing powered tools; this will reduce the chances of electric shock.
- Don't utilize light duty power cords.
- Don't connect extension cords together for making longer connection; may be resulting extended cord cannot provide suitable power safety.
- Don't tie knots on power cords, this can cause electric shock to the operator.
- Don't use the power tools with unprotected cords where workers, mobile equipments, vehicles are moving.
- Ensure that, there are no explosive gases in the area before using the power tools.
- Don't use flammable or toxic solvents for cleaning tools.

**Ask** 

- What are the steps and procedure should be followed while operating a hand tool.
- What is the personal protection equipment used?
- What all items are includes in PPE?
- What is the full foam GFCI?

## Notes for Facilitation

- Show the steps for handling of hand tools.
- Precautions when using powered tools.
- Using power tools.

## UNIT 6.7: Joining of components

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Know about different assembly joining methods
2. Know about cable joining methods

### Resources to be Used

- Invigilator can use the available objects such as a marker, duster, pen, notebook, torque wrench, nut, thread sealants, cable ties.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- During the machine installation, they have to know about jointing techniques. For different works, jointing technique is different.
- Torque tightening is a application of force on fastener for turning the fastener's nut.
- Threaded sealants can be use to fix the threaded bolts with the machines permanently.
- There are different methods to tie the cables together.

### Notes for Facilitation

- Explain the torque tightening procedure.
- Explain the thread jointing technique
- Explain different techniques of cable jointing.

## 6.7.1: Torque tightening

### Say

- **Torque:** It is a measure of how much force acting on an object which causes that object to rotate.
- **Torque Tightening:** It is the application of force on fastener for turning the fastener's nut.

### Elaborate

#### Torque tightening and preload

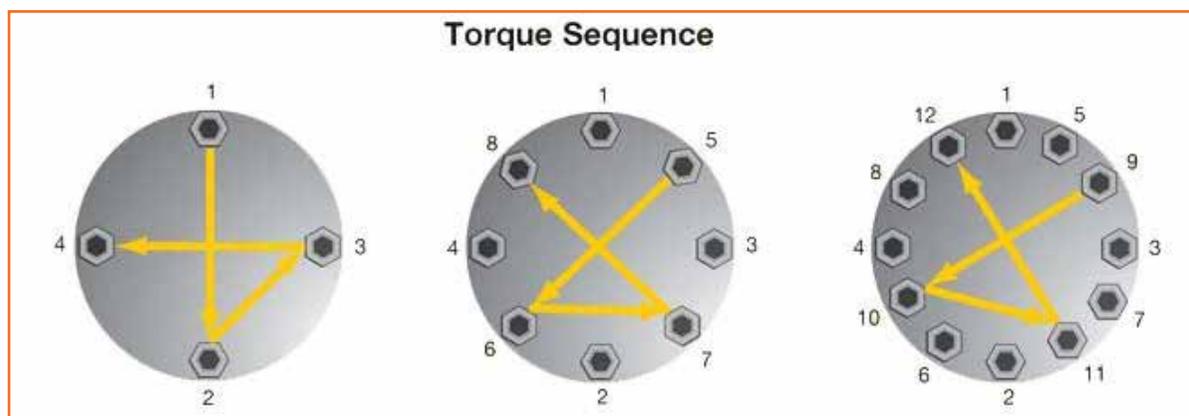
The amount of preload created when torquing is largely dependent on the effects of friction.

Principally there are three different “torque components”:

- torque for stretching the bolt
- torque required to overcome friction in nut threads and bolt
- torque to overcome friction at the nut face

#### Torque procedure

When torquing it is common to tighten only one bolt at a time, this can result in Load Scatter and Point Loading. To avoid this, follow recommended model for apply torque in different stages:



**Fig 6.7.1:** Torque sequence

## Demonstrate

### Steps for torque tightening of machine

**Step 1:** Tightening by spanner make sure that 2-3 threads expand over nut

**Step 2:** Tight each bolt to 1/3rd of the final essential torque following the pattern.

**Step 3:** As shown above, increase the torque to 2/3rd by following the model.

**Step 4:** Follow the above shown mode and increase the torque to its full limit.

**Step 5:** Make a final pass on each bolt in clockwise direction from bolt 1.

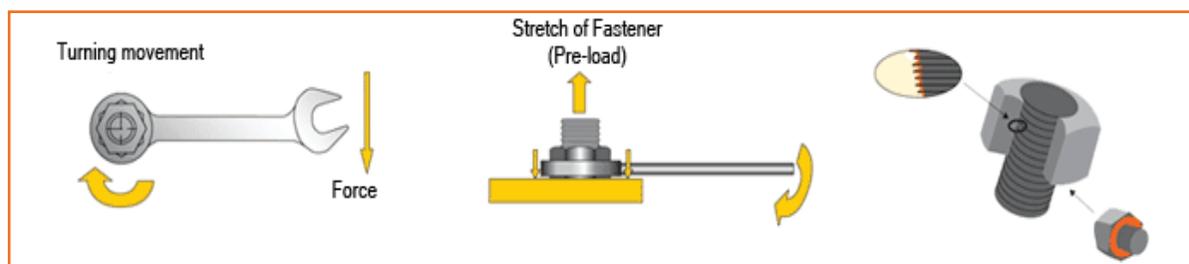


Fig 6.7.2: Torque jointing

## Ask

- What do you understand by Torque?
- What do you understand by Torque Tightening?

## Notes for Facilitation

- Explain the meaning of Torque Tightening and preload?
- Explain the procedure of Torque?

## 6.7.2: Thread Jointing

### Say



- This method pertains to the application and assembly of products by sealing threaded joints.
- When assembling pipes or threaded components, this method can be used by using thread lockers, retainers or thread sealants.

### Demonstrate



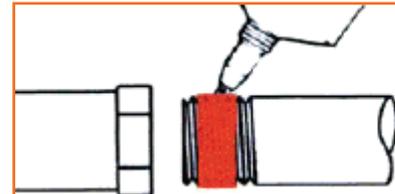
#### Steps of threading and assembling pipes



**Step1:** For thread jointing of components, apply the sealing compound on the male threads. When applying it on pipes, start from the last two at the end of pipe.

**Step2:** Apply the required torque for assembling the joint. Don't over tighten it.

**Step3:** Within one hour, assembled parts will be sealed.



**Fig 6.7.3:** Thread jointing

### Ask



- What is Thread Joining?

### Notes for Facilitation



- Elaborate the procedure of assembling pipes?

### 6.7.3: Electrical cable jointing

#### Say



- Electrical cable jointing can be done by simply twisting the wires and taping of wires.
- Cable jointing method depends on the various factors i.e. voltage, type of connector, type of cable, type of joint and other factors.
- Key factors for ensuring safe and reliable connections are:
  - o Use of appropriate size of connector for a particular cable
  - o Appropriate tools
  - o Stripping and clean cuts
  - o Restoring the insulation, armor and outer-sheath
  - o Proper technique

#### Demonstrate



#### Steps for cable jointing



##### 1. Western union splice joint - STEPS

This method of cable jointing is used for small solid cables

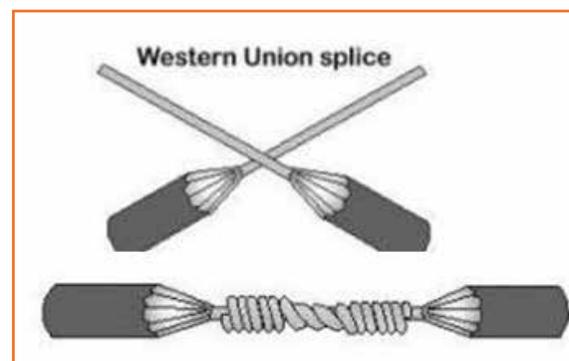
**Step 1:** Remove the insulation

**Step 2:** Bring the two wires into crossed position, and then twist each wire.

**Step 3:** Wrap up the end of one wire around the straight end of other wire. Repeat the wrapping more for four or five times for joining the cables.

**Step 4:** For preventing the cable ends from piecing by the insulation tape; press ends of the wires close to the straight portion of the wire.

**Step 5:** Insulate the joint using the tape.



**Fig 6.7.4:** Western union splice

## 2. Rattail joint - STEPS

The rattail joint is usually used in the junction boxes. It connects a branch or multiple circuits in buildings.

To create the joint,

**Step 1:** Remove the insulation of cable ends has to be joined.

**Step 2:** Twist the wires to create the rattail effect

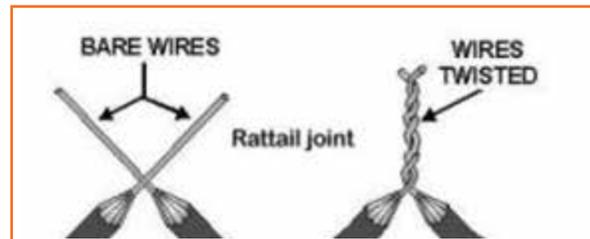


Fig 6.7.5: Rattail joint

## 3. Fixture joint - STEPS

This type is used for making branch joints of small diameter wire to large diameter conductor, like used in lighting fixtures.

**Step 1:** Remove the insulation

**Step 2:** Wrap fixture wire and **branch wire together**

**Step 3:** Bend the branch wire over the completed turns

**Step 4:** Wrap the remaining fixture wire over the bent branch wire

**Step 5:** Do the soldering and taping of the joint for safe and reliable joint.

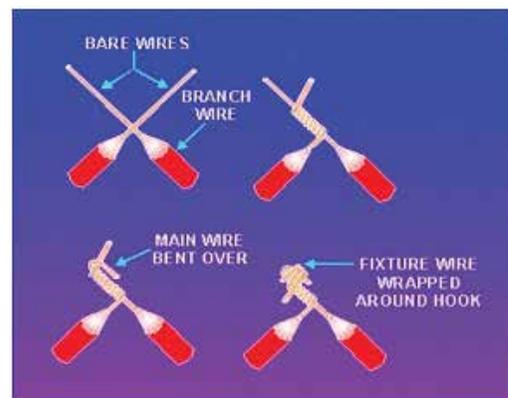


Fig 6.7.6: Fixture joint

## 4. Cable jointing by wire nut and split bolt- STEPS

Rattail joint can be replaced by wire nut jointing. The wire nut is generally housed in a plastic insulating casing. To make a joint,

**Step 1:** Strip the conductors

**Step 2:** Place the conductors into the wire nut

**Step 3:** Twist the nut



Fig 6.7.7: Nut joint

## Ask



- You could ask about different cable jointing methods
- You could ask requirements for torque tightening

## Activity



- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Torque tightening and cable jointing practice	2 hours	Torque wrench Nut Cable ties Cables
		PPE

## Do



- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

## UNIT 6.8: Machines installation and Maintenance

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Know about motor installation
2. Know about motor maintenance

### Resources to be Used

- Invigilator can use the available objects such as a marker, duster, pen, notebook, electric equipments and motor etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- All personnel involved with electrical equipment, installation, operation or maintenance should be well trained and have complete knowledge of safety practices and principles for completing the work.
- Storage: Always lift the motors by eyebolts, never by the shaft.
- Store the motor proper position in a dry even temperature place, which is free from dust, corrosive smoke, gases if motor has not to be install.

### Elaborate

Do's before installation the motor please check:

1. For any visible damage or crack on electric motor
2. Nameplate for the information related with the motor features and its operation, voltage and power requirements.

3. Keep the ambient temperature between  $-15^{\circ}\text{C}$  and  $+40^{\circ}\text{C}$ .
4. The relative humidity level is 90%.
5. Check that the IP protection rating is given on the nameplate.

## Demonstrate

### Steps for motor installation

#### Mechanical installation

**Step 1:** Foundation: Ensure that base for motor is level and free from any vibrations. Generally for 100 HP (75kW) motor, foundation made of concrete is preferred.

**Step 2:** Types of Bases: Slide Rails, Foundation Studs and Metallic Base

**Step 3:** Alignment- In case of direct coupling, align the electric motor accurately with the driven machine. Wrong alignment can cause failure of bearing, vibrations and even shaft rupture.

- Take one reading axially and the other radially by dial gauges placed on each coupling half.

**Step 4:** Coupling- Because of low cost and space, no belt slippage and lower accident risk; **direct coupling** is recommended always.

- **Belt coupling** is usually used when a speed ratio is required.

**Step 5:** Assembly of Pulleys: For assembling of pulleys on shaft ends by keyway and threaded end holes, insert the keyway halfway in the shaft by manual pressure.

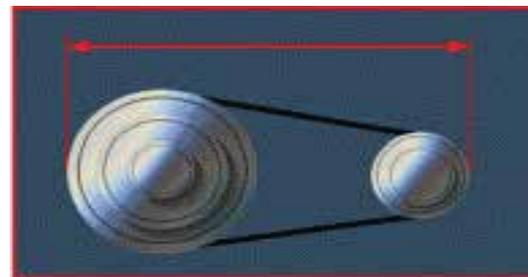


Fig 6.8.1: Pulley Coupling

#### Electrical installation

##### 1. Wiring:

- As shown in motor circuit diagram, do the motor terminal box wiring to the mains.
- Don't do the motor wiring, if wiring diagram is not available.

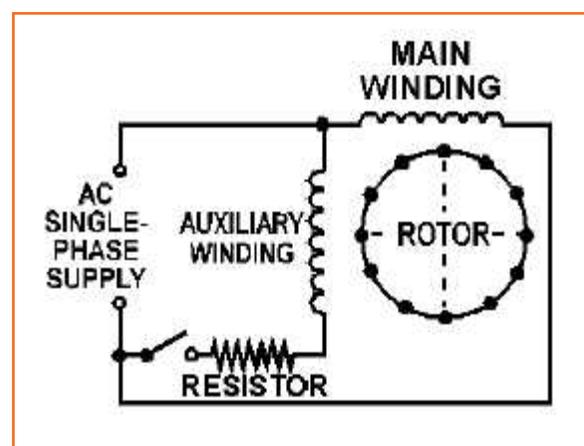


Fig 6.8.2: Electrical wiring circuit

- Don't start the motor with unengaged key.
- Before making electrical connections, ensure that motor wires are properly tightened with the terminal block.

Motor should start quickly and run smoothly, when connected with load and started in appropriate direction of rotation. If motor is not running properly, immediately stop the motor and identify the issue. Probable issues are:

- low voltage
- incorrect motor connections
- too heavy load

Check and measure motor current after few minutes of operation and compare it with the nameplate rating.

## 2. Grounding

- The power and GND cables must comply with recognized standards. Cables should be insulated correctly.
  - All motors terminal block box and outside motor casing has to be grounded appropriately; mark the GND clamp points with the appropriate symbol.
  - Protect the GND cable to avoid slackening.
3. Check direction of rotation of motor before starting it. If it is required change the direction, for three-phase motors simply swap 2 phases.
  4. After wiring, reinstall the terminal block cover with its gasket.
  5. Before starting motor, check and inspect the operation of brake and braking torque.
  6. When motor is running, don't touch the motor's housing as housing temperature can reach more than 50°C.

**Adjustment:** There are no adjustable parts in AC motors, but some DC motors has adjustable neutral terminal.

## Ask



- What do you understand by Foundation?
- What is the recommendation of concrete foundation for motor?
- What are the different types of Bases?
- Why we need to use dial gauge?
- When we need to use Belt coupling?

## Say



- A well planned maintenance program for electric motors if used correctly can be summed up as: periodical inspection of temperature rise, bearing lubrication insulation levels, wear and irregular checking of fan air flow.
- Keep the motors clean from debris, dust and oil. Use soft brushes or clean cotton rags for cleaning. Use a jet of compressed air to clean any collected dirt on the fan and cooling fins.
- Proper lubrication improves life of bearing. Lubrication maintenance includes:
  - a) Attention to overall condition of bearings;
  - b) Cleaning;
  - c) Careful inspection of the bearings.

## Elaborate



- Lubrication of bearings is must to avoid the contact between the moving parts, and also for protection against corrosion and wear.
- Properties of lubricant depreciate with time and mechanical operation. All lubricants will contaminate under working conditions.
- To apply correct amount of grease is an important aspect for a good lubrication.
- However, when a motor is fitted with a lubrication instructions plate, these instructions must be followed.
- For an efficient bearing lubrication, follow the motor manual. If manual is not available, the bearing must be greased up to its half.
- Proper care and cleanliness is essential when performing these activities to avoid penetration of dust into the bearings.
- Grease applied must be correct and in sufficient quantity as both insufficient and excessive greasing are harmful.
- Excessive greasing causes overheating generated by the greater resistance caused on the rotating parts.
- This can cause leakage in the grease, which penetrates the motor and start dripping on motor coils and other components.



*Fig 6.8.3: Lubrication*

- For lubrication of electric motor bearings; lithium based grease is usually recommended because it has good mechanical stability and it is unsolvable in water.

## Demonstrate

### Steps for lubrication

- Step 1:** Clean the area, where greasing has to done by clean cotton cloth.
- Step 2:** If motor is running, use manual grease gun for adding grease until the quantity of grease preferred has been applied.
- Step 3:** Permit the motor to run, which is adequate to throw out excess of grease. Apply Vaseline or oil to protect all machined parts against oxidation.

## Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Motor installation	3 hours	Motor Tools and equipments
		PPE

## Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.





## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Know about testing of material
2. Know about housekeeping activities after the assembly
3. Know about waste management

## UNIT 7.1: Testing of material

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Know about quality check and testing process

### Do

- The goal of quality control in every production system is to
  - o eliminate nonconformities and their consequences,
  - o eliminate rework and wasted resources,
  - o achieve these goals at the lowest possible cost and
  - o Get less rejections

### Demonstrate

#### Steps for checking end product

**Step 1:** Measure the specifications of the finished part and confirm conformance according to CP/WI.

**Step 2:** Use measuring devices like gauges, micrometers, vernier callipers and any other measuring equipment for measuring specifications.

**Step 3:** Perform basic testing and inspection tests for quality check.

**Step 4:** Note down the observations found during inspection and identify workpieces which are meeting the required standards.

**Step 5:** Separate the defective pieces into two categories –

- workpieces which can be repaired or modified again
- workpieces which cannot repair.

### Ask

- Ask about importance of quality check.
- Ask about process of checking end product.

## UNIT 7.2: Ensuring housekeeping and safety on the shop floor

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Performing housekeeping activities on the floor
2. Maintaining safety on the floor

### Say

- Good housekeeping practices benefits are:
  - o Prevent slips, trips and falls
  - o Eliminate fire hazards
  - o Control dust
  - o Prevent spills
  - o Prevent falling objects
  - o Clear clutter

### Elaborate

To ensure the safety, you need to follow the following housekeeping practices:

1. **Prevent slips, trips and fall:** Slips and falls are the major reason of many nonfatal occupational injuries or illnesses. To avoid slip and fall incidents, follow the following practices:
  - Clean up spills and leakages.
  - Don't store items near and on aisles and exits.
  - Place warning signs near hazardous area.
  - Replace ripped and damaged flooring.
  - Consider installing anti-slip flooring in areas where cleaning is not possible regularly.
  - Use guards and drip pans.
2. **Eliminate fire hazards:** You are answerable for keeping needless combustible materials in the work area. Store the combustible waste in covered bins.
  - Only keep required amount of combustible materials in the work area.
  - Store flammable materials away from ignition sources.



Fig 7.2.1: Fire exit

- Avoid contamination of clothes with flammable liquids. Change clothes if contamination occurs.
- Keep passage ways and fire doors free of obstructions. Always keep the stairs door closed.
- Keep materials at least 18 inches away from fire extinguishers and automatic sprinklers.
- Always report the hazards in electrical areas.

**3. Control dust:** Vacuuming is the ideal way of cleaning dust. Wash-down by water and sweeping are some other ways of cleaning. Compressed air or steam is also used for cleaning of unreachable or insecure surfaces. Following are some recommendations for cleaning:

- Minimize flow of dust from ventilation systems.
- Use filters for dust collection;
- Minimize dust accumulation
- Provide admittance to all concealed areas for inspection
- Check for dirt remains regularly in open and concealed areas
- Clean dirt remains regularly;
- Use those cleaning ways which don't create dirt fumes, if ignition sources are present;
- Use vacuum cleaners for collection of dust;

**4. Spills and Liquids:** Leakage in machinery due to the lubricants, overspray, metal filing and water all are commonly found housekeeping problems. For many of these issues; use mats and drip pans to collect leaks for keeping work areas clean, dry and safe, otherwise this makes floor wet and slippery.

Keep adequate stock of wipers and absorbents in areas where spill problem occurs regularly.

**5. Prevent falling objects:** When storing objects, place heavy objects on lower shelves. Don't place equipment near the edges of shelves.

**6. Clear clutter:** Cardboard, shrink wrap, leftover production materials, broken wooden pallets etc. are general forms of clutter in workshop. These materials can cause safety issues if moving vehicles and workers are walking around them. Dispose of these materials rather than stacked them if not required for any purpose. Empty the trash cans and bins regularly to avoid overflow.

Key factors for good housekeeping are allowing time for routine cleaning after every shift, and cleanup the materials and tools at suitable locations to facilitate their use.



*Fig 7.2.2: Safe storage of liquids*



*Fig 7.2.3: Electrical wiring circuit*

**7. Use and inspect personal protective equipment and tools:** Wear recommended PPE like safety shoes and glasses while doing housekeeping activities. Identify the type of PPE required based on the risks associated.

Regularly inspect, clean and fix tools. If found any damaged tools, remove it from the work area.



**Fig 7.2.4:** PPE

### Do

- Demonstrate housekeeping practices at workplace.
- Show the tools and material requirements for housekeeping

### Ask

- You could ask elements of housekeeping
- You could ask benefits of housekeeping
- You could ask methods of housekeeping

## UNIT 7.3: Waste Management

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Discuss about waste management
2. Know about elements of waste management
3. Know about methods of waste management

### Say

- Waste management is gathering, transport, recycling, processing and disposal of waste materials. Waste management is carried by recovering resources from waste materials.
- Waste may be classified as garbage, rubbish, industrial wastes, mining wastes etc.
- Industrial waste can be of two types: non-hazardous and hazardous waste.
- Waste management strategy involves legal and proper decomposition of waste.
- Methods of waste management are segregation, composting and burning.

### Elaborate

#### **Elements of a waste management strategy**

Good waste management practices involve much more than that disposing of waste legally and properly. Strategy for the management of industrial waste can include the subsequent elements:

- Current waste management procedures and primary audit of wastes produced.
- Risk assessment to find that stowage and handling procedures does not possess any health or environmental risk.
- Identification of options for reuse, waste reduction, recovery assessment and recycling of waste.
- Identification of best practicable environment! There should be an option for dumping of waste and residues.
- Selection of the contractor offering the best service and audit of potential waste management contractors.

### Waste management methods

1. **Segregation:** Separation of waste using different containers is necessary because plastics, building materials, glass and waste from the site work could take a really long time period to decompose. This is the reason, thus, it is required to maintain green practices so waste management should be done



*Fig 7.3.1: Waste segregation*

with proper segregation. Thus we make sure to support you in removing hazardous waste from compostable non-hazardous solid waste, organic waste, recyclable materials and other regulated material.

2. **Composting:** This waste management process turns waste into organic compounds that you can use to feed plants. In terms of the environment advantages this is actually beneficial technique. Making use of this method, it's easy to turn unsafe organic products into safe compost.
3. **Burning:** If your approach is not towards disposing materials and other wastes, then burning method will be a good approach for you. If waste is bio-degradable or cannot produce hazardous gases after burning, you can burn the waste.



*Fig 7.3.2: Waste Compositing*

### Ask



- You could ask the elements of waste management strategy
- You could ask from the students' different method of waste management

### Field Visit



- You could visit any of the industry and show the waste management system and how they do the segregation of waste.



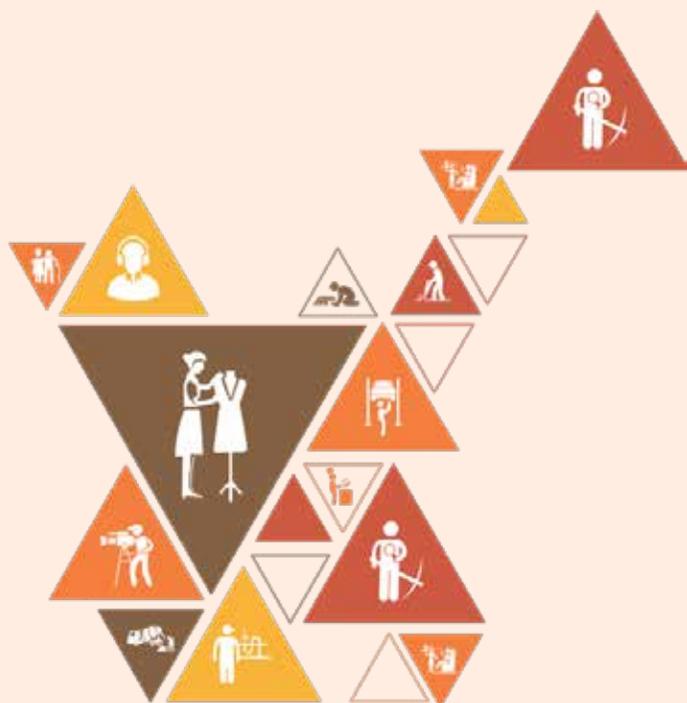
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## 8. Carry out quality checks

Unit 8.1 – Quality checks and inspection tests

Unit 8.2 - Corrective actions taken and review of their effectiveness



ISC/N1006

## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Know about importance of quality checks
2. Know about different inspection tests
3. Know about corrective measures taken after quality checks

## UNIT 8.1: Quality checks and Inspection tests

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about importance of quality checks
2. Know about different types of inspection tests

### Do

- Quality can be described as fulfillment of customer requisites and specifications defect free.
- The goal of quality control in every production system is to
  - o Get rid of noncompliance and their outcome
  - o Eradicate rework and washed out resources,
  - o Attain these objectives at the minimum feasible cost and
  - o Get less rejections

### Say

- Testing techniques are classified into 3 categories: Visual inspection, Destructive testing and non-destructive testing.
- A visual examination scrutinize bead form, width and thickness; also any defect such as undercut, overlap, cracks, pits, and slag inclusions in the surfaces of product.
- Destructive tests aim to examine the mechanical, chemical, and metallurgical properties by breaking, deforming, or chemically processing test specimens.
- Nondestructive tests can detect defects in welds by utilizing radiation and ultrasonic waves

### Elaborate

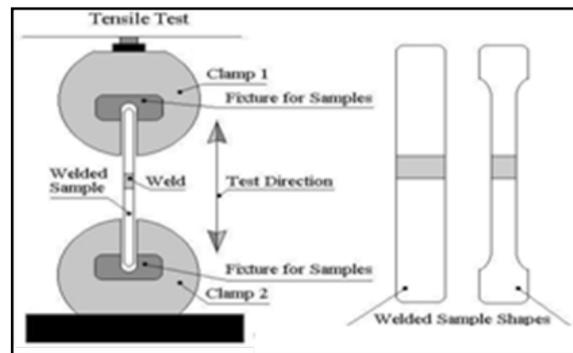
**Visual inspection** is simple and inexpensive therefore, it is commonly applied to all tools, equipments and machines.



**Fig 8.1.1:** Visual inspection

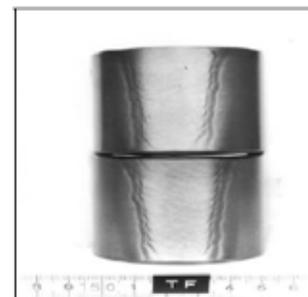
**Destructive tests** further classified into following tests:

- A) **Tensile Test:** This test is used for determining the tensile Strength, Yield point and reduction in area.



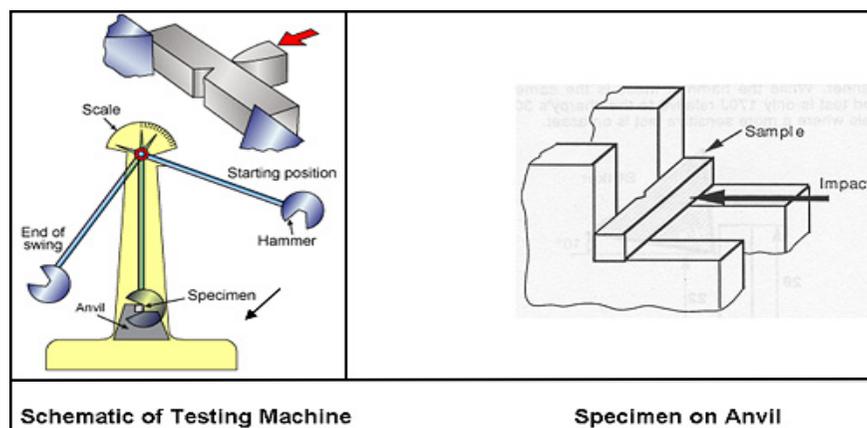
**Fig.8.1.2:** (a) (b) Tensile strength test

- B) **Bend Test:** Bend tests examine the ductility of metals and whether they contain defects or not.



**Fig.8.1.3:** Bend test

- C) **Impact Test:** Impact Test is conducted to determine the resistance to impact loads or shock loads.



**Fig.8.1.4:** (a) (b) Impact test

- D) **Hardness test:** The hardness test is performed to ensure if the metal is hard enough or not to stand firm mechanical wearing, depending on the handling.

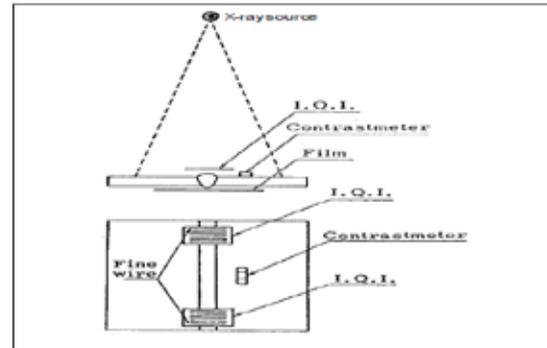


**Fig.8.1.5:** Hardness test

**Non-destructive tests** Destructive tests are conducted for test specimens, not for a product. Since finished products should never be fractured by a test, it is important to examine the soundness of welds without breaking them. For this purpose, nondestructive tests are conducted.

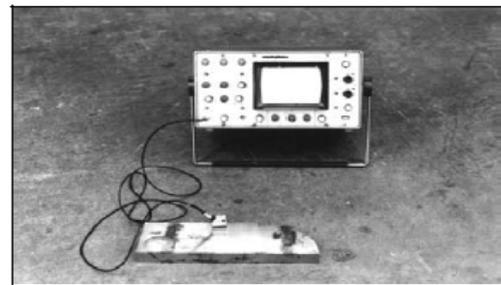
Some of the nondestructive tests are:

- A) **Radiographic test:** When an accelerated electron hits a target of heavy metal, the radiation emanates. This radiation is a kind of electromagnetic wave; and the shorter the wavelength, the stronger its penetrative capacity. X-rays and  $\gamma$ -rays are called the radiographic test.



**Fig.8.1.6:** Radiographic test

- B) **Ultrasonic test (UT):** The ultrasonic test is a detection method which causes an inaudible, short sonic wave of 0.5-15 MHZ (megahertz) to penetrate the object to be tested.



**Fig.8.1.7:** Ultrasonic test

#### Raw material inspection

- Check manufacturer's written certification that all material meets appropriate.
- Visually inspect all rolls of goods for defects, contaminants and edge regularity.
- All defects or impurities will be cleared from the roll before doing the fabrication into panels or rejection of the roll.
- Measure the thickness of each roll of material at the beginning and end.

#### Raw material testing:

- Visually check or inspect the surface uniformity of the material. Check for dust or any contaminants.
- By using micrometer, measure and inspect the thickness of material as per the job drawing requirements.
- Use tensile testing machine to check the tensile strength of the material.

#### Machine and equipments testing

- Visually check the machine and equipments for any damages.
- Use destructive tests to check the physical properties of equipments.
- Use non-destructive tests to identify the faults and defects in the machine and equipments.
- After testing tag the equipment with its part number or transaction number.
- Fill the inspection log sheet for keeping the information in future use.

**Tools and measuring instruments testing**

- Visually check the tools and instruments for any damages.
- Use destructive tests to check the physical properties of tools and instruments.
- Manually operate and check the tools are working properly or not.
- Check the accuracy of measuring instruments by comparing the zero reading of instruments with the standard industrial measurement reading.
- Fill the inspection log sheet for keeping the information in future use.

**Electrical connections testing**

- Test the electrical connections of the various power operated equipments.
- Do the earthing or ground resistance testing of the equipments by using earth testers and megger.
- Check the electrical connections e.g. phase wire, neutral wire and ground wire visually or by using neon tester and test lamp.
- If found any defect in connection wire replace it, otherwise it may give you a severe shock or damage the equipment.
- After completing the operation always switch-off the equipment power, otherwise it can become risk for serious accidents or hazards.
- Fill the inspection log sheet for keeping the information in future use.

**Do** 

- Demonstrate destructive tests in lab
- Show the procedure of non-destructive tests.

**Ask** 

- You could ask when nondestructive tests are conducted
- You could ask what are the tests under destructive test
- You could ask name the two methods which is called as radiographic test
- You could ask the process of ultrasonic test

**Activity** 

- Conduct a skill practice activity.
- Ask the students to assemble together.

- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Perform destructive tests and non-destructive tests	4 hours	Destructive tests machines Non - destructive tests machines
		Rotary machine

**Do** 

- Ask them to get practice the activity in pairs.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

## UNIT 8.2: Corrective actions taken and review of their effectiveness

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Get the understanding of how to take the corrective actions
2. Get the understanding of how to review and report the corrective actions effectiveness to the management

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts

### Say

- After performing certain inspection and testing methods, if any defect or fault identify in the machine, equipments and tools, corrective actions has to be taken for resolving the issues.
- Correction action is implemented to address:
  - o the root cause(s) of the incident,
  - o Prevents recurrence of similar, future events.

### Elaborate

**Corrective actions taken are:**

- If material is found inappropriate, change and get the appropriate material required according to the job design requirements.
- If raw material is found dirty or contaminated, clean it with the prescribed cleaners.
- If tools are found faulty or damaged, check:
  - o Tool has to be discontinued or repaired.
  - o If found fault can be repaired, then repair the faulty part
  - o Always lubricate the tools after using and keep them in designated place.
  - o Fill the inspection log report and give all the information about repairing of tool.
- If measuring instruments are found inaccurate, calibrate them and again check the accuracy for correct measurement. Always lubricate the measuring instruments for keeping them accurate and operational.

- If machine and equipments found damage or faulty:
  - o Check whether defects or faults can be repaired or not.
  - o If repairable then inform the supervisor and do the repairing process.
  - o If not, then inform the management for discontinuing the machine.
  - o Fill the log report and give all the information about repairing of equipment.

### Ask



- You could ask need of corrective actions.
- You could ask where and when corrective actions can apply.





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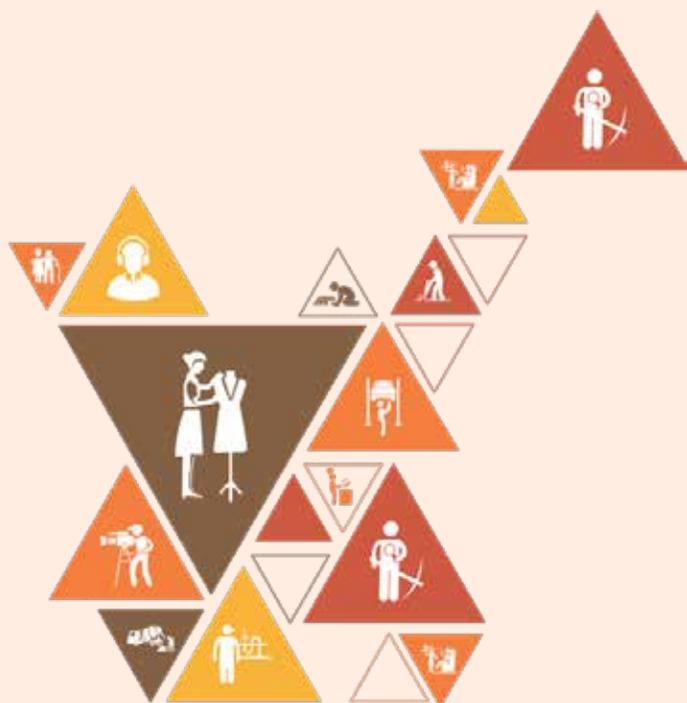
Transforming the skill landscape



# 9. Reporting and Documentation

Unit 9.1 – Documentation for health and safety

Unit 9.2 - Documentation of defects



ISC/N1005

## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Know about reporting and documentation requirements
2. Know about accident reporting
3. Know about reporting of defective tools

## UNIT 9.1: Documentation for health and safety

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about accident and incident reporting
2. Know about how to write reports properly
3. Know about how to escalate the issues properly

### Resources to be used

- Available objects such as a duster, pen, notebook etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- It is of utmost importance to inform about the accidents and incidence straightaway, irrespective of the impact of it.
- Hazard reports can take a number of different forms:
  - o the standard hazard report used by workers for all hazards
  - o reports of infections
  - o near-miss incident reports
  - o reports of damage and faulty tools, equipments and machines
  - o routine inspection reports
  - o Behavior incident reports.
- Reporting of incidents and accidents is required under the Work Health and Safety (WHS) legislation
- Always report an accident to management immediately. There should be a form at each workplace that you (or the person involved) and any witnesses can fill out, where possible, otherwise it can be completed by a health and safety representative (HSR) if necessary.

## Elaborate



The form should cover the following areas:

- Description of the occurrence – what was the event that occurred, which required this report to be completed?
- Nature of injury or disease – select the most appropriate description from a range of options.
- What injury or disease happened as a result of the occurrence?
- First aid, medical treatment or hospital admission – this section asks for a description of what was done to treat the injury or disease.
- Part of the body affected – tick off which part or parts of the body were affected as a result of the occurrence.
- Source of injury – what actually caused the person to be injured or acquire a disease? This could be a piece of machinery or other hazardous materials for example.
- Probable cause or causes of injury – how was the source listed above actually responsible for the injury?
- Investigation – this asks a series of questions that seek to find out why the person has been injured or has acquired a disease.
- Notification checklist – this checklist makes sure that everyone who should have been contacted regarding the matter has been contacted and asks whether appropriate action has been taken by the authorities.
- Preventative action – this asks whether or not any action has been taken to prevent the occurrence from happening again.
- Witness details – this part is to be filled out if someone saw the occurrence happen. It is essential if any sort of legal action is to be taken.

## Ask



- You could ask the areas covered in form
- You could ask the suggestions for completing appropriate report

### Notes for Facilitation

- You could ask the students why reporting and documentation is necessary.
- You could ask from the students about the important things to remember filling reports and documents.
- Assume you got an accident at work place on your knees. File a report and inform the management about the accident.

### Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- Make the fire accident report

Skill Practice	Time	Resources
Fire accident report	1 hour	Checklist

### Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

## UNIT 9.2: Documentation of defects

### Unit Objectives

**At the end of this unit, students will be able to:**

1. Know about reporting of faulty and damage tools

### Say

- Like accident or incident reporting, reporting of faulty and damaged machine, tools and equipments is also necessary.
- Any damaged, faulty or malfunctioning tools, equipment should be immediately withdrawn from use and addressed according to organizational policies and procedures
- You should have to check the following details before doing reporting or providing any repair suggestions:
  - o Last date of inspection
  - o Last date of repair and which part was repaired.
  - o Life cycle of the tool, equipment or machine

### Elaborate

In machine or equipment faulty or damage report you have to provide following details:

- Name of the tool or machine
- Registration details of machine
- Who does the inspection of toll and machine before the use
- Trouble or hazard from the defective tool or machine
- Defective part name or number
- Remedial action - Tool or machine has to be discontinue or need repair
- Which process is going to affect due to the faulty machine or tool
- Report whether the machine or tool is performing accurately or precisely.
- Report that there limits, fits and tolerances are set or not according to industrial standards.

## Ask

- You could ask the details before doing reporting or providing any repair suggestions
- You could ask the details which are to be required In machine or equipment faulty or damage report

## Notes for Facilitation

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.





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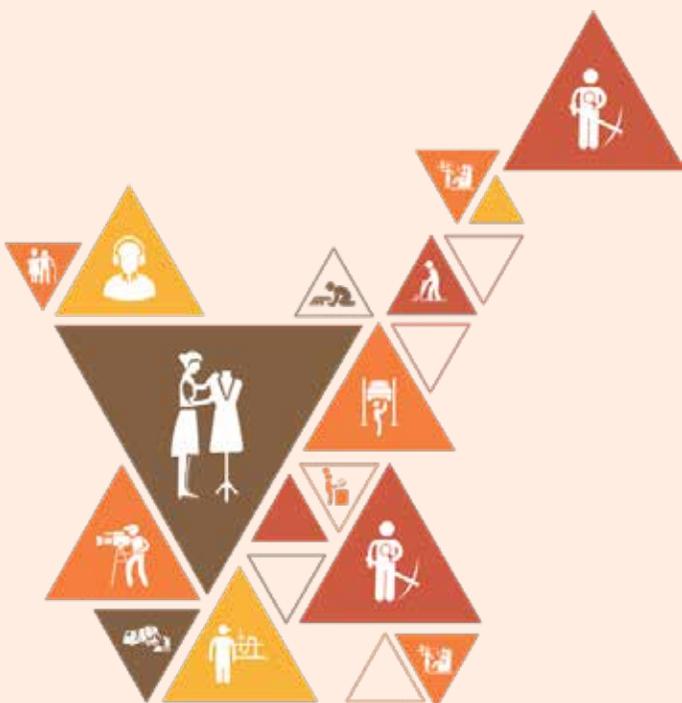
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# 10. Problem identification and escalation

Unit 10.1 – Risk management

Unit 10.2 – Escalation matrix



ISC/N1007

## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Know about identification of problem
2. Know about risk management process
3. Know about escalation matrix and problem escalation process

## UNIT 10.1: Risk Management

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about risk management process
2. Know about inspecting controlling and controlling the problems

### Resources to be used

- Available objects such as a duster, pen, notebook etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- Risk Management consists of methodical steps for handling hazards in the workplace.
- One major component of risk management is workplace safety inspections. Inspections are a major tool in ensuring that a workplace remains safe.

### Elaborate

One major component of risk management is Workplace Safety Inspections. Inspections are at major tool in ensuring that a workplace remains safe. They help to identify and address new problems or unsafe conditions. Do the inspection according to the inspection checklist made by the organization according to their norms and standards.

After inspection, make an inspection report, which includes the following information:

1. Fill in the name of the area inspected if not already indicated on the sheet, the date and inspectors' names in the area provided. Make sure all pages are attached and kept together with the front page.

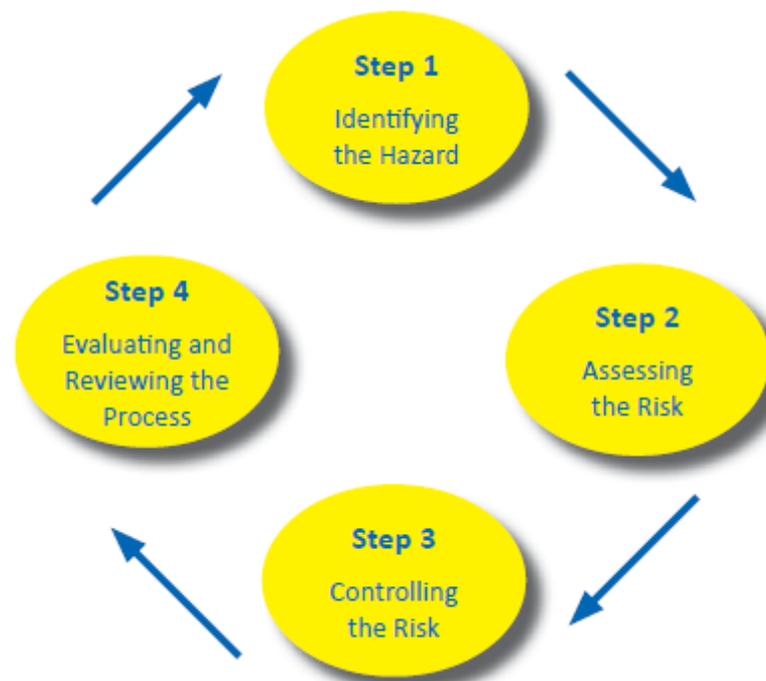
2. Check either yes or no according to the situation or item listed, or put a check next to each listed control. If you can't check off the presence of a control, or answer no to any of the questions, this indicates action is needed. To better prioritize action, evaluate the hazard's severity.
3. Record suggested remedial action in the comments for the identified action items. State what needs to be or should be done to correct and better control the hazardous situation.

## Demonstrate

- Explain the benefits of workplace inspection.
- Demonstrate the process of risk assessment

### Steps – Risk assessment

Risk management is the process of:



*Fig 10.1.1: Risk management process*

- Step 1: Identifying** any anticipated problem – Anything that could lead to any harm to any person in the work place, e.g. machine moving, poisonous chemicals, and jobs requiring physical interference.
- Step 2: Evaluating** the issues – Assessing the problem on the basis of their impact, e.g. can it cause a severe injury, sickness or fatality and how likely is this to take place?
- Step 3: Control** the problem or if it's not feasible, controlling the threat arising out of the problem – putting in to practice such strategies that can eradicate or manage the problem, e.g. designing

the equipments differently, putting in machine guards at place, using harmless chemicals, placing heavy objects lifting equipments to reduce manual weight lifting or PPE or inform to supervisor or seniors.

**Step 4: Analyzing** risk evaluation - to keep a check on control measures and adding better control measures. Also need to discover secure ways of doing things.

- Ask** 
- You could ask how to control the problems
  - You could ask from the students risk management process

- Notes for Facilitation** 
- You could ask the students what are the important information make an inspection report

- Activity** 
- Conduct a skill practice activity.
  - Ask the students to assemble together.
  - Explain the purpose and duration of the activity.
  - Set guidelines pertaining to discipline and expected tasks.
  - Make the checklist of inspection according to norms and standards and Conduct the inspection of workplace
- | Skill Practice | Time   | Resources |
|----------------|--------|-----------|
| Inspection     | 1 hour | Checklist |

- Do** 
- Ask them to get into pairs for practice.
  - Go around and make sure they are doing it properly.
  - Wrap the unit up after summarizing the key points and answering questions.

## UNIT 10.2: Escalation Matrix

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Discuss about problem management process
2. Know about escalation matrix

### Resources to be Used

- Available objects such as black or white Board, chalk pieces or white board marker pens, duster.
- PC with LCD Projector or Flip Chart
- Participant Manual

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- For escalating issues to the concerned department, every organization follows a specific procedure. This procedure is based on escalation matrix.
- Escalation matrix is a complaint logging system (complaint box) allows you to specify multiple user contacts to be notified in the event of issues.
- By using escalation matrix you can notify the right people at the right time about critical alerts irrespective of the business hours. The escalation matrix is time zone specific and it is available 24X7.

### Elaborate

- **Key features of escalation matrix are as follows:**
  - The escalation levels are based on schedules.
  - The service is available 24X7 and schedules are allocated accordingly.

- The schedules are –me zone specific.
- A matrix can be defined at multiple levels ranging from senior management to lower management.

#### Problem management process

1. Identify problems as described earlier
2. Logging problems – Log the complaint report to the concerned person via email or procedure specified by organization.
3. Categorize problems – categorize the problems into hazards, accidents, faulty tools or equipments and general problems.
4. Prioritization of problem – prioritize the problem according to its impact or severity into high, low, moderate and critical.
5. Initially diagnosis the problem and collect data and information regarding that.
6. Escalate the problem to the management through the escalation procedure.
7. Review the remedial action taken by the management to resolve the situation
8. If found any problem again, then notify the management again about the problem and also suggest the remedial action required for it.
9. Close the complaint after solution of problem.

## Demonstrate

- Explain the benefits of workplace inspection.
- Demonstrate the process of risk assessment

### Steps - Escalation Matrix

**Step 1:** Complaint of a given category will by default be assigned and notified by email to the Level 1 department of that category.

**Step 2:** It defines which an issue has to be raised to whom and within which time frame.

**Step 3:** If the complaint is not resolved within X number of days (X is the time defined for Level 1 department to resolve the issue), the complaint will be escalated to Level 2 department.

**Step 4:** If the complaint is not resolved within Y number of days (Y is the time defined for Level 2 department to resolve the issue), the complaint will be escalated to Level 3 department.

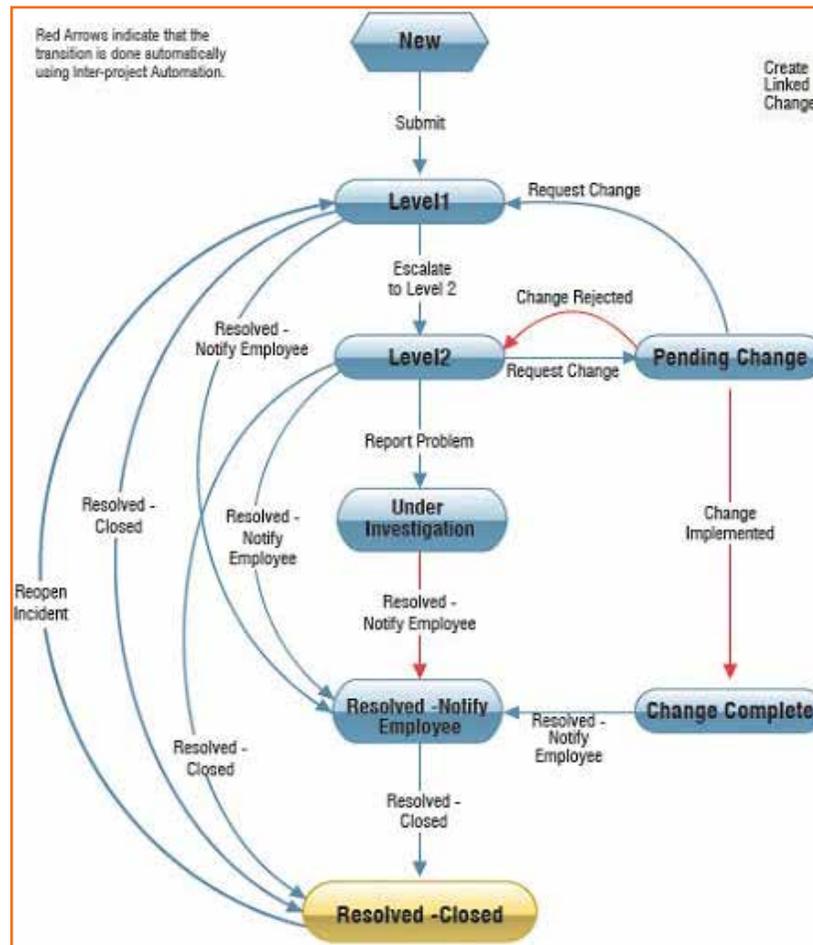


Fig 10.2.1: Escalation matrix

### Ask



- You could ask what is escalation matrix and its features
- You could ask the process of problem management
- You could ask how does escalation matrix work for complaints

### Notes for Facilitation



- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.



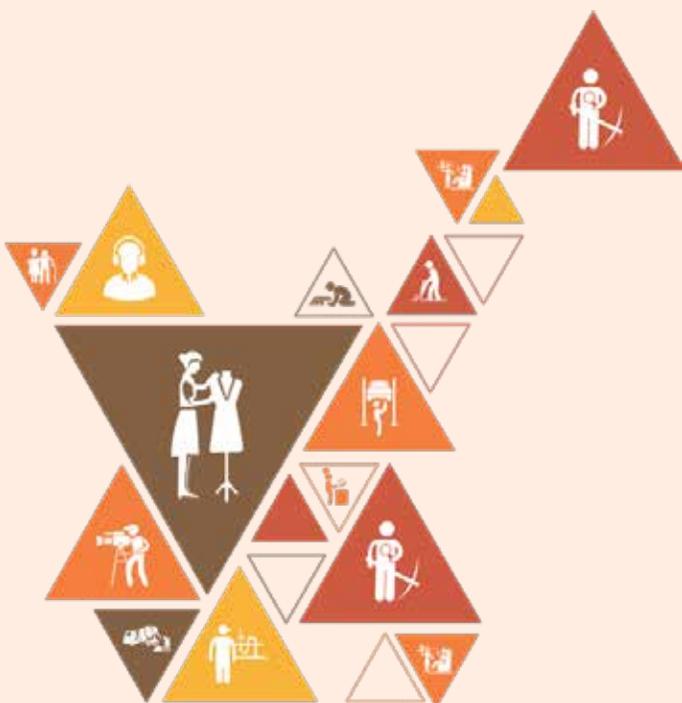
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# 11. Work effectively with others

Unit 11.1 – Ensure appropriate communication with others

Unit 11.2 – Workplace etiquettes



ISC/N0009

## Key Learning Outcomes

**At the end of this module, students will be able to:**

1. Know about effective communication with colleagues
2. Know about workplace etiquettes

## UNIT 11.1: Ensure appropriate communication with others

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Know about how to communicate effectively with colleagues
2. Know about effective communication

### Resources to be used

- Available objects such as a duster, pen, notebook etc.

### Do

- Welcome and greet the participants. Revise the learnings of the previous sessions and ask them if they have any doubts.

### Say

- The success of the organization depends on each colleague.
- For success of organization learn your co-workers' names and learn them quickly because people loves hear their names.
- It doesn't matter a person is more or less significant because of his/her designation. You should respect every employee.

### Notes for Facilitation

- You could ask the students what are the ways of effective communication with colleagues

## Team Activity

- Conduct a skill practice activity.
- Ask the students to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Skill Practice	Time	Resources
Effective communication between 2 persons	1 hour	Communication tools

## Do

- Ask them to get into pairs for practice.
- Go around and make sure they are doing it properly.
- Wrap the unit up after summarizing the key points and answering questions.

## UNIT 11.2: Workplace Etiquettes

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Know about organization policies and procedures
2. Know about workplace etiquettes

### Say

- Workplace etiquettes are also important aspect of organization policies and procedures.
- Work station should be professional and well-ordered with suitable private touches! It reflects good impression on the team mates.
- Make a Positive impression, cooperate with colleagues and work space savvy are some important tips to help you succeed on the job.
- Work station should be professional and well-ordered with suitable private touches! It reflects good impression on the team mates.

### Elaborate

Organization policies and procedures while working with colleagues:

- Never use abusive words with the colleagues
- Follow work etiquettes
- Never share secret or confidential information with your colleagues
- Help your colleague in case of emergency or difficult situations
- Coach your colleagues in case of problems and about organization policies and procedures.
- Communicate with them properly.

### Notes for Facilitation

- You could ask the role of colleagues in the success of the organization
- You could ask the students how to make a good impression on the job





## Introduction: Employability and Entrepreneurship Skills

This Facilitator's guide includes various activities which will help you as a facilitator to make the sessions participative and interactive.

### Ice breaker

- You can begin the module with the following ice breaker:

#### Five of Anything Ice Breaker Steps:

- Divide the participants into groups of four or five by having them number off. (You do this because people generally begin a meeting by sitting with the people they already know best.)
- Tell the newly formed groups that their assignment is to share their five favourite movies of all time, their five favourite novels or their five least liked films. The topic can be five of anything - most liked or disliked.
- This ice breaker helps the group explore shared interests more broadly and sparks lots of discussion about why each person likes or dislikes their selected five.
- Tell the groups that one person must take notes and be ready to share the highlights of their group discussion with the class upon completion of the assignment.

### Expectation Mapping

- During the first session and after ice breaker session, ask the participants to answer the following question: "What do I expect to learn from this training?"
- Have one of the participants write their contributions on a flip chart sheet.
- Write down your own list of covered material in the training on another flip chart sheet.
- Compare the two sheets, commenting on what will and what will not be covered during the training.
- Set some ground rules for the training sessions. Ask the participants to put these rules on a flipchart and display it in the class.
- You may get back to those sheets once again at the end of the last session of the training.
- Benefits of doing this activity:
  - Participants feel better as their opinions are heard.
  - Participants get to know what they should expect from the training.
  - The facilitator gets to know which points to emphasize, which to leave out, and which to add during the training.
- Expectations from the participants:
  - Must sign the attendance sheet when they arrive for class.
  - Conduct themselves in a positive manner
  - Be punctual, attentive, and participative
- Explain the contents that are going to get covered one by one and connect it with the expectation mapping done earlier.
- By the end of this exercise, the participants should have a clear understanding of what to expect from the session and what are the areas that will not get covered.

### Defining Objectives

- Defining the objectives in the beginning of the units sets the mood for the unit.
- To begin with the end in mind sets the expectations of the participants as what could be the important takeaways from the session.
- It is also a way of making participants take responsibility of their own learning process.
- For the facilitator, the objectives decide a designed path to progress on so that the learning stays aligned and on track.

5. Read the objectives slowly, one by one, and ask the participants to explain what they think it means.
6. At the end of the session, you could again revisit the objectives to find out from the participants about how many objectives have been achieved.

**In order to effectively facilitate this workshop:**

1. You must have thorough knowledge of the material in the Participant Handbook, and be prepared to answer questions about it.
2. You may also wish to read other material to enhance your knowledge of the subject.
3. There may be issues raised with which you are not able to deal, either because of lack of time or knowledge. You can either state that you will obtain answers and get back to the participants with the information. In case the query can be turned to an assignment to the class, do so. You can work with the the participants on the assignment.
4. You must have a very clear understanding of what the participants want to accomplish by the end of the workshop and the means to guide the participants.
5. As the facilitator, it is your responsibility to make sure that all logistical arrangements are made for the workshop. This may involve doing it yourself or confirming that someone else has made all necessary arrangements associated with the workshop. Assume nothing and check everything before the workshop begins.
6. To break the monotony and boredom during sessions, introduce mini breaks in the form of stretching exercises, jokes, some group songs or games.
7. Invite discussion from the participants.
8. Probe the participants further and lead them to come to affirmative conclusions.
9. Let the participants answer. No answer is incorrect.
10. Ask one participant to write all the points on the whiteboard.
11. Build the sessions from the answers provided by the class.
12. Prepare for the sessions in advance so that the resources like flipcharts, handouts, blank sheets of paper, marker pens, etc. can be kept ready.
13. Ensure that resources like board, markers, duster etc. is available before your session starts.

**General instructions for role playing:**

1. You are not being asked to be an actor or to entertain. The purpose of the role play is to provide a situation in which you can practice certain skills.
2. When you read the brief, try to imagine yourself in the situation described and behave in a way you feel to be natural – but be conscious of the fact that your role may require a different approach from that which you might normally use.
3. You (and others) may benefit from the change in approach and behaviour. Therefore, try to use the approach you feel to be most appropriate for the circumstances described in your brief.
4. The brief is just the starting point. It simply sets the scene and the tone of session or activity. Try not to keep referring to the brief as this will affect the spontaneity of the meeting. Allow the role play to develop as you think it might in real life and change your reactions in line with the behaviour and responses of others involved.
5. If you find that you have too little information to answer questions or to describe what has happened in the situation, do feel free to add your own thoughts and ideas. Try to keep these within the framework of the role you are taking and try to make your improvisations as realistic as possible.

## UNIT 12.1: Personal Strengths & Value Systems

### Key Learning Outcomes



At the end of this unit, participants will be able to:

1. Explain the meaning of health
2. List common health issues
3. Discuss tips to prevent common health issues
4. Explain the meaning of hygiene
5. Discuss the purpose of Swacch Bharat Abhiyan
6. Explain the meaning of habit
7. Discuss ways to set up a safe work environment
8. Discuss critical safety habits to be followed by employees
9. Explain the importance of self-analysis
10. Discuss motivation with the help of Maslow's Hierarchy of Needs
11. Discuss the meaning of achievement motivation
12. List the characteristics of entrepreneurs with achievement motivation
13. List the different factors that motivate you
14. Discuss the role of attitude in self-analysis
15. Discuss how to maintain a positive attitude
16. List your strengths and weaknesses
17. Discuss the qualities of honest people
18. Describe the importance of honesty in entrepreneurs
19. Discuss the elements of a strong work ethic
20. Discuss how to foster a good work ethic
21. List the characteristics of highly creative people
22. List the characteristics of highly innovative people
23. Discuss the benefits of time management
24. List the traits of effective time managers
25. Describe effective time management technique
26. Discuss the importance of anger management
27. Describe anger management strategies
28. Discuss tips for anger management
29. Discuss the causes of stress
30. Discuss the symptoms of stress
31. Discuss tips for stress management

## UNIT 12.1.1: Health, Habits, Hygiene: What is Health?

### Unit Objectives

At the end of this unit, participants will be able to:

- Explain the meaning of health
- List common health issues
- Discuss tips to prevent common health issues
- Explain the meaning of hygiene
- Discuss the purpose of Swachh Bharat Abhiyan
- Explain the meaning of habit

### Resources to be Used

- Participant Handbook

### Ask

- What do you understand by the term “Health?”
- According to you, who is a healthy person?

### Say

- Discuss the meaning of health and a healthy person as given in the Participant Handbook.

### Ask

- When did you visit the doctor last? Was it for you or for a family member?

### Say

- Discuss the common health issues like common cold, allergies etc. Refer to the Participant Handbook.
- Let us do a small activity. I will need some volunteers.

### Role Play

- Conduct a small skit with volunteers from the class. Consider one of the villagers has been appointed as a health representative of the village, what measures will you as a health representative suggest to the common villagers to prevent common health issues discussed.
- You will need at least 4 volunteers (Narrator, Health Representative, Head of the Village, Doctor).
- Explain the health concerns of the village to the Narrator. The Narrator will brief the class about the skit.
- Give the group of volunteers, 5 minutes to do discuss.
- At the end of 5 minutes, ask the group to present the skit to the class assuming them as the villagers.
- The class can ask questions to the group as a common villager.

### Summarize

- Through this activity we got some tips on how can we prevent these common health issues.

**Say** 

- Let us now see how many of these health standards we follow in our daily life.

**Activity** 

- Health Standard Checklist from the Participant Handbook.

**Ask** 

- How many of you think that you are healthy? How many of you follow healthy habits?

**Say** 

- Let's do an exercise to find out how healthy you are.
- Open your Participant Handbook section 'Health, Habits, Hygiene: What is Health?', and read through the health standards given.
- Tick the points which you think are true for you.
- Try to be as honest as possible as this test is for your own learning.

**Do** 

- Ensure that all the participants have opened the right page in the Participant Handbook.
- Read aloud the points for the participants and explain if required.
- Give them 5 minutes to do the exercise.
- At the end of 5 minutes, ask the participants to check how many ticks have they got.

**Summarize** 

- Tell them that they need to follow all the tips given in this checklist regularly in order to remain healthy and fit.

**Ask** **Discuss:**

- Is it necessary to practice personal hygiene every day? Why?
- How does a person feel when they do not practice good personal hygiene? Why?
- Can good personal hygiene help a person feel good about his/her self? How?

**Say** 

- Discuss the meaning of hygiene as given in the Participant Handbook.

**Activity** 

- Health Standard Checklist: Hygiene

**Say** 

- Let's do an exercise to find out if we maintain good hygiene habits or not.
- Open the Participant Handbook and read through the Health Standard checklist given.
- Tick the points which you think are true for you.
- Try to be as honest as possible as this test is for your own learning.

**Do** 

- Ensure that all the participants have opened the right page in the Participant Handbook.
- Read aloud the points for the participants and explain if required.
- Give them 5 minutes to do the exercise. .
- At the end of 5 minutes, ask the participants to check how many ticks have they got.
- Ask them to calculate their score.
- Tell them what each score indicates by reading aloud what has been mentioned in the Participant Handbook.

**Ask** 

- How many of you have heard about “Swachh Bharat Abhiyan”?
- Can you tell the class what it is about?

**Summarize** 

- Tell them about Swachh Bharat Abhiyan as given in the Participant Handbook and request them to take a pledge to keep our country clean.

**Ask** 

- What is a habit?

**Say** 

- Discuss some good habits which can become a way of life.

**Summarize** 

- Tell them about good and bad habits and the reasons to make good habits a way of life.

## UNIT 12.1.2: Safety

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss ways to set up a safe work environment
- Discuss critical safety habits to be followed by employees

### Resources to be Used

- Participant Handbook
- Safety signs and symbols
- Safety equipments
- Blank papers
- Pens

### Say

- There are many common safety hazards present in most workplaces at one time or another. They include unsafe conditions that can cause injury, illness and death.
- Safety Hazards include:
  - Spills on floors or tripping hazards, such as blocked aisles or cords running across the floor.
  - Working from heights, including ladders, scaffolds, roofs, or any raised work area.
  - Unguarded machinery and moving machinery parts; guards removed or moving parts that a worker can accidentally touch.
  - Electrical hazards like cords, missing ground pins, improper wiring.
  - Machinery-related hazards (lockout/tag out, boiler safety, forklifts, etc.)

### Team Activity

#### Safety Hazards

- There are two parts to this activity.
- First part will cover the potential safety hazards at work place.
- Second part will cover a few safety signs, symbols and equipments at work place.
- Use this format for the first part of the activity.

PART 1		
Hazard	What could happen?	How could it be corrected?

### Ask

- How could you or your employees get hurt at work?

**Say** 

- Let's understand it better with the help of an activity. You will be given a handout within your groups. You have to think about the possible hazards of your workplace, what damage these hazards could cause and about the corrective action.

**Do** 

- Divide the class into five to six groups of four participants each.
- Put the format on the board for the activity.
- Give blank papers and pens to each group.
- The group is expected to think and discuss the potential safety hazards in the workplace.
- Ask the group to discuss and fill the format using the blank sheet.
- Give the groups 5 minutes for the activity.
- For the second part of the activity, show the class some pictures of safety signs, symbols and equipments.
- Now they will put down a few safety symbols, signs or equipment against the safety hazards identified.
- Give them 5 to 10 minutes to discuss and draw/note it.
- At the end of 10 minutes the groups will present their answers to the class.

**Say** 

- Now, let's discuss the answers with the class.
- All the groups will briefly present their answers.

**Do** 

- Ask the audience to applaud for the group presentation.
- Ask de-brief questions to cull out the information from each group.
- Keep a check on time.
- Tell the group to wind up the discussion quickly if they go beyond the given time limit.

**Ask** **De-briefing**

- What did you learn from the exercise?
- As an entrepreneur, is it important to ensure the safety of your employees from possible hazards? Why?

**Summarize** 

- Ask the participants what they have learnt so far.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the tips to design a safe workplace and non-negotiable employee safety habits.

## UNIT 12.1.3: Self Analysis- Attitude, Achievement Motivation: What is Self Analysis?

### Unit Objectives

At the end of this unit, participants will be able to:

- Explain the importance of self- analysis
- Discuss motivation with the help of Maslow's Hierarchy of Needs
- Discuss the meaning of achievement motivation
- List the characteristics of entrepreneurs with achievement motivation
- List the different factors that motivate you
- Discuss the role of attitude in self- analysis
- Discuss how to maintain a positive attitude
- List your strengths and weaknesses

### Resources to be Used

- Participant Handbook
- Old newspapers
- Blank papers
- Pencils/ pens

### Activity

- This is a paper pencil activity.

What are the three sentences that describe you the best?

What do you need to live happily?

What are your strengths and weaknesses?

### Do

- Write the three questions on the board/ flipchart before the session begins.
- Give plain papers and pencils/ pens to each participant.
- Tell participants to write the answer for the three questions on the paper.
- Tell them the purpose of this activity is not to judge anyone but to understand more about self.

### Say

- Discuss the concept of Self Analysis and motivation with reference to Maslow's Hierarchy of Needs as discussed in the Participant Handbook.

### Team Activity

#### **Tower building**

- Each group which will create tower using the old newspapers.

**Do** 

- Divide the class into groups.
- Give them some old newspapers.
- The task is to create a tower out of the newspapers.
- The group which will create the highest tower standing on its own will be considered the winning group.
- Groups can use as many newspapers as they want to and in any way they want.

**Ask** 

- What did the winning group do differently?
- If you were given a chance, how would you have made the tower differently?
- How did you feel while making the tower?
- Did you feel motivated?

**Say** 

- Discuss the concept of achievement motivation and characteristics of entrepreneurs with achievement motivation as discussed in the Participant Handbook.

**Ask** 

- Is your attitude positive or negative?

**Say** 

- Let me tell you a story :

**It's Little Things that Make a Big Difference.**

There was a man taking a morning walk at the beach. He saw that along with the morning tide came hundreds of starfish and when the tide receded, they were left behind and with the morning sun rays, they would die. The tide was fresh and the starfish were alive. The man took a few steps, picked one and threw it into the water. He did that repeatedly. Right behind him there was another person who couldn't understand what this man was doing. He caught up with him and asked, "What are you doing? There are hundreds of starfish. How many can you help? What difference does it make?" This man did not reply, took two more steps, picked up another one, threw it into the water, and said, "It makes a difference to this one." What difference are we making? Big or small, it does not matter. If everyone made a small difference, we'd end up with a big difference, wouldn't we?

**Ask** 

- What did you learn from this story?

**Activity** **What Motivates You?**

- This is an individual activity.
- It is an exercise given in the Participant Handbook.

**Do** 

- Ask the class to open their Participant Handbook and complete the exercise given in the section What Motivates You?
- Ensure that the participants have opened the correct page for the activity.
- Give the class 5 minutes to complete the activity.

### Say

- Discuss the concept of attitude and how to cultivate a positive attitude as discussed in the Participant Handbook.

### Summarize

- Close the discussion by summarizing how self-analysis, knowledge about what motivates you and your positive attitude can help in your business as well in life.

## UNIT 12.1.4: Honesty & Work Ethics

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the qualities of honest people
- Describe the importance of honesty in entrepreneurs
- Discuss the elements of a strong work ethic
- Discuss how to foster a good work ethic

### Resources to be Used

- Participant Handbook

### Ask

- What do you understand by honesty?
- Why is it important for entrepreneurs to be honest?
- Do you remember any incident where your honesty helped you in gaining confidence?
- Do you remember any incident where someone lost business due to dishonesty?

### Say

- Talk about honesty, qualities of an honest person, and the importance of honesty in entrepreneurs as discussed in the Participant Handbook.
- “Let's understand it better with the help of some case scenarios. You will be given some cases within your groups. You have to analyse the case scenario that has been given to you and then find an appropriate solution to the problem.
- Keep your discussion focussed around the following:
  - What went wrong?
  - Who was at fault?
  - Whom did it impact- the customer or the businessman?
  - How would it impact the business immediately? What would be the long term impact?
  - What could be done?
  - What did you learn from the exercise?

### Do

- Divide the class into four groups of maximum six participants depending on the batch size.
- Give one case study to each group.
- Instruct them to read the case carefully.
- Put down the de-brief questions on the board and ask the groups to focus their discussion around these questions.
- The group is expected to analyse and discuss the case amongst them and find a solution to the given problem. Give the class 5-10 minutes to discuss the case and note down their solutions.
- At the end of 10 minutes the team should present their case solution to the class. The presentation can be a narration or a role play.
- Ask the group to select a group leader for their group. The group leader to discuss and assign roles to the group members for the presentation.

## Team Activity

### Case Study Analysis

#### Scenario 1

Aakash has a small mobile retail sales and repair shop in Allahabad. He has one of the most popular outlets and has great rapport with his customers.

It's around 11 AM when a customer barges in to the shop and starts shouting at Aakash for giving her a faulty instrument. The screen of her mobile is cracked from one side. Aakash remembered thoroughly checking the handset before handing it over to the customer. The customer threatens to sue him and to go to Consumer Court for cheating her. Now, the problem occurred somewhere outside the shop but as other customers were listening to the conversation, it might impact his business. The situation needs to be managed very sensitively. What would you do if you were in Aakash's place?

#### Scenario 2

Rajni does beautiful Phulkari embroidery on suits and sarees. She has a small home-based business. She has a huge list of customers on Facebook and WhatsApp who give her orders regularly. Smita is one of her old and regular customers. As her sister-in-law's wedding was around the corner, Smita wanted to buy few handcrafted Phulkari duppatta. She placed an order for three duppattas via WhatsApp and requested Rajni to send them as soon as possible. When the parcel reached Smita through courier she found that out of the three duppattas, only one was hand embroidered and the other two had machine embroidery on them. Even the length and the quality of the material was not as desired. Smita was heartbroken. It was a complete waste of money and moreover she couldn't wear what she had planned to during the wedding functions. She sent a message to Rajni on WhatsApp, expressing her anger and disappointment.

Smita has also sent a feedback and expressed her disappointment on the social media... this will directly affect Rajni's business. What would you do if you were in Rajni's place?

#### Scenario 3

Shankar is a tattoo artist who has a small tattoo showroom in a big, reputed mall in New Delhi. Mr Saksham had an appointment for today, at 11:00 am but he reached at 11:50 am. Meanwhile, Shankar had to reschedule his next appointment. After availing Shankar's services, Mr Saksham started yelling in an abusive language, refusing to pay the requisite amount, and finding faults in the services provided by him. Who was at fault in this case? What should Shankar do? Should he confront Saksham or give in to the demands of the client?

#### Scenario 4

Shailender is an online cloth reseller who does business through social networking sites such as Facebook and WhatsApp. Priyanka made online payment for a dress to Shailender. But she did not receive the dress for a month. When she asked for a cancellation, Shailender started misleading her. For almost 45 days, he kept promising her that he will pay the amount today, tomorrow, day after etc. Even after repeated calls and messages when she did not receive the payment or the dress, she decided to write a post against him on a popular social media platform. As a result, Shailender lost lots of customers and his flourishing business faced a major crisis. How could this situation have been managed?

## Say

- Now, let's discuss the problem and solution with the larger group.
- The group will first briefly describe the case to the class.
- Then discuss the issue identified and the proposed solution.
- Once the presentation is over, the class can ask their questions.

Do 

- Congratulate each group for the group presentation.
- Ask the audience to applaud for them.
- Ask de-brief questions to cull out the information from each group.
- Keep a check on time. Tell the group to wind up the discussion quickly if they go beyond the given time limit.

Summarize 

- Ask the participants what they have learnt from the exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of honesty and work ethics for entrepreneurs.

## UNIT 12.1.5: Creativity and Innovation

### Unit Objectives

At the end of this unit, participants will be able to:

- List the characteristics of highly creative people
- List the characteristics of highly innovative people

### Resources to be Used

- Participant Handbook
- Chart papers
- Marker pens

### Ask

- You must be aware of the term 'Rags to riches' and heard stories related to the term.
- What do these stories tell us?
- What was so special about these people?

### Say

- Let's have a look at these stories.
- There are some inspiring stories about people which I would like to share with you.
- Narrate these stories to the class.

#### **A.P.J. Abdul Kalam**

Who has not heard of A.P.J. Abdul Kalam: Avul Pakir Jainulabdeen Abdul Kalam hailed from a very humble background. His father was a boat owner. To help his family, Kalam would work as a newspaper vendor. With limited resources, he graduated in Physics and studied aerospace engineering. He was instrumental in India's step towards nuclear energy. In 2002, he became the 11th President of India.

#### **Water filter/purifier at source**

Two young boys studying in classes 4 and 5, from Lingzya Junior High School, Sikkim designed a simple innovative low cost water purifier.

Inspiration behind the idea: Most people today prefer to use a water filter/purifier at their home.

Both the children have given idea to have filter/purifier at the source of water so that everyone has access to clean water without having to make an investment in purchasing a filter/purifier.

Spring's idea is to have a centralised purification system at the point of distribution like water tank while Subash's idea is to have such purifiers attached to public taps.

Source: <http://www.rediff.com/getahead/report/achievers-top-31-amazing-innovations-from-young-indians/20151208.htm>

#### **Solar seeder**

This is a story of a innovative solar seeder and developed by Subash Chandra Bose, a class 8, student from St Sebastiyar Matriculation School, Pudukkottai, Tamil Nadu. Subash has developed a solar powered seed drill, which can undertake plantation for different size of seeds at variable depth and space between two seeds.

Source: <http://www.rediff.com/getahead/report/achievers-top-31-amazing-innovations-from-young-indians/20151208.htm>

**Looms for physically challenged**

Now this is really inspiring of two sisters, Elakkiya a Class 6 student and Pavithra a Class 9 student of SRC Memorial Matriculation, Erode, Tamil Nadu.

The two sisters have come up with loom for lower limbed physically challenged. In their loom they have replaced the pedal operated system with a motor and a gearbox attached to a pulley mechanism.

Source: <http://www.rediff.com/getahead/report/achievers-top-31-amazing-innovations-from-young-indians/20151208.htm>

**Ask** 

- If they can, why can't you?
- Discuss concepts related to 'Creativity and Innovation' with the participants as given in the Participant Handbook.

**Say** 

- Recall the stories on motivation.
- What is the inner drive that motivates people to succeed?
- Let's learn more about such creative and innovative entrepreneurs with the help of an activity.

**Team Activity** 

- This is a group activity.
- Think of any one famous entrepreneur and write a few lines about him or her.

**Activity De-brief**

- Why did you choose this particular entrepreneur?
- What is his/her brand name?
- What creativity does he/she possess?
- What was innovative about their ideas?

**Do** 

- Instruct the participants that this is group work.
- Divide the class into small groups of 4 or 6 depending on the batch size.
- Give each group a chart paper.
- Tell the participants they have to write a few lines about any one famous entrepreneur.
- Give the participants 10 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.
- Ask each group to read out what they have written.
- Ask the de-brief questions.

## Summarize

- Summarize the unit by asking participants if they know of some people who are highly creative and innovative in their approach.
- Ask them to share some experiences about these people with the class.

## Notes for Facilitation

- Source for stories on innovations:

<http://www.rediff.com/getahead/report/achievers-top-31-amazing-innovations-from-young-indians/20151208.htm>

## UNIT 12.1.6: Time Management

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the benefits of time management
- List the traits of effective time managers
- Describe effective time management techniques

### Resources to be Used

- Participant Handbook

### Ask

**Does this sound like you?**

- I can never get enough time to finish what I am doing in a day.
- I have so many things to do that I get confused.
- I want to go for a walk and exercise, but I just do not have the time.
- I had so much to do, so I could not deliver that order on time.
- I would love to start my dream business; but, I just do not have the time.

### Example

- Let's look at these two examples:

#### Example 1:

Ankita works from home as a freelance writer. She says she can easily put in 8 hours of dedicated work in a day. Because she works from home, she saves money on travel and has a comfortable work routine. But there is a challenge and it is distraction. As she works from home, she can easily just get up and sit down on the sofa to watch TV, wasting valuable time. She may have chores to do, errands to run and bills to pay. She ends up working only two to three hours a day and the result is, her work gets piled up. She is unable to take on more work due to this. Even though her quality of work is appreciated her clients are not very happy about the delay in submission.

#### Example 2:

Javed has started a successful online selling company from home and makes a good living from his sales. He has set up a small office space in his living room. As both his parents are working full-time, he also has the role of taking care of his two younger siblings. He almost spends half of his day with the younger kids. He does not mind it but it means taking time away from the work. He is still able to manage his online business with these commitments. He wants to spend some more dedicated hours so as to increase his profits. He also wants to look into new business avenues. What should he be doing.

### Ask

- Does this happen with you too?
- Do you find it difficult to prioritize your work?
- Are you able to manage your time effectively?

## Activity

- Conduct a group discussion based on the above examples.
- Direct the discussion on how to prioritize work and manage time effectively.

## Say

- Time management is not only about how hard you work but also about how smart you work.
- Discuss “What is Time Management” with the participants as given in the Participant Handbook.

## Ask

- Why is it important to manage time? How does it help?
- What happens when you don't manage your time effectively?
- Do you find it difficult to prioritize your work?

## Say

- Discuss the benefits of time management given in the Participant Handbook.
- Let's learn effective time management with the help of an activity.

## Activity

### Effective Time Management

- This activity has two parts:

#### PART 1 TO-DO LIST

- You have to make a to-do list.
- List all of the activities/ tasks that you have to do.
- Try to include everything that takes up your time, however unimportant it may be.
- If they are large tasks, break them into action steps, and write this down with the larger task.
- You can make one list for all your tasks or have separate to-do lists for personal and professional tasks.

#### PART 2 URGENT-IMPORTANT GRID

- You have to make a grid as shown on the board here. .
- This grid has four boxes. As you can see, each box has a different heading.
- At the heart of the urgent-important grid, are these two questions:
  - ♦ Is this task important?
  - ♦ Is this task urgent?
- Now, you have to think about each activity that you have written in your to-do list and put it into one of the four categories.
- **What do these categories depict?**
- **Category 1: Urgent/Important**
  - ♦ This category is for the highest priority tasks. They need to get done now.

- **Category 2: Not Urgent/Important**
  - This is where you want to spend most of your time.
  - This category allows you to work on something important and have the time to do it properly.
  - This will help you produce high quality work in an efficient manner.
  - The tasks in this category are probably the most neglected ones, but also the most crucial ones for success.
  - The tasks in this category can include strategic thinking, deciding on goals or general direction and planning – all vital parts of running a successful business.
- **Category 3: Urgent/Not Important**
  - This is where you are busy but not productive. These tasks are often mistaken to be important, when they're most often busywork.
  - Urgent but not important tasks are things that prevent you from achieving your goals.
  - However, some may be activities that other people want you to do.
- **Category 4: Not Important and Not Urgent**
  - This category doesn't really include tasks, but rather habits that provide comfort, and a refuge from being disciplined and rigorous with your time management.
  - Some may be activities that other people want you to do.
  - These might include unplanned leisure activities as well.

**TO- DO list format**

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15.	

**URGENT-IMPORTANT GRID**

<p><b>URGENT/ IMPORTANT</b></p> <ul style="list-style-type: none"> <li>• Meetings</li> <li>• Last minute demands</li> <li>• Project deadlines</li> <li>• Crisis</li> </ul>	<p><b>NOT URGENT/ IMPORTANT</b></p> <ul style="list-style-type: none"> <li>• Planning</li> <li>• Working towards goals</li> <li>• Building relationship</li> <li>• Personal commitments</li> </ul>				
<table border="1"> <tr> <td style="width: 30px; height: 30px; text-align: center;">1</td> <td style="width: 30px; height: 30px; text-align: center;">2</td> </tr> <tr> <td style="width: 30px; height: 30px; text-align: center;">3</td> <td style="width: 30px; height: 30px; text-align: center;">4</td> </tr> </table>	1	2	3	4	
1	2				
3	4				
<ul style="list-style-type: none"> <li>• Interruptions</li> <li>• Phone calls/ E-mails</li> <li>• Other people's minor demands</li> </ul> <p><b>URGENT/ NOT IMPORTANT</b></p>	<ul style="list-style-type: none"> <li>• Internet surfing</li> <li>• Social media</li> <li>• Watching TV</li> </ul> <p><b>NOT URGENT/ NOT IMPORTANT</b></p>				

**URGENT/ IMPORTANT GRID format**

<p><b>URGENT/ IMPORTANT</b></p>	<p><b>NOT URGENT/ IMPORTANT</b></p>				
<table border="1"> <tr> <td style="width: 30px; height: 30px; text-align: center;">1</td> <td style="width: 30px; height: 30px; text-align: center;">2</td> </tr> <tr> <td style="width: 30px; height: 30px; text-align: center;">3</td> <td style="width: 30px; height: 30px; text-align: center;">4</td> </tr> </table>	1	2	3	4	
1	2				
3	4				
<p><b>URGENT/ NOT IMPORTANT</b></p>	<p><b>NOT URGENT/ NOT IMPORTANT</b></p>				

**Do** 

- Put down the formats for the to-do list and the urgent/important grid on the board.
- Instruct the participants to prepare their to-do list first.
- Give the participants 10 minutes to prepare the list.
- Once done, instruct them to divide the tasks in to-do list into the four categories.
- Explain the four categories to the participants giving examples specific to their context.
- As you explain the categories fill the grid with the type of tasks.
- Give the participants 40 minutes to fill the grid.
- Then explain how to balance the tasks between the four categories.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

**Say** **Activity De-brief:****How can we balance tasks between the four categories?****How to manage time through this grid?**

- **Category 1: Urgent/Important**
  - Try to keep as few tasks as possible here, with the aim to eliminate.
  - If you spend too much of your time in this category, you are working solely as a trouble shooter, and never finding time to work on longer-term plans.
- **Category 2: Not Urgent/Important**
  - Plan these tasks carefully and efficiently as they are most crucial ones for success.
  - If necessary, also plan where you will do these tasks, so that you're free from interruptions.
  - Include strategic thinking, deciding on goals or general direction and planning in your planning process.
- **Category 3: Urgent/Not Important**
  - Ask yourself whether you can reschedule or delegate them.
  - A common source of such activities is other people. Sometimes it's appropriate to say "no" to people politely, or to encourage them to solve the problem themselves.
- **Category 4: Not Important and Not Urgent**
  - You also want to minimize the tasks that you have in this category.
  - These activities are just a distraction – avoid them if possible.
  - You can simply ignore or cancel many of them.
  - Politely say "no" to work assigned by others, if you can, and explain why you cannot do it.
  - Schedule your leisure activities carefully so that they don't have an impact on other important tasks.
- Discuss the traits of effective time managers and effective time management techniques as given in the Participant Handbook.

**Summarize** 

- Discuss the traits of effective time managers and effective time management techniques as given in the Participant Handbook.

## Notes for Facilitation

- Here is a short story. You can conclude the session narrating the story. To make it more interesting you can perform the demonstration described and discuss the short story.
  - ♦ One day an expert in time management was speaking to a group of students. As he stood in front of the group, he pulled out a large wide-mouthed glass jar and set it on the table in front of him. Then he took out a bag of about a dozen rocks and placed them, one at a time, into the jar. When the jar was filled to the top and no more rocks would fit inside, he asked, "Is this jar full?" Everyone in the class said, "Yes." Then he said, "Really?"
  - ♦ He reached under the table and pulled out a bucket of gravel (small stones). He dumped some gravel in and shook the jar causing pieces of gravel to work themselves down into the space between the rocks. Then he asked the group once more, "Is the jar full?" By this time, the class began to understand. "Probably not," one of them answered. "Good!" he replied.
  - ♦ He reached under the table and brought out a bucket of sand. He started dumping the sand in the jar and it went into all of the spaces left between the rocks and the gravel. Once more he asked the question, "Is this jar full?" "No!" the class shouted. Once again he said, "Good." Then he grabbed a jug of water and began to pour it in until the jar was filled to the brim. Then he looked at the class and asked, "What is the point of this illustration?" "One student raised his hand and said, "No matter how full your schedule is, if you try really hard you can always fit some more things in it!" "No," the speaker replied, "that's not the point. The truth this illustration teaches us is: If you don't put the big rocks in first, you'll never get them in at all." What are the 'big rocks' in your life? Your children; your loved ones; your education; your dreams; a worthy cause; teaching or mentoring others; doing things that you love; time for yourself; your health; your mate (or significant other). Remember to put these BIG ROCKS in first or you'll never get them in at all. If you sweat about the little stuff (the gravel, sand, and water) then you'll fill your life with little things you worry about that don't really matter, and you'll never have the time you need to spend on the big, important stuff (the big rocks).
- End the story with these lines...

So, tonight, or in the morning tomorrow, when you are reflecting on this short story, ask yourself this question: What are the 'big rocks' in my life? Then, put those in your jar first

## UNIT 12.1.7: Anger Management

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the importance of anger management
- Describe anger management strategies
- Discuss tips for anger management

### Resources to be Used

- Participant Handbook

### Ask

- What is anger? Is anger good or bad?
- Is anger normal or an abnormal behaviour? How can anger harm you?
- Why is it important for entrepreneurs to manage their anger?

### Say

- Talk about anger and the importance of anger management in entrepreneurs as discussed in the Participant Handbook.
- Let us do a small activity. This is an individual activity.
- Think of the incidents and situations that angered you and hurt you.

### Do

- Instruct them to note down these situations under different categories (as given in the Activity).
- Give the class 3-5 minutes to think and note down their answers.
- At the end of 5 minutes, ask some participants to volunteer and present their answers.
- They can also share these situations with their fellow participants if they do not wish to share it with the entire class.

### Activity

- Do you remember any incident which has hurt
  - ♦ you physically
  - ♦ you mentally
  - ♦ your career
  - ♦ your relationships.

### Ask

- Do you ever get angry?
- What are the things that make you angry?
- Do you remember any incident where your anger management helped you in maintaining healthy relationship?
- Do you remember any incident where someone lost business/ friend/ relationship due to temper (anger)?

## Say

- There are a few strategies which can help in controlling your anger. Let's do an activity to understand the anger management process better.
- This is an individual activity.
- Think of the incidents/ situations which trigger your anger (the cause).
- Then think what happened as a result of your anger (the effect).
- You need to come up with some techniques to manage your anger.

## Do

- Give the class the anger triggers (the cause) as listed in the activity.
- Put down the activity format (Anger Triggers, Result of your Anger, Anger Management Techniques) on the board and instruct the class to write the answers under different categories.
- Give the class 3-5 minutes to think and note down their answers.
- At the end of 5 minutes, ask the participants who wish to volunteer and present their answers.

## Activity

Trigger points and Anger Management Techniques Activity

### Anger Triggers

List of triggers that make you angry:

Someone says you did something wrong.

You want something you can't have now.

You get caught doing something you shouldn't have been doing.

You are accused of doing something you didn't do.

You are told that you can't do something.

Someone doesn't agree with you.

Someone doesn't do what you tell him to do.

Someone unexpected happens that messes up your schedule.

### Result of your anger:

Write the techniques that you use to manage your anger:

### Anger Management Techniques

## Say

- Now, let's discuss the problems and solution with all.
- The individual will first briefly describe trigger points to the class.
- Then discuss the result of the anger. Other participants are requested to remain quiet while one is making the presentation.
- Post presentation, other participants may ask questions.

## Do

- Congratulate each individual for sharing their points.
- Ask the audience to applaud for them.
- Ask de-brief questions after the presentation to the class.
- Keep a check on the time. Ask the participants to wind up the activity quickly if they go beyond the given time limit.

## Ask

### De-brief questions:

- In the situation described by the presenter, who was at fault?
- How could you have handled this situation alternatively?

## Summarize

- Close the discussion by summarizing the strategies and tips of anger management for entrepreneurs.
- Ask the participants what have they learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

## Notes for Facilitation

- Encourage the participants to share information about them while presenting the situations to the class.
- Keep the format of the Activity prepared in a chart paper so that it can be displayed during the session.

## UNIT 12.1.8: Stress Management: What is stress?

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the causes of stress
- Discuss the symptoms of stress
- Discuss tips for stress management

### Resources to be Used

- Participant Handbook

### Ask

- You are waiting in the reception for an interview or a very important meeting, suddenly your legs are shaky, your hands are cold, you are feeling nervous. Have you ever been in this kind of situation?
- Have you had days when you had trouble sleeping?
- Have you ever been so worried about something that you ended up with a terrible headache?

### Say

- You've probably heard people say, "I'm really stressed out" or "This is making me totally stressed."

### Ask

- What do you understand by stress?
- What gives you stress?
- How do you feel when you are stressed or what are the symptoms of stress?
- How can stress harm you?
- Why is it important for entrepreneurs to manage stress?

### Say

- When we feel overloaded or unsure of our ability to deal with certain challenges, we feel stressed.
- Discuss about stress, causes of stress, and symptoms of stress as discussed in the Participant Handbook.
- Let's understand the causes of stress and how to deal with them with the help of some case scenarios.
- You will be given some cases.
- You have to analyse the case scenario and then find an appropriate solution to the problem.
- This will be a group activity.

### Do

- Divide the class into four groups of 5- 6 participants (depending on the batch size).
- Assign one case scenario to each group.
- Instruct them to read the case carefully.
- The group is expected to analyse and discuss the case amongst them and find a solution to the given problem.
- Explain their discussion should result in getting answers for the following questions:

- What was/were the cause(s) of stress?
- Was the stress avoidable or manageable under the given circumstances?
- If yes, how do you think that the stress could be avoided (managed)?
- If no, then why not?
- Give the class 10-12 minutes to discuss the case and note down their solutions.
- At the end of 12 minutes, the team should present their case solution to the larger group.
- Ask the group to select a group leader for their group.
- The group leader to discuss and assign roles to the group members for the presentation.

## Team Activity

### Case Study Analysis

#### Scenario 1

Akash's alarm doesn't go off and he gets late getting out of the house. He hits traffic and ends up 15 minutes late to work, which his boss notices. He gets to his desk and finds he has to complete 2 reports in next one hour. Just when he is about to begin work, a message pops up "Telecon with the client begins in 10 minutes. Please be in the conference room in 5 minutes."

He is not prepared for the call. He is stressed. He does not want to speak to his boss about this. He is stressed, feeling uncomfortable and sick. Not in a position to attend the call or finish the reports on time.

#### Scenario 2

While paying his overdue bills, Rahul realised that it's the middle of the month and he has only Rs 500 left in his account. He has already asked all of his friends, and family for loans, which he hasn't paid back yet. He is still contemplating over the issue when his phone rings. His sister's birthday is due next week and she has seen a beautiful dress which she wants to buy but cannot tell the parents as it is a bit expensive. She wishes if Rahul could buy the dress for her. Rahul has promised to buy her the dress for her birthday.

Rahul is stressed, does not understand what to do. He is unable to concentrate on his work and unable to complete the tasks assigned. His team leader has already warned him of the delay.

#### Scenario 3

Sheela calls the cable company as she has unknown charges on her bill. She has to go through the automated voice mail menu three times and still can't get through to a customer care executive. After 15 minutes of repeated efforts, her call is answered. She explains the entire issue to the customer care executive but before the person could suggest a way out, the call drops.

Now Sheela has to call back and repeat the whole process all over again with a new customer care executive. She is very angry and calls again but cannot connect this time.

She has to leave to office so she decides to call from office and check. When she connects this time she is angry and argues with the executive on the call. All her co-workers around are looking at her as her volume has suddenly increased. She bangs the phone and ends the call.

Her co-worker Neelam enquires what has happened to her. She ignores her and just walks off. She has become irritable and her behaviour and tone with other co-workers is not acceptable.

**Scenario 4**

Arpit is a young entrepreneur who started doing business through Facebook few weeks back. He had always been into a job. Although Arpit has very few financial liabilities, it wasn't an easy decision to leave a comfortable job at once and look for newer pastures. Arpit's boss warned him of the consequences and the challenges of starting a business when nobody ever in his family had been in business.

He has not been able to get a good deal till now. This is an important life shift for him which comes with unknown variables. Arpit is nervous and is wondering if he has what it takes to fulfill the requirement of his new role, or the new experiences he's likely to face.

**Ask** **De-brief questions:**

- What was/ were the cause(s) of stress?
- Was the stress avoidable or manageable under the given circumstances?
- If yes, how do you think that the stress could be avoided (managed)?
- If no, then why not?

**Say** 

- Now, let's discuss the problem and solution with the larger group.
- The group will first briefly describe the case to the class.
- Then discuss the issue identified and the proposed solution.
- Post presentation, the other groups may ask questions to the group that has presented.

**Do** 

- Congratulate each group for sharing their points.
- Ask the audience to applaud for them.
- Ask de-brief questions to cull out the information from each group.
- Keep a check on time. Tell participants to wind up the discussion quickly if they go beyond the given time limit.

**Say** 

- While it is common and normal to feel some tension. This feeling nervous and tensed can interfere with your thinking process and can have a negative impact on your performance.
- Stress can deplete the most vibrant of souls. It can have a negative effect on every aspect of a person's life including their health, emotional well-being, relationships, and career. However, one needs to understand the causes and types of stress before looking for ways to manage it.

**De-brief:****Scenario 1**

The cause of stress was lack of time management and the habit of procrastinating. If Akash would have managed his time well, planned alternate ways to get up on time, finished prior tasks on time and planned for client meetings in advance then he wouldn't have faced stress.

**Scenario 2**

The cause of stress was lack of financial planning. Rahul should have planned his financial resources well in advance and saved some money for the rainy day. Also, differentiating between needs and wants and keeping a check on non-essential expenditure would have saved Rahul from this situation.

**Scenario 3**

Sometimes, stress is caused due to external factors instead of internal ones. In this case, the stress was unavoidable because we have no control over this customer care system. Every time, you will get in touch with a new executive and will have to explain all over again. This might cause stress but despite being frustrated and angry there is little that we can do about it. All Sheela could do was to find ways to calm herself down through some breathing exercises and meditation, reading some good book or listening to music and then start afresh.

**Scenario 4**

A positive, major life change can be a source of good stress. Regardless of how good the change is, it can be stressful. Stress caused by a positive and major life change can be beneficial because it causes a person to step out of their comfort zone and learn new skills. Here, Arpit may become a successful entrepreneur or learn new ways to do things differently.

Now let us see this scenario, can I have a volunteer to read out this case to the class.

**Do** 

- Ask one of the participant who can volunteer and read out this scenario to the class.

**Scenario 5**

Rakesh lives in Kathmandu with his wife and two beautiful daughters Sarah and Sanya. Nepal was hit by a massive earthquake and Rakesh's building collapsed during the earthquake. During evacuation, Rakesh realised that though his wife and Sarah were fine and suffered only minor bruises, Sanya was nowhere in the scene. Panic stricken, he started calling her name and searching her frantically. A little later, he heard a meek voice from beneath the debris. He quickly removed the rubble to find a huge bed. Rakesh was pretty sure that Sanya was trapped underneath. Though he was badly bruised, he gathered all his courage and with all his might, he lifted the several-ton bed to save Sanya's life. Everyone was relieved to see Sanya alive and also extremely surprised to see this father's ability to access superhuman strength.

- Ask the audience to applaud for the participant after the scenario is read completely.
- Discuss the scenario, ask de-brief questions:
  - What kind of stress was Rakesh undergoing in this case?
  - Was the stress avoidable or manageable under the given circumstances?
  - What was the result of the stress?

**Say** **De-brief:**

- Not all stress is harmful; good stress is actually energizing. This was a case of lifesaving stress, or hero stress, which is an important example of good stress. You may have heard stories in which a person performs an impossible feat of physical strength in order to save their life or the life of someone they love. This type of stress causing a surge of adrenaline is good for us.

## Summarize

- Close the discussion by summarizing the tips to manage stress as given in the Participant Handbook.
- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

## Notes for Facilitation

- Keep printed copies of the activities/ scenarios ready for the session.
- Put down the de-brief questions on a flip chart so that it can be displayed in the class during the activity.
- Encourage participation and make the discussions interactive.





## UNIT 12.2: Digital Literacy: A Recap

### Key Learning Outcomes



At the end of this unit, participants will be able to:

1. Identify the basic parts of a computer
2. Identify the basic parts of a keyboard
3. Recall basic computer terminology
4. Recall the functions of basic computer keys
5. Discuss the main applications of MS Office
6. Discuss the benefits of Microsoft Outlook
7. Identify different types of e-commerce
8. List the benefits of e-commerce for retailers and customers
9. Discuss Digital India campaign will help boost e-commerce in India
10. Describe how you will sell a product or service on an e-commerce platform

## UNIT 12.2.1: Computer and Internet Basics: Basic Parts of a Computer

### Unit Objectives

At the end of this unit, participants will be able to:

- Identify the basic parts of a computer
- Identify the basic parts of a keyboard
- Recall basic computer terminology
- Recall the functions of basic computer keys

### Resources to be Used

- Participant Handbook
- Computer Systems with the required applications

### Say

- Let's take a quick recap of the basic computer parts.
- Discuss 'Basic Parts of Computer' and 'Basic Parts of a Keyboard' with the class as given in the Participant Handbook.

### Explain

- Explain all the parts of the computer and the keyboard by demonstrating on the real system.

### Ask

- Do you know about internet?
- Have you ever used internet?
- Why do you think internet is useful?
- What was the last task you performed on internet?

### Say

- Let's look at some basic internet terms.
- Discuss 'Basic Internet Terms' with the participants as given in the Participant Handbook.

### Summarize

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of computer and internet for entrepreneurs.

## Practical

- Conduct a practical session.
- Ask the participants to assemble in the computer lab.
- Give some hands on practice exercises.

## Do

- Group the participants for the activity depending on the batch size and the number of computer systems available in the lab.
- Explain the purpose and duration of the activity.
- Ensure the participants complete the practical exercises assigned.

## UNIT 12.2.2: MS Office and Email: About MS Office

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the main applications of MS Office
- Discuss the benefits of Microsoft Outlook

### Resources to be Used

- Participant Handbook
- Computer Systems with MS Office

### Ask

- What is the most frequent activity that you do on the computer?
- Do you know how to make presentations on the computer?

### Say

- Give a brief introduction of MS Office as given in the Participant Handbook.
- Discuss the most popular office products. Explain in brief their application, benefits and working.
- **Microsoft Word** is a word processing program that allows for the creation of documents. The program is equipped with templates for quick formatting. There are also features that allow you to add graphics, tables, etc.
- **Microsoft Excel** is a tool for accounting and managing large sets of data. It can also simplify analysing data. It is also used to create charts based from data, and perform complex calculations. A Cell is an individual data box which will have a corresponding Column and Row heading. This gives the cell a name, referred to as the Cell Reference. There can be multiple pages in each workbook. Each page, or sheet, is called a Worksheet. When you open a new Excel file, it automatically starts you with three worksheets, but you can add more.

### Explain

- Explain the working and frequently used features of Office on a real system.

### Ask

- What do you know about e-mails?
- Do you have an email id?
- How often do you check your e-mails?

### Say

- Communication is vital for every business. The fastest and the safest way to communicate these days are through emails. MS Outlook helps to manage your emails in a better way and also offers a host of other benefits.
- Discuss “Why Choose Microsoft Outlook?” with the participants as given in the Participant Handbook.

**Do** 

- Ask the participants to assemble in the computer lab.
- Explain the working of Outlook on a real system..

**Demonstrate** 

- Demonstrate how to create email id.
- Demonstrate how to write new mails, send mails.
- Demonstrate how to use MS Office application to create a letter and send it as attachment in an email.
- Demonstrate how to use other MS Office applications.

**Practical** 

- Give some hands on practice exercises
- Group the participants for the activity depending on the batch size and the number of computer systems available in the lab.
- Explain the purpose and duration of the activity.

**Summarize** 

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

## UNIT 12.2.3: E-Commerce

### Unit Objectives

At the end of this unit, participants will be able to:

- Identify different types of e-commerce
- List the benefits of e-commerce for retailers and customers
- Discuss Digital India campaign will help boost e-commerce in India
- Describe how you will sell a product or service on an e-commerce platform

### Resources to be Used

- Computer System with internet connection
- Participant Handbook

### Ask

- How many of you have done shopping online?
- Can you name at least five shopping websites?
- What is the product that you most frequently buy online?
- Why do you do shopping online instead of going to the market?

### Say

- Give a brief introduction of “What is E-commerce”. Refer to the Participant Handbook.
- E-commerce emerged in the early 1990s, and its use has increased at a rapid rate. Today, many companies sell their products online. Everything from food, clothes, entertainment, furniture and many other items can be purchased online.

### Ask

- What other types of transactions have you performed on the internet other than buying products?

### Say

- Give examples of e-commerce activities from Participant Handbook.

### Team Activity

#### E-commerce examples

- Instruct the participants to list some of the payment gateways that they have used for e-commerce activities.
- Give them 5 minutes to make this list.
- Discuss payment gateways and transaction through payment gateways.
- Conclude the discussion by mentioning how important e-commerce has become in our day to day transactions.

**Say** 

- E-commerce activities can be classified based on the types of participants in the transaction.
- Discuss “Types of E-commerce” from the Participant Handbook.

**Do** 

- Discuss all types of E-commerce by giving examples and names of some popular websites which use them.
- Make the discussion interactive by asking the class to share some popular e-commerce sites of each type.

**Say** 

- E-commerce activities bring a host of benefits for both, retailers and customers.
- Discuss benefits of E-commerce from the Participant Handbook.

**Explain** 

- The majority of the population that uses E-commerce activities lives in tier-1 and tier-2 cities. To encourage the use of digital money in tier-3 and 4 areas, PM Mr. Modi launched the “Digital India Campaign”.
- Discuss “Digital India Campaign” from the Participant Handbook.
- By Digital India project the government will deliver services via mobile connectivity and in doing so, is expected to bring the internet and broadband to remote corners of the country. This connectivity will in turn enhance e-commerce activities also. Furthermore, the Indian Government is also modernizing India Post and aims to develop it as a distribution channel for e-commerce related services.

**Say** 

- Now let us discuss how to sell a product using E-commerce.
- Every product has to be sold on a platform on the internet. Think of it as a shop that you have to sell your product. Now this shop can be your own or shared or rented. If the shop is your own or rented there will be only your products in that shop. If the shop is shared, there will be products of multiple sellers in that shop. A common example is a departmental store which has products from multiple brands in the shop.
- Similarly, in E-commerce the shop is the website where your products are displayed. If it is your own website it will exclusively showcase your products. In this case the cost that you will incur will be:
  - ♦ Developing the website
  - ♦ Hosting the website
  - ♦ Maintenance of the website
- If you rent a website it will also showcase your own products but the development, hosting and maintenance parts goes to the owner. This saves time and the cost to manage these activities.
- Smaller companies usually go for renting a website and the bigger ones develop their own website.
- The concept of shared platforms has become very popular in recent times. In this platform the sellers have to register and then they can sell their goods on a common platform. Among the most popular of these are Amazon, Myntra, Flipkart, etc.

**Role Play** 

- Tell the participants to choose a product or service that they want to sell online.
- Tell them to write a brief note explaining how they will use existing e-commerce platforms, or create a new e-commerce platform to sell their product or service.

**Ask** 

- How much money are you carrying in your wallet?
- Do you have a credit/debit card?
- How do you make payments while doing online shopping?

**Say** 

- Demonetization has made carrying cash in the wallet very difficult. People either shop through cards or some other form of digital money.
- So what do you think is digital money?
- In this form the money is both paid and received digitally. There is no hard cash involved. It is an instant and convenient way to make payments.
- There are various types of digital payments. Let us discuss some of them in brief here.
- The first one is the most commonly used system i.e. the cards. Debit card, credit card, prepaid card, all fall under this category.
- Then is the e-wallet or the mobile wallet. This has become the most used form of digital money after demonetization. Examples are Paytm, state bank buddy, Freecharge, etc.
- Many other forms of digital money are also coming up in market like mobile apps, Aadhar card based payment, etc.

**Do** 

- Demonstrate how to make and receive payments through digital models like Paytm and state bank buddy.

**Ask** 

- Why do you think people have started using digital money instead of hard cash? Is demonetization the only reason?

**Say** 

- Digital money gives a lot of advantages over the conventional hard cash. Some of them are:
  - ♦ Digital payments are easy and convenient. You do not need to take loads of cash with you, a mobile phone or a card will suffice.
  - ♦ With digital payment modes, you can pay from anywhere anytime.
  - ♦ Digital payments have less risk.

**Summarize** 

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of e-commerce and digital money.





## UNIT 12.3: Money Matters

### Key Learning Outcomes

At the end of this unit, participants will be able to:

1. Discuss the importance of saving money
2. Discuss the benefits of saving money
3. Discuss the main types of bank accounts
4. Describe the process of opening a bank account
5. Differentiate between fixed and variable costs
6. Describe the main types of investment options
7. Describe the different types of insurance products
8. Describe the different types of taxes
9. Discuss the uses of online banking
10. Discuss the main types of electronic funds transfer

## UNIT 12.3.1: Personal Finance – Why to Save?

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the importance of saving money
- Discuss the benefits of saving money

### Resources to be Used

- Participant Handbook

### Ask

- How many of you save money?
- Why do you feel the need to save it?
- Do you plan your savings?
- Where do you keep the money you save?
- How do you use the money that you have saved?

### Example

- Let's look at these two examples:

#### Example 1:

Suhani works in a good company and earns Rs.30,000 month. She always saves 5000 per month and keeps it aside as a personal saving. She keeps the money at home and has saved quite a lot. One day her mother has a medical emergency and has to be taken to the hospital. Her family is worried about the amount they have to spend for the treatment. It will cost them atleast 40,000.

Suhani says tells her family not to worry and that she has about 50,000, which she has saved over the months.

#### Example 2:

Jasmeet works in the same company and earns the same as Suhani. She is very fond of shopping and spends most of her money on buying new clothes. At the end of the month, she is always asking her father for money as her pay is finished.

### Ask

- Who do you identify with –Suhani or Jasmeet ?
- How do you think Suhani manages to save money which Jasmeet is unable to do?

### Say

- We should always set aside some and save some money from our monthly pay. The future is unpredictable. Saving money not only gives you a sense of financial security but it can be used in case of emergencies.
- Discuss “Importance of Saving” with the participants as given in the Participant Handbook.

### Ask

- What are the benefits of saving money?
- What does being financially independent mean to you?

## Say

- Discuss “Benefits of Saving” with the participants as given in the Participant Handbook.
- Now let us continue with Suhani's story. Suhani has told her family not to worry and that she has about 50,000, which she has saved over the months. The family is happy about Suhani's decision of saving money, which will be of great help for them now.

Suhani is going to the hospital today to pay the first instalment for the treatment. Suddenly finds only 35,000 in her cash box when she counts and does not remember using it. She has not kept any record and now she is upset.

## Ask

- Was it a good decision by Suhani to save a part of her earnings every month?
- Was it a wise decision to keep all her savings as cash in a cash box?
- Could she have managed to save money in a better and more effective manner?
- Do you want to learn how to save money and use it effectively?

## Say

- Let's learn personal saving with the help of a group activity.

## Team Activity

### Personal Finance- Why to save

- This activity has two parts:

#### PART 1

#### WAYS TO SAVE MONEY

- You are earning 30,000/- per month. You have recently changed your job and have to move to a metropolitan city. You are now living as a paying guest paying 10,000/- per month. Your other estimated expenditures like travel, food, recreation would be around Rs. 17, 000 per month.
- Make a list of different ways to save money.

#### PART 2

#### HOW WILL YOU USE THE MONEY

- After a year how much have you been able to save?
- How will you use the money that you have saved?

## Do

- Divide the class into groups of four.
- Instruct the participants to think and prepare a list of the various ways they can save money.
- Give the participants 10 minutes to prepare the list.
- Once done, instruct them to think of how they could use the money they have saved.
- Give the participants 10 minutes to prepare the list.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

### Activity De-brief

- What were the different ways you could save money?
- How much money were you able to save?
- How will you use the money you have saved in one year?

## Say

- Discuss the importance of personal finance and why it is important to save money.

## Summarize

**You can summarize the session by discussing:**

- The importance of saving money.
- Ways to save money.
- How the money saved can be used for different purposes.

## UNIT 12.3.2: Types of Bank Accounts, Opening a Bank Account

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the main types of bank accounts
- Describe the process of opening a bank account

### Resources to be Used

- Account opening sample forms
- Participant Handbook

### Ask

- How many of you save money?
- Where do you keep the money you save?
- How many of you have a bank account?
- What type of account do you have?

### Example

- Let's look at the given example:

Reena is in the third year of college but in the evening she gives tuitions for children living in her colony. She earns 15,000/- per month. As her students stay in different parts of the city, she has to walk a lot.

To save time, she decides to buy a second hand scooter for herself. But she has to save money for it. Her class mate advises her to open a recurring deposit account in the bank.

She goes to the bank close to her home. The personal manager gives her some forms to fill. She is confused as she has never done this before. Her elder sister has an account in the same bank. She asks for help from her sister. She goes to the bank the next day with her sister. The personal banker gives her a list of documents that she will need to submit with the form for opening an account. The banker advises her to open a 6 months recurring deposit.

### Ask

- Do you try to save money monthly but have to spend it on unforeseen expenditure?
- Have you ever thought of depositing your savings in a bank?

### Say

- Before opening a bank account, you need to know the types of accounts we have in India.
- Discuss "Types of Bank Accounts" with the participants as given in the Participant Handbook.

### Ask

- Can someone say what are the different types of bank accounts?

**Say** 

- Let's learn about the different types of bank accounts through an activity.

**Team Activity** 

- Divide the class in four groups.
- Label the groups as savings account, current account, recurring account and fixed deposit.
- On a chart paper, ask them to write the key points of their account.

**Activity De-brief**

- Ask each group to present the key points of their account.

**Say** 

- Now that you know about the four different types of accounts, let's learn how to open a bank account.
- Discuss "Opening a Bank Account" with the participants as given in the Participant Handbook.
- Discuss "Tips" that the participants should keep in mind while opening a bank account as given in the Participant Handbook.

**Ask** 

- What are the main documents required for opening a bank account?
- What are some important points to ask the bank personnel while opening an account?

**Say** 

- Mention officially valid KYC documents (refer to the Participant Handbook)
- Now, let's understand the procedure of opening a bank account through an activity.

**Team Activity** **Opening a Bank Account**

- This activity is done in groups.
- Divide the class in groups of four or six.

**PART 1****FILLING A BANK ACCOUNT OPENING FORM**

- You have to fill a bank opening form.
- You can refer to the section "Opening a Bank Account" of your Handbook for reference.
- List all the steps that you will be required to fill in the form.
- List the documents that you needs for filling the form.
- Now fill in the form.

**Activity De-brief****How did you design the form?**

- What all details did you fill in the form?
- What were your KYC documents?
- How would this activity help you in future?

Do 

- Instruct the participants to read the section "Opening a Bank Account" of the Participant Handbook.
- Give each group one sample account opening form.
- Give the participants 5 minutes to read the form.
- Give them 15 minutes to fill it.
- Assist them by explaining each category and how to fill it.
- Keep a check on time.
- Tell the group to wind up quickly if they go beyond the given time limit.

Summarize **Note:**

- You can summarize the unit through a role play.
  - ♦ A person wanting to open an account in the bank.
  - ♦ What is the procedure that he will go through?
  - ♦ Discuss the key points of different types of bank accounts.
  - ♦ How to select the type of account
  - ♦ How to fill the account opening form.
- A sample account opening form is given in the following page for reference. Use it for the activity in the class.

**Sample Bank Account Opening form.**

<b>Photograph</b>	XXX Bank			
SAVING BANK ACCOUNT OPENING FORM				
Account No.: _____	Date: _____			
Name of the Branch				
Village/Town				
Sub District / Block Name				
District				
State				
SSA Code / Ward No.				
Village Code / Town Code	Name of Village / Town			
<b>Applicant Details:</b>				
Full Name	Mr./Mrs./Ms.	First	Middle	Last Name
Marital Status				
Name of Spouse/Father				
Name of Mother				
Address				
Pin Code				
Tel No. Mobile			Date of Birth	
Aadhaar No.			Pan No.	
MNREGA Job Card No.				
Occupation/Profession				
Annual Income				
No. of Dependents				

<b>Detail of Assets</b>	Owning House : Y/N	Owning Farm : Y/N		
	No. of Animals :	Any other :		
<b>Existing Bank A/c. of family members / household</b>	Y / N	If yes, No. of A/cs. _____		
<b>Kisan Credit Card</b>	Whether Eligible	Y / N		
I request you to issue me a <b>Rupay Card</b> .				
I also understand that I am eligible for an Overdraft after satisfactory operation of my account after 6 months of opening my account for meeting my emergency/ family needs subject to the condition that only one member from the household will be eligible for overdraft facility. I shall abide by the terms and conditions stipulated by the Bank in this regard.				
<b>Declaration:</b>				
I hereby apply for opening of a Bank Account. I declare that the information provided by me in this application form is true and correct. The terms and conditions applicable have been read over and explained to me and have understood the same. I shall abide by all the terms and conditions as may be in force from time to time. I declare that I have not availed any Overdraft or Credit facility from any other bank.				
<b>Place:</b>				
<b>Date:</b>	<b>Signature / LTI of Applicant</b>			
<b>Nomination:</b>				
<b>I want to nominate as under</b>				
Name of Nominee	Relationship	Age	Date of Birth in case of minor	Person authorised in case to receive the amount of deposit on behalf of the nominee in the event of my /minor(s) death.
<b>Place:</b>				
<b>Date:</b>			<b>Signature / LTI of Applicant</b>	
<b>Witness(es)*</b>				
1. _____				
2. _____				
*Witness is requires only for thumb impression and not for signature				

## UNIT 12.3.3: Costs: Fixed vs. Variables: What are Fixed and Variable Costs?

### Unit Objectives

At the end of this unit, participants will be able to:

- Differentiate between fixed and variable costs

### Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

### Ask

- What is cost?
- Will a telephone bill fall under the category of a fixed or variable cost?

### Say

- Discuss: Fixed and Variable cost with examples. Let us do a small activity.

### Team Activity

#### Identify the type of cost

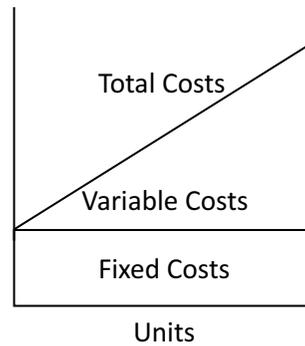
1. Rent
2. Telephone bill
3. Electricity bill
4. Machinery
5. Insurance
6. Office supplies/ Raw materials
7. Employee salaries
8. Commission percentage given to sales person for every unit sold
9. Credit card fees
10. Vendor bills

### Do

- Divide the class into two groups. Read out the list of costs given in the activity.
- Read out each item from the cost list and ask the groups in turns to identify whether it is a fixed or variable cost.

## Say

- We saw that your utility bills like rent, electricity, telephone etc. are all fixed costs because you have to pay it every month.
- Variable costs is an expense which varies with production output or volume. For example commission, raw material etc.
- Discuss “Cost: Fixed vs. variables” with the participants as given in the Participant Handbook.
- Illustrate the relation between the costs with a graph.



- Let's learn the difference between fixed and variable cost with the help of an activity.

## Team Activity

### Fixed vs. Variable Costs

- This is a group activity.
- You want to start your own entrepreneur business.
  - State the type of business you want to start.
  - List down all the cost or requirements for your business.
  - How will you differentiate between the fixed and variable cost.

### Activity De-brief

- What is the total cost of your business?
- What are the fixed costs?
- What are the variable costs?
- How did you differentiate between the fixed and variable costs?

## Do

- Instruct the participants that this is group work.
- Divide the class into small groups of 4 or 6.
- Give each group a sheet of paper.
- Tell the participants that they have to start their own entrepreneur business.
- Ask them the type of business they want to start.
- Instruct them to differentiate between the fixed and the variable costs of the business they want to start.
- Give the participants 15 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

## Summarize

- Note: You can summarize the unit either by having a role play between a consultant and a budding entrepreneur explaining the differences between fixed and variable costs or by discussing the key points of the unit.

## Notes for Facilitation

- Answers for the activity - Identify the type of cost

1. Rent	(Fixed)
2. Telephone bill	(Fixed)
3. Electricity bill	(Fixed)
4. Machinery	(Fixed)
5. Insurance	(Fixed)
6. Office supplies/ Raw materials	(Variable)
7. Employee salaries	(Fixed)
8. Commission percentage given to sales person for every unit sold	(Variable)
9. Credit card fees	(Variable)
10. Vendor bills	(Variable)

## UNIT 12.3.4: Investments, Insurance and Taxes

### Unit Objectives

At the end of this unit, participants will be able to:

- Describe the main types of investment options
- Describe the different types of insurance products
- Describe the different types of taxes

### Resources to be Used

- Participant Handbook

### Ask

- Ask the participants- “What do you see first thing in when you get your mobile bill? Apart from the amount and due date do you have a look at the taxes you are being billed for?”
- Why do you think people get their cars insured or have a medical insurance?
- You have saved money and want to invest it, how would you decide what is the best investment for your money?

### Example

- Let's have a look at a few scenarios.

Ranbir has sold his house and deposited the money in his bank. His Chartered Accountant tells him that he will have to re-invest the money otherwise he will have to pay capital tax. What is capital tax and how is it different from income tax?

Jasmeet and Anup are blessed with a baby girl. They decide to have an insurance policy that will mature when their daughter is ready to higher education.

Shivani is working in a corporate office and getting good pay. She will have to pay income tax so she decides to invest her money in tax saving schemes. She goes to the bank manager to discuss the best products in which she can invest.

### Say

- Discuss the Investment, Insurance and Taxes as given in the Participant Handbook.

### Ask

- How do investments, insurances and taxes differ from each other?

### Say

- Let's learn the differences between the three by having an activity.

### Say

- We will have a quiz today.

## Team Activity

- The activity is a quiz.

## Do

- Divide the class into groups of three and give a name to each group
- Explain the rules of the quiz. For each correct answer the group gets 1 mark. If the group is unable to answer the question is rolled over to the next group.
- Explain the purpose and duration of the activity.
- On the blackboard write the names of the groups.
- Ask the questions of the quiz.
- Keep a score for the groups.
- Set guidelines pertaining to discipline and expected tasks.

## Summarize

- Summarize the unit by discussing the key points and answering question

## Notes for Facilitation

### Questions for the quiz

1. What are bonds?  
*Bonds are instruments used by public and private companies to raise large sums of money.*
2. Who issues the bonds?  
*Private and public companies issue the bonds.*
3. Why are bonds issued?  
*To raise large amount of money as it cannot be borrowed from the bank.*
4. Who is the buyer of stocks and equities?  
*The general public is the buyer.*
5. What types of scheme is the Sukanya Samriddhi Scheme?  
*Small Saving Scheme*
6. What is the difference between mutual and hedge funds?  
*Mutual funds are professionally managed financial instruments that invest the money in different securities on behalf of investors. Hedge funds invest in both financial derivatives and/or publicly traded securities.*
7. Why is a loan taken from the bank to purchase real estate?  
*To lease or sell to make profit on appreciated property price.*
8. Name the two types of insurances?  
*Life Insurance and Non-life or general insurance*
9. Which insurance product offers financial protection for 15-20 years?  
*Term Insurance*
10. What is the benefit of taking an endowment policy?  
*It offers the dual benefit of investment and insurance.*
11. Mr. Das gets monthly return on one of his insurance policies. Name the policy?  
*Money Back Life Insurance*

12. What are the two benefits of a Whole Life Insurance?

*It offers the dual benefit of investment and insurance*

13. Which policy covers loss or damage of goods during transit?

*Marine Insurance*

14. After what duration is the income tax levied?

*One financial year*

15. What is long term capital gain tax?

*It is the tax payable for investments held for more than 36 months.*

16. Name the tax that is added while buying shares?

*Securities Transaction Tax*

17. What is the source of corporate tax?

*The revenue earned by a company.*

18. Name the tax whose amount is decided by the state?

*VAT or Value Added Tax*

19. You have bought a T.V. What tax will you pay?

*Sales Tax*

20. What is the difference between custom duty and OCTROI?

*Custom duty is the charges payable when importing or purchasing goods from another country. OCTROI is levied on goods that cross borders within India.*

## UNIT 12.3.5: Online Banking, NEFT, RTGS, etc.

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the uses of online banking
- Discuss the main types of electronic funds transfer

### Resources to be Used

- Participant Handbook
- Computer System with internet connection
- Debit card

### Ask

- When was the last time you visited a bank?
- How do you pay your bill for electricity and telephone?
- Have you ever tried to transfer money from one bank account to another bank account using the online banking facility?

### Say

- Most of us lead a busy life. Time has become more important than money. In this busy schedule no one has time to stand in bank queues. That's where Online Banking comes in. Online banking or internet banking means accessing your bank account and carrying out financial transactions through the internet.
- Discuss "What is online banking?" from the Participant Handbook.
- There are various advantages of online banking:
  - It saves time, as you need to visit the branch. .
  - You can conduct your banking transactions safely and securely without leaving the comfort of your home.
  - Online Banking also gives you round the clock access.
  - Online Banking makes it possible for you to pay your bills electronically.

### Do

- Show them how they can use the internet banking.
- Use the computer system and show the demo videos on how to use internet banking provided on most banking sites. the computer system.
- Tell the class the various features of online banking:
  - Through their website set-up your online account.
  - Choose a secure username and password.
  - Set-up your contact information.
  - Once your information is verified, you are good to go.
  - Once you enter the portal explore all the features and learn your way through the portal.
- Discuss about maintaining the security of the online account.

Say 

- One of the biggest advantage that online banking offers, as discussed earlier, is transferring money from one account to another. This transaction is called electronic funds transfer. Electronic transfers are processed immediately with the transferred amount being deducted from one account and credited to the other in real time, thus saving time and effort involved in physically transferring a sum of money.
- Discuss “Electronic Funds Transfer” from the Participant Handbook.

Do 

- Discuss how to transfer money from one account to another using online banking (NEFT/RTGS, etc.).
- Illustrate with an example.

Summarize 

- Close the discussion by summarizing the about online banking.
- Ask the participants if they have any questions related to what they have talked about so far.





## UNIT 12.4: Preparing for Employment & Self Employment

### Key Learning Outcomes

At the end of this unit, participants will be able to:

1. Discuss the steps to follow to prepare for an interview
2. Discuss the steps to create an effective Resume
3. Discuss the most frequently asked interview questions
4. Discuss how to answer the most frequently asked interview questions
5. Identify basic workplace terminology

## UNIT 12.4.1: Interview Preparation: How to Prepare for an Interview?

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the steps to follow to prepare for an interview

### Resources to be Used

- Participant Handbook

### Ask

- Have you ever attended an interview?
- How did you prepare before going for an interview?

### Say

- An interview is a conversation between two or more people (the interviewer(s) and interviewee) where questions are asked by the interviewer to obtain information from the interviewee.
- It provides the employer with an opportunity to gather sufficient information about a candidate and help them select the ideal candidate.
- It also provides the interviewee with an opportunity to present their true potential to the employer, build confidence and help make a decision about the job by asking questions regarding designation, salary, perks, benefits, promotions, transfers, etc.
- Let's do an activity to understand how to prepare for interviews better.

### Activity 1

- Introducing Yourself

### Do

- Select a participant and ask him/her to answer the following questions: "What can you tell me about yourself?"
- Give the participant at least one minute to speak.
- Once he/she is done, ask the rest of the participant what they gathered about the participant who was providing information.
- Now repeat the exercise with five other participants.

### Ask

- What information you should include when you are describing or introducing yourself in an interview?
- What information you should not include when you are describing or introducing yourself in an interview?

## Say

- Tell the participants that when an interviewer asks you to say something about yourself, he/she is not asking you to present your life history.
- Introduction should be short and crisp, and should present you in a positive light. It should include the following points:
  - Any work experience that you might have
  - A brief summary of your educational qualifications
  - Your strengths and achievements
  - Any special projects that you might have been part of
- The following topics should be avoided during an introduction:
  - Detailed description of your family (unless you are specifically asked to do so)
  - Too much information about your weaknesses
  - Information that is not true

## Do

- Congratulate each participant for sharing their points.
- Ask the audience to applaud for them.
- Ask de-brief questions to cull out the information from each group.
- Keep a check on time.

## Activity 2

- Planning the right attire

## Do

- Describe 2 individuals to the participants. One is wearing a casual t-shirt, jeans, and slippers. He has not combed his hair and neither has he trimmed or shaved his beard. The other individual is dressed formally with a shirt and pant, and is well-groomed. He has also worn formal shoes and a belt. Ask the participants which person would they prefer to hire in their organization and why?

## Summarize

- Close the discussion by discussing 'how to prepare for an interview' as discussed in the Participant Handbook.
- You can add the following points to it:
  - Tell the participants to create a positive and good impression in an interview. It is important for them to prepare for an interview beforehand.
  - The interviewer analyses not only your technical knowledge in relation to the job, but also whether or not you are a fit for the organization.
  - Every employer looks at the whole package and not just one or two things in isolation. Therefore, the way you dress and the way you present yourself is also important along with your skills and talents.
  - The participants will get only one chance to create a good first impression.

## UNIT 12.4.2: Preparing an Effective Resume: How to Create an Effective Resume?

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the steps to create an effective Resume

### Resources to be Used

- Participant Handbook
- Blank papers
- Pens

### Ask

- When preparing for an interview, what are the most important things that you need to do?
- What documents do you carry with you, when you go for an interview?
- What is a resume?
- Why do you need a resume?

### Say

- Resume is not just a sheet of paper with your qualifications printed on it.
- It is a selling tool that will help the employer to see how and what you can contribute for company.
- Talk about the steps involved in creating an effective/attractive resumes discussed in the Participant Handbook.
- Now let's prepare a resume to understand the process in a better way.

### Do

- This is an individual activity.
- Give the details of the activity.
- Instruct them to read the activity carefully.
- The participant is expected to make an attractive resume based on the information provided.
- Give the class 25-30 minutes to study the case and create a resume.
- At the end of 30 minutes, the participants should exchange the resume with the person sitting next to him or her.
- Every participant will evaluate the resume prepared with their fellow participants.

### Say

- Do you think the candidate should apply for the job posting described in the advertisement?
- We have already discussed the steps involved in creating an effective/attractive resumes.
- Now let's prepare a resume for the candidate details given in the activity.

## Activity

### Case Study Analysis

- In the first section of the activity, you are being given the information about a candidate who is applying for a particular job.
- In the second section, you are being given the detailed description of the job posting. Create a resume for the candidate to apply for the job posting.
- Use the information that has been provided about the candidate to create this resume.

### Candidate Details

Nipesh Singla was born on 20th April, 1988 in Chandigarh, India. He currently resides at 1XX7, Sector XX D, Chandigarh –160018. His mobile number is 988XXXXX01, and e-mail address is nxxxxxxxla@gmail.com. Nipesh attended middle and senior school at Government Boys Senior Secondary School, Sector 15, Chandigarh. He has been a very talented boy since school. He was fond of painting and watching old Hindi movies. As part of a school charity program, he volunteered at the children's hospital during his senior years.

In July 2007, he joined Westwood School of Hotel Management, Zirakpur to pursue a diploma course in Hotel Management and Catering. After completing this course, he joined XYZ Group of Hotels as a Housekeeping intern in June 2010 for six months. In this role, he was responsible for cleanliness and maintenance of one floor in the hotel. Taking advantage of his strong interpersonal skills, he also got opportunities to make housekeeping arrangements for corporate meetings. While pursuing education, he gained working knowledge of Microsoft Word, Excel, Access and PowerPoint.

Nipesh is detail-oriented, flexible and adaptable. He has successfully worked with a diverse work force. He gelled well with his peers, both in college and during his internship. After completing the internship, his objective has been to find a job opportunity where he can use his skills and experience. Backed by experience, he is confident about his skills as housekeeping assistant.

### Job Posting

\* Do you see yourself as a HOUSEKEEPING SUPERVISOR?

What's your passion? Whether you're into cricket, reading or hiking, at IHG we are interested in YOU. At IHG, we employ people who apply the same amount of care and passion to their jobs as they do in their hobbies - people who put our guests at the heart of everything they do. And we're looking for more people like this to join our friendly and professional team.

THE LOCATION:

At the moment, we are looking for HOUSEKEEPING SUPERVISOR to join our youthful and dynamic team at Holiday Inn Amritsar, Ranjit Avenue in Amritsar, Punjab (India). Holiday Inn Amritsar is ideally located in Amritsar's commercial district on Ranjit Avenue with the world famous Golden Temple located only a short distance away. Sparkling chandeliers mark an incomparable arrival experience as you escape to the welcoming environment that is, Holiday Inn Amritsar. The fresh international brand to celebrate and explore Amritsar.

*Salary:* Negotiable

*Industry:* Travel / Hotels / Restaurants / Airlines / Railways

*Functional Area:* Hotels, Restaurants

*Role Category:* Housekeeping

*Role:* Housekeeping Executive/Assistant.

Desired Candidate Profile

Friendly, pleasant personality, Service - oriented.

You should ideally be Graduate/ Diploma holder in HM and at least 2 years of experience as a supervisor in good brand with good communication skills, English is a must.

In return we'll give you a competitive financial and benefits package. Hotel discounts worldwide are available as well as access to wide variety of discount schemes and the chance to work with a great team of people. Most importantly, we'll give you the room to be yourself.

\*Please get in touch and tell us how you could bring your individual skills to IHG.

Education-

UG: Any Graduate/ Diploma holder

PG: Post Graduation Not Required

### Say

- Now, let's share the resume with the fellow participant sitting next to you and evaluate each other's effort.

### Do

- Congratulate each participant for making their first attempt towards creating an effective resume.
- As a follow up activity, you can suggest them to prepare their own resume and show it to you the next day.

### Summarize

- Close the discussion by showing some effective resume samples to the candidates.
- Ask the participants what they have learnt from this activity.
- Ask if they have any questions related to what they have talked about so far.

### Notes for Facilitation

- Keep printed copies of the activity ready for the session.
- Put down the suggested format of the resume on the board while explaining the steps in preparing a resume.
- Do check the participants' resume and suggest necessary changes.
- Suggested example for the case presented:

Nipesh Singla

#1XX7, Sector XX-D

Chandigarh-160018

Mobile No: 91-988XXXXX01

E-mail: nxxxxxxxxla@gmail.com

**Objective:** Seeking an opportunity to use my interpersonal skills and experience to contribute to your company's growth, profitability and objectives.

**Professional strengths:**

- Proficient in housekeeping
- Experienced in and capable of working with a diverse work force
- Team player and friendly in nature
- Successful working in a multi-cultural environment

- Detail oriented, flexible, and adaptable
- Knowledge of Microsoft Word, Excel, Access and PowerPoint

**Educational background:**

- Diploma in Hotel Management and Catering, Westwood School of Hotel Management, Zirakpur
- High School, Government Boys Senior Secondary School, Sector 15, Chandigarh

**Professional internships:**

- Housekeeping Intern, XYZ Group of Hotels, New Delhi (June 2010 – August 2010)
  - ♦ Responsible for cleanliness and maintenance of one floor in the hotel.
  - ♦ Got opportunities to make housekeeping arrangements for corporate meetings.

**Volunteer Work:**

- Student volunteer at children's hospital in Chandigarh.

Nipesh Singla

## UNIT 12.4.3: Interview FAQs

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the most frequently asked interview questions
- Discuss how to answer the most frequently asked interview questions

### Resources to be Used

- Participant Handbook

### Say

- Tell the participants you will provide them with interview situation and questions and they have to try to answer them.
- Tell them you will also explain the different ways to approach these questions.

### Do

- Divide the class in pairs and ask the participants to perform a role play.
- One partner will play the role of the interviewer while the other will play the role of the interviewee.
- Tell them the interviewer can start the interview by asking the interviewee to introduce himself/herself.
- Call all the pairs one by one in front of the class to enact the role play.
- Follow the same pattern for all other situations.
- Time allotted for each situation is 8-10 minutes.
- Congratulate each participant for giving their input.
- Ask the class to applaud each time a team has completed their role play.
- Keep a check on time.

### Role Play

Conduct a role play for the situation given.

#### Situation 1

- The interviewer will start by asking the interviewee a few generic questions such as:
  - What is your name?
  - Tell me something about yourself?
  - Can you tell me something about your family?
- Then, the interviewer will bluntly ask the following questions:
  - How do you explain this huge time gap in your resume?
  - What is the reason for this?
  - Weren't you looking for a job or is it that no one selected you?

## Say

### De-brief:

- When you put information on your resume, you should be prepared to answer any questions about it.
- Be present and focused on the questions being asked to you.
- One way of tackling the blunt questions is to tell the interviewer you did not come across an opportunity where you were sufficiently satisfied with both the remuneration offered as well as the profile. Therefore, you waited for the right opportunity to come along while looking for an ideal job.

## Role Play

Conduct a role play for the situation given.

### Role Play – Situation 2

- The interviewer will start by asking the interviewee a few generic questions such as:
  - ♦ What is your name?
  - ♦ Tell me something about yourself?
  - ♦ Can you tell me something about your family?
- Then, at the end of the interview, ask the interviewee:
  - ♦ There are over 200 people who have applied for this job, some with excellent work experience. Why should I hire you?

## Say

### De-brief:

- There is nothing wrong with stating your strengths and achievements. However, do not come across as arrogant or too boastful.
- You need show the interviewee that you have unique skills or talents to contribute to the company. The interviewer needs to know how you stand apart from the rest of the crowd.
- Tell the interviewer you are looking forward to working with the company and that you are a hard-working individual.

## Role Play

Conduct a role play for the situation given.

### Role Play – Situation 3

- The interviewer will start by asking the interviewee a few generic questions such as:
  - ♦ What is your name?
  - ♦ Tell me something about yourself?
  - ♦ Can you tell me something about your family?
- Then, lean forward, clasp your hands on the table and in a soft voice ask the interviewee:
  - ♦ Did you ever experience any neglect or disregard from your previous office? In other words, did you ever suffer because your office or team displayed favouritism?

## Say

### De-brief:

- Keep this in mind: Do not criticize anyone during an interview.
- You are free to express your opinion, however, your language, answers, body language, and the tone of your voice should remain constructive and neutral.
- Since criticism will show you in negative light, you should keep your answers honest yet diplomatic.
- You can tackle such questions by saying, “I got along well with most of my faculty and peers.”

## Role Play

Conduct a role play for the situation given.

### Role Play – Situation 4

- The interviewer will start by asking the interviewee a few generic questions such as:
  - ♦ What is your name?
  - ♦ Tell me something about yourself?
  - ♦ Can you tell me something about your family?
- Then very bluntly ask the interviewee:
  - ♦ How long do you plan to stay with this company if you are selected?
- After the candidate responds, ask sarcastically:
  - ♦ Do you seriously mean that?

## Say

### De-brief:

- Don't provide unreal and idealistic answers.
- Your answers should be honest yet diplomatic. In a situation like this, the interviewer does not expect you to provide a specific timeline.
- You can say something like, "I would like to stay with the company as long as I can contribute constructively and develop as an employee, within the organization, professionally and financially."

## Role Play

Conduct a role play for the situation given.

### Role Play – Situation 5

- The interviewer will start by asking the interviewee a few generic questions such as:
  - ♦ What is your name?
  - ♦ Tell me something about yourself?
  - ♦ Can you tell me something about your family?
- Ask him/her how important he/she thinks it is to be punctual in the corporate world.
- After he/she answers, look up sternly at the interviewee and in a crisp voice, say:
  - ♦ You were late for this interview by 10 minutes. That surely does not seem to be in line with what you just said?

## Say

### De-brief:

- Politely apologize for being late.
- You can add something such as, "I assure you this is not a habit". All your future actions should be in line with this statement.
- Avoid giving any excuses.
- You might feel obligated to provide a justification for your tardiness, but the interviewer is not interested in that.
- Do not over apologize. Once this response is out of the way, turn your focus back to the interview.

## Role Play

Conduct a role play for the situation given.

### Role Play – Situation 6

- The interviewer will start by asking the interviewee a few generic questions such as:
  - ♦ What is your name?
  - ♦ Tell me something about yourself?
  - ♦ Can you tell me something about your family?
- After asking a few academic or job-related questions, ask the interviewee:
  - ♦ If you get this job, what salary package do you expect us to give you?

## Say

### De-brief:

- If there is no way for you to avoid this question, respond to the interviewer by providing a reasonable and well-thought out salary range.

## Role Play

Conduct a role play for the situation given.

### Role Play – Situation 7

- The interviewer will start by asking the interviewee a few generic questions such as:
  - ♦ What is your name?
  - ♦ Tell me something about yourself?
  - ♦ Can you tell me something about your family?
- Then, bringing the interview to a close, ask the interviewee:
  - ♦ Do you have any questions for me?

## Say

### De-brief:

- Ask relevant questions.
- Don't bombard the interviewer with questions.
- If you have questions about the result of the interview, you can limit your questions to 1 or 2. Keep them short and relevant like:
  - ♦ When will I be informed about the results of the interview?
  - ♦ What are the working hours?
  - ♦ Will the job require me to travel?

## Explain

- Tell the participants to be prepared for answering different types of questions in an interview.
- Stay calm and focused, and take a moment to think about how you should respond. Always maintain a confident tone.
- Even if you don't intend to, your body language conveys your level of discomfort with a particular question. Try to keep your actions, tone, and gestures neutral.
- Maintain your composure while answering personal question.

**Do** 

- Tell all the participants to form pairs again.
- Tell them to use the following list of frequently asked interview questions to conduct mock interviews.
- They will use all or some of these questions to conduct mock interviews with their partners.
- One partner will play the role of the interviewer while the other will play the role of the interviewee.
- After they are through asking and answering the questions, the roles will be reversed.
- The same list of questions will be used again.
- After each mock interview ask the interviewer to provide feedback and clear any doubts that may arise.
- Time allotted for each situation is 30-35 minutes.

**Activity** **Mock Interview Questions**

Mock Interview Questions
Tell me something about your family.
What qualities would you look for in a Manager or a Supervisor?
Why did you apply for this job?
What do you know about this company?
How do you deal with criticism?
How do you plan to strike a good work-life balance?
Where do you see yourself five years from now?
Have you applied for jobs in other companies?
What kind of salary do you expect from this job?
Do you have any questions for me?

**Summarize** 

- Close the discussion by discussing the questions in the both activities.
- Ask the participants what they have learned from this activity.
- Ask if they have any questions related to what they have talked about so far.

## UNIT 12.4.4: Work Readiness – Terms and Terminology

### Unit Objectives

At the end of this unit, participants will be able to:

- Identify basic workplace terminology

### Resources to be Used

- Participant Handbook
- Chart papers
- Blank sheets of paper
- Pens

### Ask

- What do you understand by workplace terminology?
- Are offer letter and contract of employment the same?

### Say

- Let's start this unit with an activity.

### Team Activity

#### Workplace terminology

- This is a group activity conducted in three parts.

#### Part 1

Sheila received a call from the recruiter of MND Company. Before she is recruited by the company, think of the recruitment process she will have to go through. Start from the telephone call to signing her letter of acceptance. Write down all the words that come to your mind.

#### Activity De-brief

- Have the participants read out the words they have written
- Encourage all the participants to participate in the activity

### Do

- Divide the class into small groups of 4 or 6.
- Instruct the participants that they will be doing a brainstorming activity.
- Give them one chart paper each. Tell them to divide the chart in two parts.
- Instruct them that they have to use one half of the chart paper now. The other half will be used later.
- The participants have to write all the words that come to their mind related to the recruitment process.
- Give them 10 minutes to do the activity.
- Tell them that there are no right or wrong answers.
- Keep a track of the time.

**Say** 

- You all know quite a few words related to the terms used in the office.
- Let us talk about some new terms that have been missed out.
- Discuss “Work Readiness – Terms and Terminology” with the participants as given in the Participant Handbook.

**Ask** 

- Why is it important to know the workplace terms?
- How do they help?
- Can the words be categorised further?

**Say** 

- Let's now continue the activity.

**Team Activity** **Terms and Terminology**

- This is again a group activity. The members of the group remain the same as in Activity 1.

**Part 2**

With the help of the new terms you have learned, make a flow chart of the hiring process of MND Company.

**Activity De-brief**

- Ask the groups to share the flow charts and the new terms they added while preparing the flow chart.

**Do** 

- Instruct the participants that they have to use the 2nd half of the same chart they had used before.
- Using the new terminology and the terms they had previously written on the chart, they have to make a flow chart of the hiring process of the MND Company.
- Give them 10 minutes for this activity.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

**Say** 

- Let's go ahead with the activity.

**Team Activity** **Terms and Terminology**

- The activity continues with the same group members.

**Part 3**

Sheila now works for the MND Company. She is not aware of the company culture and policies. She goes to the HR Department to get her doubts clarified. Can you think of the terms for which she wants clarity? Make a list of those words.

**Activity De-brief**

- Ask the groups to share their list of words. Some of the words are benefits, comp. time, deduction, employee training, holidays, lay-off, leave, maternity leave, mentor, notice, paternity leave, and time sheet.

**Do** 

- Instruct the participants to identify the key terms an employee of a company should know. They can use the same chart paper for this activity.
- Give them 5 minutes for this activity.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

**Summarize** 

- Note: You can either summarize the key points of the unit or have a role play where an employee has just joined a company and the HR Manager explains the terms of employment.



## UNIT 12.5: Understanding Entrepreneurship

### Key Learning Outcomes



At the end of this unit, participants will be able to:

1. Discuss the concept of entrepreneurship
2. Discuss the importance of entrepreneurship
3. Describe the characteristics of an entrepreneur
4. Describe the different types of enterprises
5. List the qualities of an effective leader
6. Discuss the benefits of effective leadership
7. List the traits of an effective team
8. Discuss the importance of listening effectively
9. Discuss how to listen effectively
10. Discuss the importance of speaking effectively
11. Discuss how to speak effectively
12. Discuss how to solve problems
13. List important problem solving traits
14. Discuss ways to assess problem solving skills
15. Discuss the importance of negotiation
16. Discuss how to negotiate
17. Discuss how to identify new business opportunities
18. Discuss how to identify business opportunities within your business
19. Explain the meaning of entrepreneur
20. Describe the different types of entrepreneurs
21. List the characteristics of entrepreneurs
22. Recall entrepreneur success stories
23. Discuss the entrepreneurial process
24. Describe the entrepreneurship ecosystem
25. Discuss the purpose of the Make in India campaign
26. Discuss key schemes to promote entrepreneurs
27. Discuss the relationship between entrepreneurship and risk appetite
28. Discuss the relationship between entrepreneurship and resilience
29. Describe the characteristics of a resilient entrepreneur
30. Discuss how to deal with failure

## UNIT 12.5.1: Concept Introduction (Characteristic of an Entrepreneur, types of firms/ types of enterprises)

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the concept of entrepreneurship
- Discuss the importance of entrepreneurship
- Discuss the characteristics of an entrepreneur
- Describe the different types of enterprises

### Resources to be Used

- Participant Handbook

### Say

- Let's start this session with some interesting questions about Indian entrepreneurs.

### Team Activity

#### Quiz Questions

1. Who is the founder of Reliance Industries?  
Dhirubhai Ambani
2. Who is the Chairman of Wipro Limited?  
Azim Premji
3. Who launched e-commerce website Flipkart?  
Sachin Bansal and Binny Bansal
4. Who is the founder of Paytm?  
Vijay Shekhar Sharma
5. Who is CEO of OLA Cabs?  
Bhavish Aggarwal
6. Who is the founder of Jugnoo?  
Samar Singla (autorickshaw aggregator)
7. Who is the founder of OYO Rooms?  
Bhavish Aggarwal

### Do

- Tell them that you will ask them few questions about a few entrepreneurs.
- Divide the class in to two groups.
- In turns ask the quiz questions to the groups.
- If the answer is incorrect pass the question to the other group.
- Share the answer if the groups are not able to answer.
- Congratulate the participants who answered correctly.

### Ask

- What do you understand by entrepreneurs?
- What is the importance of entrepreneurship in today's scenario?
- What do you think are the characteristics of successful entrepreneurs?
- What are different types of enterprises that an entrepreneur in India can own and run?

### Say

- Talk about entrepreneurs, importance of entrepreneurship, characteristics of successful entrepreneurs, and different types of enterprises in India as discussed in the Participant Handbook.
- Tell the participants, stories of successful Indian entrepreneurs- their struggles, the moments of heartbreak, the perseverance and triumph.
- Ask them if they know of any such entrepreneur.

### Summarize

- Close the discussion by summarizing about the opportunities for entrepreneurs in India.

### Notes for Facilitation

- Check out different Government schemes for small entrepreneurs. Share the information with the participants.
- You can tell them about the government websites like Start Up India, mudra.org.in etc.
- Discuss about various schemes and policies by the Government of India for entrepreneurs.

## UNIT 12.5.2: Leadership and Teamwork

### Unit Objectives

At the end of this unit, participants will be able to:

- List the qualities of an effective leader
- Discuss the benefits of effective leadership
- List the traits of an effective team

### Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

### Do

- Show the picture given below to the class.
- Ask them to quickly write on a piece of paper what comes to their mind after seeing the picture.
- Now ask them, “What do you understand from this picture?”
- Encourage participants to share their thoughts.



### Say

- This picture depicts the qualities of a leader and the difference between a leader and a boss.
- A boss focuses on structure and inspires fear whereas a leader follows vision and generates enthusiasm.
- A boss blames employees for the breakdown whereas a leader fixes breakdowns.
- A boss depends on authority whereas a leader depends on goodwill.
- A boss says “I” and a leader says “We.”
- A boss drives employees whereas a leader coaches them.
- A boss takes credit whereas a leader gives credit.

### Say

- Talk about leadership and leadership qualities for an entrepreneur as discussed in the Participant Handbook.

### Ask

- Why is it important for a leader to be effective? How does it help the organization?

**Say** 

- Let us discuss benefits of effective leadership as discussed in the Participant Handbook.
- “Out-of-the-box thinking” is one of the new leadership styles. It means thinking differently and from a new perspective.

**Ask** 

- Do you consider yourself a team player?

**Team Activity** **Long Chain**

- This is a group activity.

**Do** 

- Divide the class into 2 teams.
- Ask each team to create a chain using materials they have in class such as shoe laces, belts, paper, handkerchief, ribbons, etc.
- The team that creates the longest chain wins the game.
- Observe if the participants are interacting with their team or working in isolation.
- Share your observations with the class.

**Say** **De-brief:**

- What did the winning team do differently?
- Who was responsible for the winning team's success?
- How does this activity explain the role of teamwork in entrepreneurial success?

**Say** 

- Tell the class that both the teams performed well.
- Discuss that the objective of this activity was to open communication channels and how this has been achieved.
- The participants should aim to keep the communication channels open when interacting with their peers and team members.
- It will set the pace and enthusiasm required for all the ensuing teamwork activities.
- Talk about teamwork and importance of teamwork in entrepreneurial success as discussed in the Participant Handbook.

**Summarize** 

- Close the discussion by summarizing about the importance of teamwork for employees.
  - Teamwork helps in reducing stress for the employees.
  - Teamwork helps employers in generating more number of solutions to a problem and developing improved communication amongst employees.
- Ask the participants what they have learned from these exercises.
- Ask if they have any questions related to what they have talked about so far.

## UNIT 12.5.3: Communication Skills: Listening & Speaking: The Importance of Listening Effectively

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the importance of listening effectively
- Discuss how to listen effectively
- Discuss the importance of speaking effectively
- Discuss how to speak effectively

### Resources to be Used

- Participant Handbook

### Activity 1

#### Activity – Chinese Whisper

Step 1: Form a circle.

Step 2: Start a whisper chain. Any one participant will whisper a message into his/her neighbour's ear. No one else must hear the message. The message can be serious or downright silly.

Step 3: The next person who first heard the message should whisper the message very quickly to the person sitting next to them.

Step 4: The game goes on until the last person says whatever they heard out loud and the first person reveals the real message.

Compare them and have a great laugh!

### Ask

#### De-brief questions:

- Was the original message the same as the message that is communicated at the end of the game?
- Why do you think there was a difference in the messages?

### Say

- No, the original message was not same at the end of game.
- The barriers to communication like language, disturbance and noise, poor listening skills, boredom, poor speaking skills, etc. are the potential reasons this happens.
- There are various aspects to communication. Speaking skills and listening skills are two major components to any communication. There is always some room for improvement in the way we communicate.
- It is important to accept the reality of miscommunication and work to minimise its negative impacts.

## Say

- Communication is a two-way process where people exchange information or express their thoughts and feelings
- It involves effective speaking and effective listening.
- If I go to the store to get bread, I exchange money for the bread. I give something and get something in return. Communication takes place in the same manner. You have to provide and receive information for communication to take place.

## Ask

- How often do you hear these statements?
  - “You're not listening to me!”
  - “Why don't you let me finish what I'm saying?”
  - “You just don't understand!”
- What do you think the other person is trying to convey to you through these sentences?
- We will not talk about the importance of listening effectively as discussed in the Participant Handbook.

## Say

- Let's play a game to understand effective listening process better.

## Do

- This is a class activity.
- The participants need to answer the questions they hear.
- Instruct them to listen carefully.
- You will read it at a stretch and if need be repeat it once more.
- Tell the participants to raise their hand if they know the answer to the question asked.
- Keep a check on time.

## Activity 2

### Riddles:

Is there any law against a man marrying his widow's sister?

If you went to bed at eight o'clock at night and set the clock's alarm to ring at nine o'clock, how many hours of sleep would you get?

Do they have a 26th of January in England?

If you had only one match and entered a dark room that had a kerosene lamp, oil heater, and a wood stove, what would you light first?

The Delhi Daredevils and the Chennai Super Kings play five IPL matches. Each wins three matches. No match was a tie or dispute. How is this possible?

There was an airplane crash. Every single person died, but two people survived. How is this possible?

If an airplane crashes on the border of two countries, would unidentified survivors be buried in the country they were travelling to or the country they were travelling from?

A man builds an ordinary house with four sides except that each side has a southern exposure. A bear comes to the door and rings the doorbell. What is the colour of the bear?

**Answers:**

There's no law against a man marrying his widow's sister, but it would be the neatest trick in the book since to have a widow, the man would have to be dead.

You'd get one hour's sleep since alarm clocks do not know the difference between morning and night.

Oh, yes. They have a 26th of January in England. They also have a 27th, a 28th, and so on.

First of all, you would light the match.

Who said the Delhi Daredevils and the Chennai Super Kings were playing against each other in those games?

Every SINGLE person died, but those two were married.

You can't bury survivors under any law especially if they still have enough strength to object.

The bear that rang the doorbell would have to be a white bear. The only place you could build a house with four southern exposures is at the North Pole where every direction is in South.

**Ask** **De-brief question:**

- What were the barriers that came into your way of listening?
- How can you overcome barriers to listening?

**Say** 

- There is a difference between hearing and listening.
- If you don't listen properly, the message may be misunderstood.
- Be open-minded while listening to someone.
- It is important to listen effectively and carefully without making assumptions.

**Activity 3** **Elevator Pitch:**

You are in the lift of a hotel and you bumped into your former client who is a famous businessman. He has financed a lot of small business ventures and can finance your new start-up too. After exchanging pleasantries, he asks you what your new company does. You open your mouth, and then pause. Where do you even begin?

Then, as you try to organize your thoughts, his meeting is called, and he is on his way. If you would have been better prepared, you're sure that he would have stayed long enough to schedule a meeting with you too.

If you were given another chance, what would you have said to this person?

**Do** 

- Start off the task by providing a beginning sentence to get the story started, and then go around the classroom getting each one to add a new sentence to keep the story going.
- This task should be done spontaneously allowing only a little time to think (30 seconds).
- For example: **There was once a student who was looking for a job after graduation.**

## Notes for Facilitation

- Tell the participants to follow these steps to create a great pitch, but bear in mind that you'll need to vary your approach depending on what your pitch is about.
  1. **Identify Your Goal:** Start by thinking about the objective of your pitch. For instance, do you want to tell the potential clients about your organization? Do you have a great new product idea that you want to pitch to an executive or do you want a simple and engaging speech to explain what you do for a living?
  2. **Explain What You Do:** Start your pitch by describing what your organization does. Focus on the problems that you solve and how you help people. Ask yourself this question as you start writing: what do you want your audience to remember most about you? Keep in mind that your pitch should excite you first. After all, if you don't get excited about what you're saying neither will your audience. People may not remember everything that you say, but they will likely remember your enthusiasm.
  3. **Communicate Your USP:** Your elevator pitch also needs to communicate your unique selling proposition or USP. Identify what makes you, your organization or your idea unique. You'll want to communicate your USP after you've talked about what you do.
  4. **Engage with a Question:** After you communicate your USP, you need to engage your audience. To do this, prepare open-ended questions (questions that can't be answered with a "yes" or "no" answer) to involve them in the conversation. Make sure that you're able to answer any questions that he or she may have.
  5. **Put it all Together:** When you've completed each section of your pitch, put it all together. Then, read it aloud and use a stopwatch to time how long it takes. It should be no longer than 20-30 seconds. Remember, the shorter it is, the better!

### Example:

Here's how your pitch could come together:

"My company deals with cloth retail online business and we use various e-commerce platforms to sell our products. This means that you can do shopping with ease and spend time on other important tasks. Unlike other similar companies, we have a strong feedback mechanism to find out exactly what people need. This means that, on average, 95 percent of our clients are happy with our products. So, how can you help us in creating our own web portal?"

6. **Practice:** Like anything else, practice makes perfect. Remember, how you say it is just as important as what you say. If you don't practice, it's likely that you'll talk too fast, sound unnatural or forget important elements of your pitch. Set a goal to practice your pitch regularly. The more you practice, the more natural your pitch will become. Practice in front of a mirror or in front of colleagues until the pitch feels natural.

## Summarize

- Close the discussion by summarizing how to speak effectively as discussed in the Participant Handbook.

## UNIT 12.5.4: Problem Solving & Negotiation Skills

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how to solve problems
- List the important problem solving traits
- Discuss ways to assess problem solving skills
- Discuss the importance of negotiation
- Discuss how to negotiate

### Resources to be Used

- Participant Handbook

### Ask

- What is a 'problem'?
- What do you think are the problems you may face in the process of becoming a successful entrepreneur?

### Say

- Discuss the definition of problem as given in the Participant Handbook.
- In a hurdle race the hurdles are the obstacles on the way to reach your goal.
- Similarly, obstacles are the hurdles you may face while reaching your goal i.e. to set-up your own business. Your goal will be to reach the finishing line after crossing these hurdles.

### Ask

- What do you do when you face a problem?
- How do you resolve it? You can pick examples from the question asked previously 'the problems they are likely to face in the process of becoming a successful entrepreneur'.

### Say

- Discuss how to solve problems as given in the Participant Handbook.

### Team Activity

- This is a group activity.
  - The groups will solve the problem and come up with the best solution in each case.
1. Unable to arrange for some extra finance for setting up a beauty parlour. The loan sanctioned and disbursed is not enough. You have tried all your contacts, friends and relatives. But unable to manage the extra amount. Bank will not sanction more amount as you have used up the complete sanction limit.
  2. You have rented a space for your business and all arrangements are done. You will be operating from the office space rented in two days. Now the owner comes up to you and says he wants to sell the place and wants you to vacate in 15 days.
  3. You have just set up your business and need extra human resource. You have tried inviting a few also tied up with an agency for getting the right candidate. But you are unable to get the right candidate. If the candidate is good, you cannot offer the salary demanded. If the candidate agrees to the salary, he/she has other demands like working hours to be reduced, leaves etc. which may not work for your set up.

**Do** 

- Divide the class into three groups. Give one scenario to each group.
- Explain the purpose and duration of the activity.
- Ask the groups to build on the scenario and present their solution as a role play.

**Say** **De-brief questions:**

1. What was the problem?
2. Is there any other alternative solution?
3. Is this the best solution presented?

**Ask** 

- Try to think of some people around you who are able to solve problems very easily. Even you or your friends might be approaching them when there is a problem. What qualities do they have? What personality traits do such people possess?

**Say** 

- Discuss the important traits for problem-solving as given in the Participant Handbook.

**Ask** 

- In order to build a successful organization, you need to hire people who possess good problem solving skills. How would you assess the level of problem solving skills of potential candidates before hiring them?

**Say** 

- Discuss how to assess for problem-solving skills as given in the Participant Handbook.

**Summarize** 

- Ask the participants the things that they have learnt so far.
- Ask if they have any questions related to what they have talked about so far.
- Summarize the discussion on problem solving.

**Activity** 

- The activity is to organise an election event. Select three volunteers from the group. They have to give a speech on their election manifesto to the class. They have to negotiate with the fellow participants and convince them to vote for them. The best negotiator will win the election.

**Do** 

- Ask three participants to volunteer for the activity.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

**Ask** 

- Out of the three contestants, whom would you support? Why? What did they say or do which convinced you to make your decision?
- Have you ever tried to negotiate in your personal or professional life?
- Ask the class to share some of their experiences where they have been able to strike a deal by negotiating.

**Say** 

- Discuss “What is Negotiation?” as given in the Participant Handbook.

**Ask** 

- Why is it important to negotiate? As an entrepreneur, where do you think that negotiation skills will be needed?

**Say** 

- Discuss the importance of negotiation while starting a business as given in the Participant Handbook.

**Say** 

- Discuss the important steps to negotiate as given in the Participant Handbook.

**Role Play** 

- Conduct a role play activity.
- Ask the participants to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

**Do** 

- Divide them into groups of four (4) (depending on the batch size).
- Give them the hand-outs for role play scenarios.
- Two groups to be given scenarios on problem solving.
- Other two groups to be given scenarios on negotiation.
- The groups will build on the scenarios and prepare for the role play.
- Give the groups at least 5 mins to discuss and be ready with the role play.
- Invite each group one by one to come and present their role play.

**Problem solving Scenario 1**

Avinash has a Mobile Repair Store in Allahabad. His outlet is one of the most popular one in the vicinity and he has great rapport with his customers. He is always well-dressed, jovial and full of energy.

It's around 11 AM, when a customer barges in to the shop and starts shouting at Avinash for giving her back the instrument which is still not working. The screen of her mobile is also cracked from one side. Avinash remembered thoroughly checking the handset before handing it over to the customer. The customer threatens to sue the company and to go to Consumer Court for cheating her.

**Problem solving Scenario 2**

You are running a successful small scale business, Shreeji Aggarbattis,. Your staff members do door to door selling and organise marketing campaigns in local markets. Your brand has established it's name in last few years.

Recently, lot of customers have been coming to you and lodging complaints that your staff members indulge in malpractices. Few of them informed you that a staff member engaged them in a friendly conversation. In the meanwhile, the other gave them lesser packets of aggarbattis than they paid for.

Another set of customers lodged complaint about the misconduct and rude behaviour of a particular staff member.

You often hear from your customers that the orders don't get delivered on time or wrong products get delivered.

You have already been struggling with shortage of staff and such complaints are a serious concern as it is hampering your brand image. What strategies will you adopt to solve this problem?

**Negotiation Scenario 1**

You have interviewed a prospective new employee who could be a key member of your new entrepreneurial venture. The new person is demanding a salary that is 20% higher than you thought based on your business plan. Finances are tight, yet you believe this person could make a significant impact on future profits. If you paid the required salary for the new person, then you would have to restructure your entire business plan. You've been searching for an individual with this skill level for three months. to the candidate is waiting for your response. Now you have to call him in to make the final negotiations.

**Negotiation Scenario 2**

You are a young entrepreneur who has just registered his start up project and applied for a bank loan accordingly. You receive a letter saying that your loan application has been rejected as your start up idea did not appeal to the bank and they think that it is not a revenue generating model. You have taken an appointment to meet the manager and show your negotiation skills to get your loan approved.

**Notes for Facilitation** **Facilitating Role Plays****Preparing for the activity**

1. Carefully review the details of the scenario and the character descriptions.
2. Become familiar with the key issues being addressed in the scenario.
3. Study the provided material so that you are ready to address issues related to the situations depicted in the role-plays.
4. Anticipate and know how to address issues participants might raise during the activity.

**Conducting the activity**

1. Introduce the activity. Emphasize that role-playing provides participants with an opportunity to apply their new knowledge, skills, and tools in situations that simulate actual interactions with customers.
2. Ask participants to form pairs. Direct the members of each group to choose who will play the roles. Remind the groups that each participant should be given the opportunity to play/practice the different roles.
3. Conduct a demonstration so that participants become familiar with the expectations related to the roles and support materials.
4. Give the pairs/ groups 10 to 15 minutes to conduct the role-play (depending on the duration of the session).
5. After all the groups have finished with the role-play, conduct a debriefing session on each role-play.
6. Ask the groups to take five minutes to talk about what happened during the role-play. The groups should discuss the questions given in the debriefing for each role-play. Encourage participants to provide constructive criticism during their discussions.

**Summarize** 

- Wrap the unit up after summarizing the key points and answering questions.

## UNIT 12.5.5: Business Opportunity Identification: Entrepreneurs and Opportunities

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how to identify new business opportunities
- Discuss how to identify business opportunities within their business

### Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

### Ask

- How does an entrepreneur identify an opportunity?
- What do you think are the common queries or concerns faced by entrepreneurs?
- How can you identify new business opportunity?

### Say

- Let's talk about opportunity, common queries or concerns faced by entrepreneurs, idea as an opportunity, factors to consider when looking for opportunities, ways to identify new business, and opportunity analysis as discussed in Participant Handbook.
- Let's do an activity to understand ways to identify business opportunities within your business.

### Do

- Tell the class that this is an individual activity.
- Tell the participants to create a matrix on their notebooks.
- There will be four boxes in your matrix.
- Strength, Weakness, Opportunity and Threats will be the four headings of the matrix. This is called the SWOT matrix.
- Read out the questions to them and tell the participants they need to answer the questions asked in each matrix.
- Tell them they can also use their own understanding of themselves to fill the SWOT matrix.

### Activity

#### Do your SWOT analysis

#### Strength

What are your strengths?  
 What unique capabilities do you possess?  
 What do you do better than others?  
 What do others perceive as your strengths?

#### Weakness

What are your weaknesses?  
 What do your competitors do better than you?

#### Opportunity

What trends may positively impact you?  
 What opportunities are available to you?

#### Threat

Do you have solid financial support?  
 What trends may negatively impact you?

**Do** 

- Congratulate everyone for the class activity.
- Ask the audience to applaud for themselves.
- Allot the participants sufficient time to complete this activity, but do keep a check on time.
- Ask de-brief questions to cull out information from the participants.

**Ask** **De-brief questions:**

- What are your weaknesses according to your SWOT analysis?
- Do you think you can change your weakness into strength? How?
- Do you think you can work on your threats? How?

**Summarize** 

- Close the discussion by summarizing ways to identify business opportunities within your business.
- Ask the participants what they have learned from this exercise.
- Ask if they have any questions related to what they have talked about so far.

## UNIT 12.5.6: Entrepreneurship Support Eco-System

### Unit Objectives

At the end of this unit, participants will be able to:

- Explain the meaning of entrepreneur
- Describe the different types of entrepreneurs
- List the characteristics of entrepreneurs
- Recall entrepreneur success stories
- Discuss the entrepreneurial process
- Describe the entrepreneurship ecosystem
- Discuss the purpose of the 'Make in India' campaign
- Discuss the key schemes to promote entrepreneurs

### Resources to be Used

- Participant Handbook
- Chart papers
- Marker pens
- Pencils
- Colour pencils
- Scale
- Eraser
- Other requisite stationery material

### Ask

- Do you think that entrepreneurs need support?
- What do you think is an eco-system?
- What do you think 'entrepreneurship support eco-system' means?

### Say

- Let's learn what entrepreneurship support eco-system means.
- Discuss 'Entrepreneurship Support Eco-System' as given in the Participant Handbook.

### Ask

- Can you define entrepreneurship support eco-system?
- What are the key domains of the support eco-system?

### Say

- Let's learn more about these domains by conducting an activity.
- You have to make a poster showing the components of the six main domains of entrepreneurship support eco-system.

### Team Activity

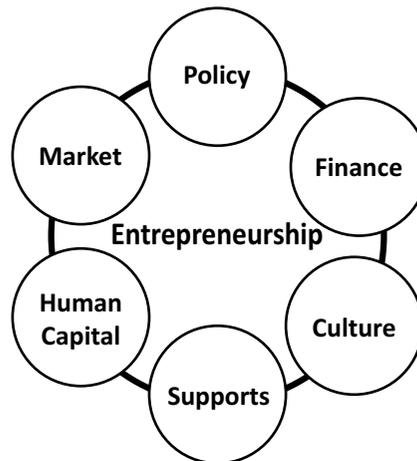
- Making a poster showing the entrepreneurship support eco-system.

**Do** 

- Divide the class into groups of four or six.
- Hand out chart paper and coloured pens.
- Explain the purpose and duration of the activity.
- Go around checking the progress of each group.
- Set guidelines pertaining to discipline and expected tasks.

**Activity De-brief**

Ask each group to display their poster and explain the key domains of entrepreneurship support eco-system.

**Ask** 

- What kind of government support eco-system is available for entrepreneurs in India?

**Say** 

- Discuss 'Make in India' campaign as given in the Participant Handbook.

**Team Activity** 

- Presentation on key schemes to promote entrepreneurs

**Do** 

- Divide the class into pairs.
- Number each pair from 1-15.
- Assign a scheme, same as their group number, to each group.
- Ask them to read the scheme carefully and present it to the class.
- Explain the purpose and duration of the activity.
- Go around checking the progress of each group.
- Set guidelines pertaining to discipline and expected tasks.

**Activity De-brief**

- Ask each group to explain the scheme offered by government to promote entrepreneurs.

**Summarize** 

- Summarize the unit by discussing the key points and answering questions the participants may have.

## UNIT 12.5.7: Risk Appetite & Resilience

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the relationship between entrepreneurship and risk appetite
- Discuss the relationship between entrepreneurship and resilience
- Describe the characteristics of a resilient entrepreneur

### Resources to be Used

- Participant Handbook
- Chart papers
- Blank sheets of paper
- Pens
- Marker pens

### Ask

- Can you define risk or explain what constitutes a risk?
- What do you people mean when they say, “This may be a risky proposition”?
- What risks are they talking about?

### Example

- Let's have a look at these two examples:

Rohit and his family were travelling by car from Delhi to Nainital. It was their second trip there. Rohit was familiar with the road. His friends told him that the highway after Rampur was in a bad condition. They advised him to take a shortcut and turn left from Moradabad and take the Kaladhungi road. This road is in a better condition.

Since he was going with his family, and did not want to take the risk of getting lost, he left early. He took the Kaladhungi road and reached Nainital well in time.

Suresh and his family too were travelling by car from Delhi to Nainital. It was their second trip there. His friends too advised him to take a shortcut and turn left from Moradabad and take the Kaladhungi road as this road was in a better condition.

Suresh too decided to take the Kaladhungi road but he left Delhi in the afternoon. It was dark by the time he reached Kaladhungi, and he was sure that he was taking the correct turn. As it was late, he could not find anyone to give him directions. He ended up being in an unknown place that was scarcely inhabited.

### Say

- Let's see what type of risks Rohit and Suresh took.
- Discuss 'Risk Appetite and Resilience' with the participants as given in the Participant Handbook.

### Say

- Let's learn more about risk appetite and resilience with the help of an activity.

## Team Activity

### Risk Appetite

- This is a group activity.
- In the previous unit, you read success stories of Mr Dhirubhai Ambani and Dr Karsanbhai Patel.
  - Mr Ambani left his job and started his company Reliance with just Rs. 50,000/-.
  - Dr Patel kept his job, went door-to-door to sell Nirma, and only when the brand started gaining popularity did he start his own company.
  - What types of risk did both of them take?
  - What risk factors, do you think, did they keep in mind before launching their company?
  - Write the Risk Appetite Statement of both the companies.

### Activity De-brief

- Who took a greater risk?
- What are the differences between the Risk Appetite Statement of both the companies?

## Do

- Instruct the participants that this is group work.
- Divide the class into small groups of 4.
- Give each group a chart paper.
- Tell the participants that they have to evaluate the risks taken by Mr Dhirubhai Ambani and Dr Karsanbhai Patel.
- Give the participants 15 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

## Ask

- Do you think all entrepreneurial ventures are successful?
- What happens if the first venture is not successful?
- Should the entrepreneur stop when faced with challenges or face them?

## Example

- Let's have a look at the following example:

Vijay Shekhar Sharma is the founder of Paytm, which is a giant Indian e-commerce. He was born in a middle-class family in Uttar Pradesh. He started his first job at an MNC. He quit after six months and built a company One97 with his friends. As One97 grew bigger, it needed more money because it was running more servers, bigger teams, and had to pay royalty. At that time, the tech bubble popped and technology companies were running in losses. Finally, money ran out. So One97 took loans and then more loans at higher rates of interest, as high as 24 per cent, and became caught in a vicious cycle.

In 2014, Paytm was launched with online wallet services after which, the company enabled online payment transactions. The company got licenses from RBI in 2016 to launch India's first ever payment bank. Moreover, the main motive of Paytm was to transform India into a cashless economy.

After demonetization came into effect, Vijay Shekhar Sharma started promoting online and digital transactions to deal with the cash crunch. In fact, the service of the company's mobile wallet is accepted across India. The logo of Paytm is now popular almost everywhere from tea stalls to major companies.

**Say** 

- Let's see what qualities made Vijay Shekhar Sharma a resilient entrepreneur.
- Discuss Entrepreneurship and Resilience with the participants as given in the Participant Handbook.

**Say** 

- Let's learn more about entrepreneurship and resilience with the help of an activity.

**Team Activity** **Entrepreneurship and Resilience**

- This is a group activity.
- Think of some entrepreneurship ventures that faced challenging times, but later resulted in success stories.
  - Who is the founder of that company?
  - What challenging times did it face?
  - How did it overcome those challenges?
  - List the resilient characteristics of the entrepreneur.

**Activity De-brief**

- Each group to give their presentation.
- Why did you choose this company?
- What is the success story of the company?

**Do** 

- Instruct the participants that this is group work.
- Divide the class into small groups of 4.
- Give each group a chart paper.
- Tell the participants that they have to think of an entrepreneur who faced challenging times, but eventually succeeded.
- Give the participants 15 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

**Summarize** 

- You can summarize the key points of the unit.
- Ask the participants what they learned from the activities.
- Clarify any questions or doubts they might have.

## UNIT 12.5.8: Success and Failures

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how to deal with failure

### Resources to be Used

- Participant Handbook

### Ask

- Have you heard the quote 'nothing is impossible'?
- What do you think it means?
- Do you think that all successful entrepreneurs became famous overnight or did they have to struggle or face failure before succeeding?

### Example

- Let's have a look at this example.

Shah Rukh Khan, also known as, SRK or King Khan is a force to reckon with. Did he achieve stardom overnight? Shah Rukh Khan, who has seen many struggles in his life – he has slept on streets, struggled to support himself and his sister at a very young age, and lost his parents very early in life, which led to his sister seeking mental health support. Amidst all the chaos and challenges, he kept pushing himself, and today he stands tall as the 'Badshah of Bollywood'. Certainly those years were not easy for him.

When he was young, he stood at Marine Drive and said, "I will rule this city one day". Failure was not just his companion during or before his stardom, it is still a substantial part of his life. Success does not come easy. What made him a star was his acceptance of failure and the urge to improve.

### Say

- How do you define success and failure?
- What is fear?
- Discuss "success and failure" with the participants as given in the Participant Handbook.

### Ask

- Have you felt or experienced fear?
- What led you to feel that emotion?
- How did you handle it?

### Say

- Let's learn the about success and failure with the help of an activity.

## Team Activity

- Divide the class into groups of four.
- Instruct them to think of one scenario where they have to interview a successful entrepreneur.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- They have to choose one person from the group as the interviewee and one as the interviewer.
- Go around and make sure they have understood what is to be done and are discussing the roles properly.
- Check that everyone understands their role. Give clarifications if needed. Give the participants about 5 minutes to discuss and decide their roles.
- Ask the groups to stop the discussion as soon as the time is over.
- Invite each group one by one to come and present their interview as a role play.

## Notes for Facilitation

### Facilitating Role Plays

#### Preparing for the activity

1. Carefully review the details of the scenario and the character descriptions.
2. Become familiar with the key issues being addressed in the scenario.
3. Study the provided material so that you are ready to address issues related to the situations depicted in the role plays.
4. Anticipate potential questions that might be raised by the participants and be ready to address them.

#### Conducting the activity

1. Introduce the activity. Emphasize that role playing provides participants with an opportunity to apply their new knowledge, skills, and tools in situations that simulate actual interactions with customers.
2. Ask participants to form pairs. Direct the members of each group to choose who will play the roles. Remind the groups that each participant should be given the opportunity to play/practice the different roles.
3. Conduct a demonstration so that participants become familiar with the expectations related to the roles and support materials.
4. To maintain spontaneity of the interactions during the role play, ask the participants not to discuss the details of their roles prior to the role play.
5. Give the pairs 15-20 minutes to conduct the role play.
6. Circulate among the groups to answer any questions that may arise and provide guidance as needed.
7. After all the pairs have finished with the role play, conduct a de-briefing session on each role play.
8. Ask the groups to take five minutes to talk about what happened during the role play. The groups should discuss the questions given in the de-briefing for each role play. Encourage participants to provide constructive criticism during their discussions.
9. Conclude the activity by asking participants to think about whether and how they might use scripted role plays in their real life.

## Summarize

- Wrap the unit up after summarizing the key points and answering questions.





## UNIT 12.6: Preparing to be an Entrepreneur

### Key Learning Outcomes



At the end of this unit, participants will be able to:

1. Discuss how market research is carried out
2. Describe the 4 Ps of marketing
3. Discuss the importance of idea generation
4. Recall basic business terminology
5. Discuss the need for CRM
6. Discuss the benefits of CRM
7. Discuss the need for networking
8. Discuss the benefits of networking
9. Discuss the importance of setting goals
10. Differentiate between short-term, medium-term and long-term goals
11. Discuss how to write a business plan
12. Explain the financial planning process
13. Discuss ways to manage your risk
14. Describe the procedure and formalities for applying for bank finance
15. Discuss how to manage their own enterprise
16. List the important questions that every entrepreneur should ask before starting an enterprise

## UNIT 12.6.1: Market Study/ The 4Ps of Marketing/ Importance of an IDEA: Understanding Market Research

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how market research is carried out
- Describe the 4 Ps of marketing
- Discuss the importance of idea generation

### Resources to be Used

- Participant Handbook
- Chart papers
- Markers pens
- Blank sheets of paper

### Ask

- Suppose, you want to open a restaurant, what are the factors you will consider?
- How will you promote your restaurant?

### Example

- Let's have a look at this example.

Arjun was an MBA working in a company. But he wanted to start a low cost budget hostel for foreign tourists coming to India. He did a lot of market research before starting the project. Based on the information he gathered, he made his business plan. His hostel is now flourishing and he is thinking of expanding to other tourist destinations.

### Say

- Discuss "Market Study" with the participants. Refer to the Participant Handbook.
- Let's learn about market study and research with the help of an activity.

### Team Activity

#### Market Study

- This is a group activity.
- You want to start your own tuition centre.
- What type of research will you do?

#### Activity De-brief

- Ask each group to come forward and give a brief presentation.
- Encourage other groups to be interactive and ask questions.
- What factors did you keep in mind while doing your research?
- Based on our research would you go ahead and open a tuition centre?

**Do** 

- Instruct the participants that this is group work.
- Divide the class into small groups of 4 or 6.
- Give each group a chart paper.
- Tell the participants that they have to start their own tuition centre.
- Give the participants 10 minutes to discuss and write the research work they need to do.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

**Say** 

- By opening a tuition centre you are offering a service.

**Ask** 

- What factors will you keep in mind before opening it?

**Say** 

- Discuss “The 4Ps of Marketing” with the participants as given in the Participant Handbook.

**Say** 

- Let's learn about the 4Ps of Marketing with the help of an activity.

**Team Activity** **4 Ps of Marketing**

- This is a group activity.
- You have to sell a pen to four different segments:
  1. Rural villagers
  2. Rural middle class
  3. Urban middle class
  4. Upper end rich people (Niche market)

Keeping the 4Ps of Marketing in mind, what marketing strategy will you design to sell the pen?

**Activity De-brief**

- Ask each group to present their strategy.
- Encourage other groups to be interactive and ask questions.

**Do** 

- Instruct the participants that this is group work.
- Divide the class into four groups.
- Give each group a chart paper.
- Assign each group a target audience for selling the pens:
  1. Rural villagers
  2. Rural middle class
  3. Urban middle class

4. Upper end rich people

- Tell the participants that they have to design a marketing strategy keeping the 4Ps of Marketing in mind.
- Give the participants 20 minutes to discuss and come up with their strategy.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit

**Activity De-brief**

- Ask each group to come forward and give a brief presentation.
- Ask each group what they kept in mind while designing their marketing strategy.
- Encourage other groups to be interactive and ask questions.

**Say** 

- Each entrepreneur has an idea of wants he wants to sell. It may be a service or a product.
- Discuss “Importance of an IDEA” as given in the Participant Handbook.

**Summarize** 

- Summarize the key points of the unit.
- Ask the participants what they learnt from the activities.
- Encourage them to ask if they have any doubts.

## UNIT 12.6.2: Business Entity Concepts

### Unit Objectives

At the end of this unit, participants will be able to:

- Recall basic business terminology

### Resources to be Used

- Participant Handbook

### Say

- Let's recall some basic business terminology.
- Discuss the Business Entity Concepts as given in the Participant Handbook.
- Let's learn some basic business terminology by having an activity.
- We will have a quiz today.

### Activity

- The activity is a quiz.

### Do

- Divide the class in two groups and give a name to each group.
- Explain the rules of the quiz. For each correct answer the group gets 1 mark.
- If the group is unable to answer the question is passed to the next group.
- Explain the purpose and duration of the activity.
- Ask the questions of the quiz.
- Keep a score of the groups.
- Set guidelines pertaining to discipline and expected tasks.

### Summarize

- Summarize the unit by discussing the key points.

### Notes for Facilitation

#### QUESTIONS FOR THE QUIZ

1. What does B2B mean?  
*Business to business*
2. What is a financial report?  
*A comprehensive account of a business' transactions and expenses*
3. Who is a sales prospect?  
*A potential customer*
4. How is working capital calculated?  
*Current assets minus current liabilities*

5. What is an estimation of the overall worth of a business called?  
*Valuation*
6. You are buying a house. What type of transaction is it?  
*Complex transaction*
7. How will you calculate the net income?  
*Revenue minus expenses*
8. How is Return on Investment expressed?  
*As percentage*
9. How will you calculate the cost of goods sold?  
*Cost of materials minus cost of outputs*
10. What is revenue?  
*Total amount of income before expenses are subtracted.*
11. What is a Break-Even Point?  
*This is the point at which the company will not make a profit or a loss. The total cost and total revenues are equal.*
12. What is the formula used to calculate simple interest?  
 *$A = P(1 + rt)$ ;  $R = r * 100$*
13. What are the three types of business transactions?  
*Simple, Complex and Ongoing Transactions*
14. The degrading value of an asset over time is known as  
*Depreciation*
15. What are the two main types of capital?  
*Debt and Equity*

## UNIT 12.6.3: CRM & Networking

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the need for CRM
- Discuss the benefits of CRM
- Discuss the need for networking
- Discuss the benefits of networking

### Resources to be Used

- Participant Handbook

### Ask

- Can your business run without customers/buyers?
- Who is the most important entity in any business?

### Say

- The key to every success business lies on understanding the customer's expectations and providing excellent customer service.
- Discuss about CRM and its benefits. Refer to the Participant Handbook.
- Providing excellent customer service entails:
  - Treating your customers with respect.
  - Be available as per their need/ schedule.
  - Handling complaints effectively.
  - Building long lasting relationships.
  - Collecting regular feedback.
- Handle customer complaints proactively. Ask “what happened”, “why it happened”, “how can it be avoided next time”, etc.
- Collecting feedback from the customers regularly will enable you to improve your good/service.
- “Let's understand it better with the help of some case scenarios. You will be given some cases within your groups. You have to analyse the case scenario that has been given to you and then find an appropriate solution to the problem.”

### Do

- Divide the class into four groups of maximum six participants depending on the batch size.
- Give one case study to each group.
- Instruct them to read the case carefully.
- The group is expected to analyse and discuss the case amongst them and find a solution to the given problem.
- Put down the discussion points (de-brief questions) on the board. Give the class 5-10 minutes to discuss the case and note down their solutions.
- At the end of 10 minutes, the team should present their case solution to the class.

## Team Activity

### Case Study Analysis

Raju runs a business of wooden furniture. He has a huge list of customers on Facebook and WhatsApp who give him orders regularly. Ankita is one of his old and regular customers. She placed an order for a new chester and TV cabinet via WhatsApp and requested Raju to send them as soon as possible. When the parcel reached Ankita through courier she found that chester was broken and the TV unit was chipped from the bottom. Ankita was heartbroken. It was a complete waste of money. She sent a message to Raju on WhatsApp, expressing her anger and disappointment. Raju might lose an old customer forever if he doesn't satisfy the customer. What should Raju do to retain his customer?

### Scenario 2

Rajni runs a boutique shop. She sells suits and sarees. She is one of the most successful designer in her city. Rajni swears that all the clothes in her boutique have unique designs. Smita has to attend her cousin's wedding; she goes to Rajni's boutique to buy a saree. Smita wanted a unique designer saree. Rajni customized a saree for her and sent it over the courier. When Smita had a look at the saree she realised her two friends had the same design sarees. She sent a message to Rajni on WhatsApp, expressing her anger and disappointment. Did Rajni make a false promise? Were her designs copied? What could happen to Rajni's image after this incident? What would you do if you were in Rajni's place?

### Scenario 3

Shama is a beautician who offers parlour services to ladies by making home visits. Recently, Shama got her name registered on an e-commerce website. Two days earlier, she got a message from Mrs Sushma. The appointment was fixed for next day, 11:00 am and the remuneration for the services was decided beforehand. When Shama reached there at 10:50 am, Mrs Sushma was not at home. When Shama called her, she asked her to wait for a while. Mrs Sushma reached home at 11:45 am. Meanwhile, Shama had to reschedule her next appointment. After availing Shama's services, Mrs Sushma refused to pay the requisite amount and started finding faults in the services provided by her. Who was at fault in this scenario? What should you do in case the customer behaves unreasonably? What would you do if you were in Shama's place?

### Scenario 4

Shailender is the manager of a car showroom. He proactively takes part in all the transactions that happen in his showroom. Vinita wants to buy a new car. She has chosen a car from Shailender's showroom. The salesperson has given her a very good discount and has also promised free service for one year. Vinita goes to the showroom and asks to complete all the formalities to purchase the car. When she sees the final bill she realize that she has not received the promised discount neither was there any mention of the free services. She immediately demands to see the Shailender. When Shailender's head asks how much discount Vinita was promised, he realised the discount will make the sale in loss. The car showroom owner might lose a customer and deal due to false commitments made by his manager. Besides, the customer might tell this to other people, creating a bad name and image for the showroom. If you owned that showroom, how would you have convinced your customer?

## Say

- Now, let's discuss the problem and solution with the class.
- The group will first briefly describe the case to the class.
- Then discuss the issue identified and the proposed solution.
- Present the solution as a role play.
- Post presentation, the other groups may ask questions from the group that has presented.

**Do** 

- Congratulate each group for the presentation/ role play.
- Ask the audience to applaud for them.
- Keep a check on time. Tell the group to wind up the discussion quickly if they go beyond the given time limit.

**Say** 

- If your customers are happy with you they will give referrals which will help to grow your business.
- One more way of growing business is 'Networking'.
- Discuss Networking and its benefits. Refer to the Participant Handbook.

**Activity** **Group Discussion**

- Conduct a group discussion in the class on how they can do networking for their business.

**Summarize** 

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of CRM and Networking for entrepreneurs.
- Close the discussion by summarizing the importance of CRM and Networking for entrepreneurs.

## UNIT 12.6.4: Business Plan: Why Set Goals?

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss the importance of setting goals
- Differentiate between short-term, medium-term and long-term goals
- Discuss how to write a business plan
- Explain the financial planning process
- Discuss ways to manage your risk

### Resources to be Used

- Participant Handbook
- Chart papers
- Blank papers
- Marker pens
- Ruler

### Ask

- Remember we had written SMART Goals in a previous session? Let's try and recall why it is important to set goals?
- While framing SMART goals, we talked about 'T' in SMART, which was 'Time Bound'? What do we mean by time bound goals?
- What time limit did you set for your goal- 3 weeks, 3 years, 10 years?

### Say

- Talk about short term, long term and medium term goals, as discussed in the Participant Handbook.

### Ask

- As you are planning to become an entrepreneur, you must have thought of an idea for a start-up. What is your business idea?

### Do

- Ask few participants to share their business ideas.

### Ask

- Have you created a business plan for your business idea?
- Do you think it is important to have a business plan in place? Why/ why not?

### Say

- Talk about 'Why Create a Business Plan' as discussed in the Participant Handbook.
- Let's understand it better with the help of an activity.

## Team Activity

### Writing a business Plan

- This is a group activity.
- Give the groups the required resources such as chart paper and markers.
- This activity is divided into two parts:
  1. Create a business idea
  2. Develop a business plan
- The group will discuss and come up with a new business idea and present their idea to the class.
- In the second part of the activity the group will develop a business plan for the business idea.
- The business plan prepared will be presented by the groups to the class.

<b>MY BUSINESS PLAN</b>
Executive Summary: What is your Mission Statement?
Business Description: What is the nature of your business?
Market Analysis: What is your target market?
Organization and Management: What is your company's organizational structure?
Service or Product Line: What is the lifecycle of your product/ service?
Marketing and Sales: How will you advertise and sell your products?
Funding Request: How much fund is required and from where?

## Say

- Teams will need to brainstorm for this part of the activity.
- Use the blank papers for the second part of this activity
- Make your business plan on a chart paper based on the following parameters:
  1. Executive Summary
  2. Business Description
  3. Market Analysis
  4. Organization and Management
  5. Service or Product Line
  6. Marketing and Sales
- Explain each parameter in detail as done in the Participant Handbook.
- Discuss each parameter with the business idea examples of the groups.
- Groups will discuss and develop the business plan for their business idea.

Say 

- Now, let's share our plan with the class.
- Each group will briefly describe the plan to the class.
- Post presentation, the other groups may ask questions to the group who have presented their plan.

Do 

- Congratulate each group for sharing their points.
- Ask the audience to applaud for them.
- Keep a check on time. Tell group to wind up the discussion quickly if they go beyond the given time limit.

Say 

- Along with a business plan, you need to create a financial plan and evaluate the risk involved with your start up.
- Discuss 'Financial Planning' and 'Risk Management' in detail as given in the Participant Handbook.

Summarize 

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

Notes for Facilitation 

- Keep the business plan format ready in a flipchart to display it during the activity.

## UNIT 12.6.5: Procedures and Formalities for Bank Finance

### Unit Objectives

At the end of this unit, participants will be able to:

- Describe the procedure and formalities for applying for bank finance

### Resources to be Used

- Participant Handbook
- Bank loan/finance form sample

### Ask

- While preparing a business plan in the last session, we discussed financial planning to arrange financial resources for your start-up. Therefore, how will you collect funds to start your business?

### Say

- While most entrepreneurs think 'product' is the most difficult thing to decide for a business, start-up capital poses an even a bigger obstacle. Though there are various ways of funding the business, to convince investors to invest money is the most challenging.
- Some of the funding options available in India are:
  - ♦ **Bootstrapping:** Also called self-financing is the easiest way of financing
  - ♦ **Crowd funding:** Funds are collected by consumers pre-ordering or donating for starting the business.
  - ♦ **Angel investors:** Individual or group of investors investing in the company
  - ♦ **Venture capitalists:** Venture capitals are professionally managed funds who invest in companies that have huge potential. They usually invest in a business against equity.
  - ♦ **Bank loans:** The most popular method in India.
  - ♦ **Microfinance Providers or NBFCs**
  - ♦ **Government programmes**
- Let us know discuss the most popular method i.e. bank finance in detail here.

### Do

- Discuss the list of documents that are required to apply for a loan like letter of introduction, business brochure, references of other banks, and financial statements.
- Explain the details to be filled in a loan application form.
- Divide the class into groups. Give each group a loan application form.
- Ask the groups to discuss and fill the form.

### Summarize

- Close the discussion by summarizing the important documents needed for bank loan.
- Ask the participants if they have any questions related to what they have talked about so far.

## Notes for Facilitation

- Checklist of documents is provided as resources for the session.
- You can make some copies and distribute it during the group activity.
- Download sample loan application forms from any nationalised bank's website. Print sufficient copies to circulate it amongst the groups.

<b>CHECKLIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH LOAN APPLICATION (Common for all banks)</b>
1. Audited financial statements of the business concern for the last three years
2. Provisional financial statements for the half – year ended on _____
3. Audited financial statements of associate concern/s for the last three years
4. Copy of QIS II for the previous quarter ended on _____
5. Operational details in Annexure I
6. CMA data for the last three years, estimates for current year and projection for the next year
7. Term loan/DPG requirements in Annexure II
8. List of machinery in respect of machinery offered as security in Annexure III
9. Additional details for export advances furnished in Annexure IV
10. Property statements of all directors/partners/proprietor/guarantors
11. Copies of ITAO of the company for the last three years
12. Copies of ITAOs/WTAOs of the directors/partners/proprietor and guarantors
12. Copies of certificate from banks and financial institutions certifying the latest liability with them
14. Copy of board resolution authorizing the company to apply to your bank for the credit facilities mentioned in application
15. Copy of memorandum and article of association (in case of limited company)/partnership deed (in case of partnership firm)
16. Cash budget for the current year and next year in case of contractors and seasonal industries

## UNIT 12.6.6: Enterprise Management – An Overview: How to Manage Your Enterprise?

### Unit Objectives

At the end of this unit, participants will be able to:

- Discuss how to manage their own enterprise

### Resources to be Used

- Participant Handbook

### Ask

- Having set-up a business, do you think it is possible to do everything on your own?
- Does one require trained persons for help?
- What does management mean?

### Say

- Let's have a look at this example:

Kapil had a small business that was beginning to pick up pace. He wanted to expand his business, and therefore employed few more people. One day, as he was walking past Ramesh, one of his new employees, he overheard Ramesh talking rudely to a customer on the phone. This set him thinking. Kapil realised that he should have regular team meetings to motivate his employees and speak with them about any problems they might be facing during work. He should also conduct training sessions on new practices, soft skills, and technology, and develop work ethics manual for managing his enterprise.

### Say

- Was Kapil correct in his approach or he should have scolded Ramesh instantly in front of his other employees?
- Discuss “Enterprise Management – An Overview” with the participants as given in the Participant Handbook.

### Say

- Let's learn how to effectively manage an enterprise or business through an activity.

### Team Activity

#### Enterprise Management

- This is a group activity.
- Design a matrix listing the topics and key words that are needed to run an enterprise effectively and smoothly.

#### Activity De-brief

- Have each group present their matrix.
- Encourage participants of the other groups to ask question about each other's presentation.

## Do

- Instruct the participants that this is group work.
- Divide the class into small groups of 4.
- Give each group a chart paper and coloured pen.
- Tell the participants that they have to make a matrix they need to fill.
- They have to write the main topics and key words that will help them effectively manage their enterprise.
- Give the participants 15 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

## Summarize

- Ask the participants what they have learned from this exercise/activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of effective management to run an enterprise as given in the Participant Handbook.

## UNIT 12.6.7: 20 Questions to Ask Yourself before Considering Entrepreneurship

### Unit Objectives

At the end of this unit, participants will be able to:

- List the important questions that every entrepreneur should ask before starting an enterprise

### Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

### Ask

- Why do you want to become an entrepreneur?

### Say

- It is very important to know why you want to become an entrepreneur. Your personal goals for becoming an entrepreneur play a key role in the success of your business. Your goals should be clear well before you start your business.
- Apart from the goals, the other aspects of business that you need to bear in mind are the potential problems that you may face to set-up, your areas of interest, and all the other dimensions of the business.
- Let's understand it better with the help of some questions that every entrepreneur should ask before starting their own business.
- Open the Participant Handbook section named '20 Questions to Ask Yourself Before Considering Entrepreneurship'. You have to answer the questions individually.
- Then, we will have a class discussion on all the questions.

### Do

- Read out the questions one by one in front of all the participants.
- Participants have to answer all the one by one questions.
- Give the class 10-15 minutes to note down their answers.
- At the end of 15 minutes, open the discussion for all the questions.
- Moderate the discussion by focusing on the relevant points.
- Keep a check on time and don't let the discussion get sabotaged or lose track of time. Ensure all the questions are covered and discussed.

### Summarize

- Ask the participants what they have learned from this exercise/activity.
- Ask if they have any questions related to what they have talked about so far.





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## 13. Annexures

Annexure I: Training Delivery Plan

Annexure II: Assessment Criteria



## Annexure I

### Training Delivery Plan

Training Delivery Plan			
<b>Program Name:</b>	Certificate Course in Fitter: Electrical Assembly		
<b>Qualification Pack Name &amp; Ref. ID</b>	Fitter: Electrical Assembly - ISC/Q1001		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	07-07-2016
<b>Pre-requisites to Training (if any)</b>	Minimum qualification – 12 <sup>th</sup> standard (Science) / ITI Pass		
<b>Training Outcomes</b>	<p><b>By the end of this program, the participants will be able to:</b></p> <ol style="list-style-type: none"> <li>1. Prepare for assembling operation</li> <li>2. Assemble the electrical components</li> <li>3. Perform post - assembly activities</li> <li>4. Carry out housekeeping</li> <li>5. Carry out reporting and documentation</li> <li>6. Carry out quality checks</li> <li>7. Carry out problem identification and escalation</li> <li>8. Use basic health and safety practices at the workplace</li> <li>9. Work effectively with others</li> </ol>		

Sl. No	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/ Aids	Duration
1	Over view of Iron & Steel Industry	Icebreaker	<ul style="list-style-type: none"> <li>• Introduce each other</li> <li>• Build rapport with fellow students and the facilitator</li> </ul>		Group Activity: Passing the Parcel	Available objects such as a book, pen, duster etc.	0.5 hours
2	Over view of Iron & Steel Industry	Overview of steel industry and steel industries in India	<ul style="list-style-type: none"> <li>• Understanding Iron &amp; steel industry</li> <li>• Understanding types of Iron &amp; Steel Industry</li> <li>• Understanding products of Iron &amp; Steel industry</li> <li>• Activities in Iron &amp; Steel Industry</li> </ul>	NA	Facilitator-led-discussion Videos	PPTs of Iron and steel manufacturing, Charts showing the same	3.5 hrs

3	Occupational, Health and Safety (OHAS)	Hazards at the site, control measures, PPE, safe working at heights and confined spaces, safe working practices	<ul style="list-style-type: none"> <li>Understanding the Occupational health &amp; Safety</li> <li>Understand What is hazard</li> <li>Working at Heights, confined spaces</li> </ul>	ISC/N0008 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC12, PC13, PC25, PC26 KB3, KB4, KB5, KB6, KB7, KB8, KB9, KB10, KB11, KB12, KB13. KB21, KB22	<ul style="list-style-type: none"> <li>Facilitator-led-discussion</li> <li>Skill Practice (Activity)</li> </ul>	PPTs for OHAS related to Job Role, Display Material for PPEs related to Job Role, Safety Material	24 hrs
4	5S & House keeping	5S safety system, waste management and housekeeping practices	<ul style="list-style-type: none"> <li>Identification of bottlenecks in functioning of work place</li> <li>Various methods of housekeeping both pre-work &amp; post-work as well</li> </ul>	ISC/N1004 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9	<ul style="list-style-type: none"> <li>Facilitator-led-discussion</li> <li>Skill Practice (Activity)</li> </ul>	PPTs of 5S, Display Charts of 5S, Audit Checklists of 5S	22 hrs
5	Hand tools, measuring instruments	Tools and measuring instruments required	<ul style="list-style-type: none"> <li>Knowing of tools</li> <li>Work wise recognition of tools</li> <li>Diagnosing the common defects of tools</li> <li>Using of hand tools</li> <li>Using of measuring instruments</li> </ul>	ISC/N1001 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11 KB 1, KB2, KB3, KB4, KB5, KB6	<ul style="list-style-type: none"> <li>Facilitator-led-discussion</li> <li>Skill Practice (Activity)</li> </ul>	PPTs for various types of Machine drawings, work instructions, Hand tools for fitter, measuring instruments & precision measuring instruments	12 hrs
6	Common Electrical Machines & their working in Iron and Steel Industry	Motors, generators, compressor, pump, EOT crane and electrical accessories	<ul style="list-style-type: none"> <li>Knowing following machines and understanding their workings</li> <li>Motors &amp; pumps</li> <li>Compressors &amp; Generators</li> <li>Electrical Panel &amp; EOT Cranes</li> </ul>	ISC/N1001 PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19 KB7, KB8, KB9, KN10, KB11	<ul style="list-style-type: none"> <li>Facilitator-led-discussion</li> <li>Skill Practice (Activity)</li> </ul>	Display charts and physical Motors Pumps, Compressors and Panels	24 hrs

7	Assembling and dismantling of common machines on the worksite	Material preparation, jointing techniques, machine installation, tools selection and handling	<ul style="list-style-type: none"> <li>• Understanding the engineering drawings</li> <li>• Prepare equipment to perform the assembling of components</li> <li>• Ensure material appropriateness for assembly</li> <li>• Ensuring housekeeping and safety on the shop floor</li> <li>• Proper identification of tools and tackles</li> <li>• Correct handling of tools and tackles</li> <li>• Documentation of defects and reporting's</li> </ul>	ISC/N1002 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19  KB 1, KB2, KB3, KB4, KB5, KB6, KB7, KB8	<ul style="list-style-type: none"> <li>• Facilitator-led-discussion</li> <li>• Skill Practice (Activity)</li> </ul>	Electrical machines display/ Drawings/ Blueprints, Tools and Equipment's, Different types of cables, switch, socket, relay, MCB, Contactors etc., Electrical machines	144 hrs
8	Post -Assembly Activities	Testing technique, Machine maintenance, lubrication	<ul style="list-style-type: none"> <li>• Testing of assembled machine/ equipment/ electrical panels</li> <li>• Disposal of waste</li> <li>• Ensuring housekeeping and safety on the shop-floor</li> </ul>	ISC/N1003 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14 PC15 KB 1, KB2, KB3, KB4, KB5, KB6, KB7, KB8, KB9, KB10, KB11, KB12	<ul style="list-style-type: none"> <li>• Facilitator-led-discussion</li> <li>• Skill Practice (Activity)</li> </ul>	Lubricant and coolant	28 hrs
9	Carry out Housekeeping	Housekeeping practices and elements of housekeeping practices	<ul style="list-style-type: none"> <li>• Preparing for Housekeeping Activities</li> <li>• Carry out Housekeeping Activities</li> <li>• Post Housekeeping Activities</li> </ul>	ISC/N1004 PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC22	<ul style="list-style-type: none"> <li>• Facilitator-led-discussion</li> <li>• Skill Practice (Activity)</li> </ul>	Material and Equipment for cleaning	10 hrs

10	Carry out reporting and documentation	Accident and incident reporting	<ul style="list-style-type: none"> <li>• Reporting</li> <li>• Documentation</li> <li>• Recording</li> <li>• Information Security</li> </ul>	ISC/N1005 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10	<ul style="list-style-type: none"> <li>• Facilitator-led-discussion</li> <li>• Skill Practice (Activity)</li> </ul>	Sample Documents for reporting, documentation and recording	6 hrs
11	Carry out quality checks	Quality checks, visual inspection, destructive and non-destructive tests	<ul style="list-style-type: none"> <li>• Carrying out quality checks to identify problems</li> <li>• Take corrective actions</li> <li>• Reporting the result</li> </ul>	ISC/N1006 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14	<ul style="list-style-type: none"> <li>• Facilitator-led-discussion</li> <li>• Skill Practice (Activity)</li> </ul>	Sample quality Controlling formats	11 hrs
12	Carry out problem identification and escalation	Escalation matrix, problem identification and escalation, accident and incident reporting	<ul style="list-style-type: none"> <li>• Identify problems across:</li> <li>• Materials</li> <li>• Products</li> <li>• Equipment</li> <li>• Others</li> <li>• Take corrective action</li> <li>• Escalation of unresolved identified problems</li> </ul>	ISC/N1007 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC22, PC23, PC24	<ul style="list-style-type: none"> <li>• Facilitator-led-discussion</li> <li>• Skill Practice (Activity)</li> </ul>	Sample Documents for reporting, documentation and recording	12 hrs
13	Use basic health and safety practices at the workplace	Fire safety, use of fire extinguisher, fire drill, emergency rescue and first aid techniques	<ul style="list-style-type: none"> <li>• Health and safety procedures</li> <li>• Fire safety procedures</li> <li>• Emergencies, rescue and first aid procedures</li> </ul>	ISC/N0008 PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC22, PC23, PC24, KB14, KB15, KB16, KB17, KB18, KB19, KB20	<ul style="list-style-type: none"> <li>• Facilitator-led-discussion</li> <li>• Skill Practice (Activity)</li> </ul>	PPE, Different Type of Safety Sign, First Aid Box, Safety instrument and clothing, Step Ladder, Sample Accident reports, Fire Extinguishers, Items required for fire extinguisher and fire Safety	12 hrs

14	Work effectively with others	Effective communication, team work, workplace etiquettes	<ul style="list-style-type: none"> <li>• Ensure appropriate communication with superiors, peers and others as applicable at work place</li> <li>• Demonstrate appropriate behaviour and etiquette at work place</li> </ul>	ISC/N0009 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, KA1, KA2, KA3, KA4	<ul style="list-style-type: none"> <li>• Facilitator-led-discussion</li> <li>• Skill Practice (Activity)</li> </ul>	Communication skills PPTs, Posters Team management posters	7 hrs
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## Annexure II

### Assessment Criteria

#### CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria for Fitter – Electrical assembly	
Job Role	Fitter: Electrical Assembly
Qualification Pack	ISC/Q1001
Sector Skill Council	Indian Iron & Steel Sector Skill Council

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on these criteria.
5	To pass the Qualification Pack , every trainee should score a minimum of 60% in every NOS.
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

Assessment outcome (NOS Code and Description)	Assessment criteria (PC)	Total Marks	Assessment outcome (NOS Code and Description)	Marks Allocation Assessment criteria (PC)	Total Marks
<b>1. ISC/N1001: Prepare for assembling operation</b>	PC1. Understand assembly blueprints, engineering drawings and other specifications to identify the sequence of activities required to assemble the machine	150	10	5	5
	PC2. Read and interpret engineering drawings to ensure correct limits, tolerance and fits of equipment components		10	5	5
	PC3. Report and rectify cases of inappropriate information in design documents as per organizational procedures		7	3	4

	PC4. Identify tools and equipment required to perform the assembling of Components		5	2	3
	PC5. Collect tools required during the assembling process		4	0	4
	PC6. Ensure that tools match the desired specifications		5	2	3
	PC7. Ensure tools and equipment required for assembly are free from physical damage and ready for operation		5	2	3
	PC8. Report damaged / defective components of equipment as per the escalation matrix		8	2	6
	PC9. Ensure the calibration status of all measuring equipment and instruments		8	2	6
	PC10. Prepare the foundation base as per the job requirements i.e. cleaning using hand files, scraper etc.		10	4	6
	PC11. Use braces, jacks, clamps, ropes or bolt straps to hold parts in position		5	2	3
	PC12. Collect work pieces/ components to be assembled		4	2	2
	PC13. Ensure that each material is in the correct quantity		4	2	2
	PC14. Ensure, by visual inspection, that work pieces are of desired quality (free of rust, type of metal, etc.)		8	2	6
	PC15. Ensure that paint, grease, rust, or other contaminants are removed from work pieces		4	2	2
	PC16. Smoothen out the metal work piece prior to assembling		8	2	6
	PC17. Ensure that no delays are caused as a result of improper preparation and failure to identify problems		4	2	2
	PC18. Ensure housekeeping and safety in work area		4	0	4

	PC19. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits		4	0	4
	PC20. Ensure use of mask during grinding to avoid inhaling the dust		4	0	4
	PC21. Ensure that the loose and torn clothes are not worn during working hours		4	0	4
	PC22. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury		5	2	3
	PC23. Adhere to all other safety norms (like wearing shoes, gloves, safety goggles etc)		5	2	3
	PC24. Ensure that unpermitted materials such as fuels, paints etc are removed from the work area		5	2	3
	PC25. Comply with health, safety, environment guidelines, regulations etc in accordance with organizational SOP		5	2	3
	PC26. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP		5	2	3
	NOS Total Marks	Total	150	51	99
<b>2. ISC/N1002: Assemble the electrical components</b>	PC1. Ensure all tools and equipment required during assembly are ready for operation	150	8	2	6
	PC2. Ensure the calibration status of all measuring equipment and instruments		8	4	4
	PC3. Prepare control cables, electrical components like MCB's, Contactors, Relays etc. as per drawing requirement		20	5	15
	PC4. Lift and move components using handling equipment such as hoist or crane or manual methods		8	2	6
	PC5. Use file, chisel and grind parts to align or level the components to be assembled as per the design/ manufacturers' specifications		10	0	10

	PC6. Demonstrate use of machinery such as insulation testers, multi meters, etc knife to cut or bore holes in the structure		10	0	10
	PC7. Demonstrate use of tools such as saws, cutting torches, pipe thread or benders to cut, thread or bend parts as per the specifications		14	4	10
	PC8. Fasten mechanical components/ subassemblies together using screws, bolts, and collars using hand/ power tools		11	4	7
	PC9. Set and adjust linkages, tensions and clearances of assembled components to specifications using fixed gauges and hand tools		11	4	7
	PC10. Use of wires, stripers, crimping tools and other insulated tools		5	2	3
	PC11. Ensure housekeeping and safety in work area		5	2	3
	PC12. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits		5	2	3
	PC13. Ensure use of mask during grinding to avoid inhaling the dust		5	2	3
	PC14. Ensure that the loose and torn clothes are not worn during working hours		5	2	3
	PC15. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury		5	2	3
	PC16. Adhere to all other safety norms (like wearing electrical safety shoes, gloves, safety goggles etc.)		5	2	3
	PC17. Comply with health, safety, environment guidelines, regulations etc. in accordance with organizational SOP		5	2	3
	PC18. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP		5	2	3
	PC 19. Ensure use of insulated hand gloves and electrical safety shoes		5	2	3
	NOS Total Marks	Total	150	45	150

<b>3. ISC/N1003: Perform post - assembly activities</b>	PC1. Connect the hydraulic, electrical and other components of the machine/electrical panels	100	10	3	7
	PC2. Add lubricants and coolants into moving parts as per specifications		10	3	7
	PC3. Carry out functional test of assembled machine/electrical panels to ensure it performs as per desired performance criteria		10	3	7
	PC4. Identify and rectify the problem areas during the functional tests		10	3	7
	PC5. Check the panel interlock and protection logic		10	3	7
	PC6. Dispose-off waste material as per waste disposal procedures laid down by the company		5	2	3
	PC7. Carry out disposal of waste material safely		4	2	2
	PC8. Ensure housekeeping and safety in work area		4	0	4
	PC9. Ensure that the exhaust systems are used to maintain the concentration levels of various particulate matters remain within limits		4	0	4
	PC10. Ensure that the loose and torn clothes are not worn during working hours		4	0	4
	PC11. Ensure using hoist or forklift for lifting heavy materials to avoid physical injury		4	0	4
	PC12. Adhere to all other safety norms (like wearing electrical shoes, gloves, safety goggles etc.)		4	0	4
	PC13. Remove unpermitted materials such as fuels, paints etc. from the work area		6	2	4
	PC14. Comply with health, safety, environment guidelines, regulations etc. in accordance with organizational SOP		5	2	3
	PC15. Identify any potential health hazards or dangers and escalate to supervisor as per organizational SOP		5	2	3
	<b>NOS Total Marks</b>	<b>Total</b>	<b>100</b>	<b>27</b>	<b>73</b>

<b>4. ISC/N1004: Carry out housekeeping</b>	PC1. Inspect the area while taking into account various surfaces	50	2	1	1
	PC2. Identify the material requirements for cleaning the areas inspected, by considering risk, time, efficiency and type of stain		2	1	1
	PC3. Ensure that the cleaning equipment is in proper working condition		2	1	1
	PC4. Select the suitable alternatives for cleaning the areas in case the appropriate equipment and materials are not available and inform the appropriate person		2	1	1
	PC5. Plan the sequence for cleaning the area to avoid re-soiling clean areas and surfaces		2	1	1
	PC6. Inform the affected people about the cleaning activity		2	1	1
	PC7. Display the appropriate signage for the work being conducted		2	1	1
	PC8. Ensure that there is adequate ventilation for the work being carried out		3	1	2
	PC9. Wear the personal protective equipment required for the cleaning method and materials being used		3	1	2
	PC10. Use the correct cleaning method for the work area, type of soiling and surface		2	1	1
	PC11. Carry out cleaning activity without disturbing others		2	1	1
	PC12. Deal with accidental damage, if any, caused while carrying out the work		2	1	1
	PC13. Report to the appropriate person any difficulties in carrying out your work		2	1	1
	PC14. Identify and report to the appropriate person any additional cleaning required that is outside one's responsibility or skill		2	1	1

	PC15. Ensure that there is no oily substance on the floor to avoid slippage		2	1	1
	PC16. Ensure that no scrap material is lying around		2	1	1
	PC17. Maintain and store housekeeping equipment and supplies		4	1	3
	PC18. Follow workplace procedures to deal with any accidental damage caused during the cleaning process		4	1	3
	PC19. Ensure that, on completion of the work, the area is left clean and dry and meets requirements		2	1	1
	PC20. Return the equipment, materials and personal protective equipment that were used to the right places making sure they are clean, safe and securely stored		2	1	1
	PC21. Dispose the waste garnered from the activity in an appropriate manner		2	1	1
	PC22. Dispose of used and un-used solutions according to manufacturer's instructions, and clean the equipment thoroughly		2	1	1
	<b>NOS Total Marks</b>	<b>Total</b>	<b>50</b>	<b>22</b>	<b>28</b>
<b>5. ISC/N1005: Carry out reporting and documentation</b>	PC1. Report data/problems/incidents as applicable in a timely manner	50	5	2	3
	PC2. Report to the appropriate authority as laid down by the company		5	2	3
	PC3. Follow reporting procedures as prescribed by the company		5	2	3
	PC4. Identify documentation to be completed relating to one's role		5	2	3
	PC5. Record details accurately an appropriate format		5	2	3
	PC6. Complete all documentation within stipulated time according to company procedure		5	2	3

	PC7. Ensure that the final document meets with the requirements of the persons who requested it or make any amendments accordingly		5	2	3
	PC8. Make sure documents are available to all appropriate authorities to inspect		5	2	3
	PC9. Respond to requests for information in an appropriate manner whilst following organizational procedures		5	2	3
	PC10. Inform the appropriate authority of requests for information received		5	2	3
	NOS Total Marks	Total	50	20	30
<b>6. ISC/N1006: Carry out quality checks</b>	PC1. Ensure that total range of checks are regularly and consistently performed	150	8	3	5
	PC2. Use appropriate measuring instruments, equipment, tools, accessories etc. ,as required		8	3	5
	PC3. Identify non-conformities to quality assurance standards		10	5	5
	PC4. Identify potential causes of non- conformities to quality assurance standards		16	6	10
	PC5. Identify impact on final product due to non-conformance to company standards		16	6	10
	PC6. Evaluating the need for action to ensure that problems do not recur		14	6	8
	PC7. Suggest corrective action to address problem		14	6	8
	PC8. Review effectiveness of corrective action		10	5	5
	PC9. Interpret the results of the operator level quality check correctly		10	5	5
	PC10. Inform any non-conformity to the appropriate authority within the stipulated time		5	2	3
	PC11. Record of results of action taken		10	5	5

	PC12. Record adjustments not covered by established procedures for future reference		10	5	5
	PC13. Review effectiveness of action taken		10	5	5
	PC14. Follow reporting procedures where the cause of defect cannot be identified		9	6	3
	NOS Total Marks	Total	150	68	82
<b>7. ISC/N1007: Carry out problem identification and escalation</b>	PC1. Identify defects/ indicators of problems	100	3	0	3
	PC2. Identify any wrong practices that may lead to problems		3	0	3
	PC3. Identify practices that may impact the final product quality		3	0	3
	PC4. Identify if the problem has occurred before		2	0	2
	PC5. Identify other operations that might be impacted by the problem		2	0	2
	PC6. Ensure that no delays are caused as a result of failure to escalate problems		3	0	3
	PC7. Take appropriate materials and sample to conduct tests		7	2	5
	PC8. Evaluate results to confirm suspected reasons for non-conformance (where required)		5	2	3
	PC9. Consider possible reasons for identification of problems		4	2	2
	PC10. Consider applicable corrections and formulate corrective action		5	2	3
	PC11. Formulate action in a timely manner		5	2	3
	PC12. Communicate problem/ remedial action to appropriate parties		4	2	2
	PC13. Take corrective action in a timely manner		4	2	2

	PC14. Report/document problem and corrective action in an appropriate manner		4	2	2
	PC15. Monitor corrective action		5	2	3
	PC16. Evaluate implementation of corrective action taken to determine if the problem has been resolved		4	2	2
	PC17. Ensure that corrective action selected is viable and practical		5	2	3
	PC18. Ensure that correct solution is identified to an identified problem		4	2	2
	PC19. Take corrective action for problems identified according to the company procedures		5	2	3
	PC20. Ensure that no delays are caused as a result of failure to take necessary action		5	2	3
	PC21. Escalate problem as per laid down escalation matrix		4	2	2
	PC22. Escalate the problem within stipulated time		4	2	2
	PC23. Escalate the problem in an appropriate manner		5	2	3
	PC24. Ensure that no delays are caused as a result of failure to escalate problems		5	2	3
	NOS Total Marks	Total	100	36	64
<b>8. ISC/N0008: Use basic health and safety practices at the workplace</b>	PC1. Use protective clothing/ equipment for specific tasks and work conditions	150	9	4	5
	PC2. State the name and location of people responsible for health and safety in the workplace		6	1	5
	PC3. State the names and location of documents that refer to health and safety in the workplace		2	1	1
	PC4. Identify job-site hazardous work and state possible causes of risk or accident in the workplace		8	4	4

	PC5. Carry out safe working practices while dealing with hazards to ensure the safety of self and others state methods of accident prevention in the work environment of the job role		6	1	5
	PC6. State location of general health and safety equipment in the workplace		6	1	5
	PC7. Inspect for faults, set up and safely use steps and ladders in general use		6	1	5
	PC8. Work safely in and around trenches, elevated places and confined areas		6	1	5
	PC9. Lift heavy objects safely using correct procedures		6	1	5
	PC10. Apply good housekeeping practices at all times		2	1	1
	PC11. Identify common hazard signs displayed in various areas		6	5	1
	PC12. Retrieve and/or point out documents that refer to health and safety in the workplace		5	1	4
	PC13. Use the various appropriate fire extinguishers on different types of fires correctly		9	4	5
	PC14. Demonstrate rescue techniques applied during fire hazard		8	4	4
	PC15. Demonstrate good housekeeping in order to prevent fire hazards		2	1	1
	PC16. Demonstrate the correct use of a fire extinguisher		6	1	5
	PC17. Demonstrate how to free a person from electrocution		6	1	5
	PC18. Administer appropriate first aid to victims as required e.g. in case of bleeding, burns, choking, electric shock, poisoning etc.		8	3	5
	PC19. Demonstrate basic techniques of bandaging		6	1	5

	PC20. Respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments		7	2	5
	PC21. Perform and organize loss minimization or rescue activity during an accident in real or simulated environments		6	1	5
	PC22. Administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases		6	1	5
	PC23. Demonstrate the artificial respiration and the CPR Process		6	1	5
	PC24. Participate in emergency procedures		6	1	5
	PC25. Complete a written accident/incident report or dictate a report to another person, and send report to person responsible		4	1	3
	PC26. Demonstrate correct method to move injured people and others during an emergency		2	1	1
	NOS Total Marks	Total	150	45	105
<b>9. ISC/N0009: Work effectively with others</b>	PC1. Accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required	100	10	5	5
	PC2. Accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt		10	5	5
	PC3. Provide information to others clearly, at a pace and in a manner that helps them to understand		10	0	10
	PC4. Display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible		10	5	5
	PC5. Consult with and assist others to maximize effectiveness and efficiency in carrying out tasks		10	5	5

	PC6. Display appropriate communication etiquette while working		10	0	10
	PC7. Display active listening skills while interacting with others at work		10	0	10
	PC8. Use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism		10	5	5
	PC9. Demonstrate responsible and disciplined behaviors at the workplace		15	5	10
	PC10. Escalate grievances and problems to		5	0	5
	NOS Total Marks	Total	100	30	70

## Do



- Explain each Guideline for Assessment in detail
- Explain the score that each trainee needs to obtain
- Recapitulate each NOS one-by-one and take participants through the allocation of marks for Theory and Skills Practical.
- Explain the Allocation of Marks. Explain that they will be assessed on Theory and Skills Practical.
- Explain that for the first NOS, 51 marks are allotted for Theory and & 99 for Skills Practical.







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