



**Skill India**  
कौशल भारत - कुशल भारत



सत्यमेव जयते  
GOVERNMENT OF INDIA  
MINISTRY OF SKILL DEVELOPMENT  
& ENTREPRENEURSHIP



N S D C  
National  
Skill Development  
Corporation

Transforming the skill landscape



Skilling India in Electronics

# Facilitator Guide



Sector  
Electronics

Sub-Sector  
Industrial Electronics

Occupation  
Sales and After Sales Service

Reference ID: ELE/Q7201, Version 1.0  
NSQF Level: 4

**Field  
Technician:  
UPS and  
Inverter**

## Published by

All Rights Reserved,  
First Edition, December 2016

Printed in India at  
New Delhi – 110016

## Copyright © 2017

Electronics Sector Skills Council of India  
602-608, 6th Floor, Ansal Chambers-II, Bhikaji Cama Place,  
New delhi-110066  
E-mail: [info@essc-india.org](mailto:info@essc-india.org)

## Disclaimer

The information contained herein has been obtained from sources reliable to ESSCI. ESSCI disclaims all warranties to the accuracy, completeness or adequacy of such information. ESSCI shall have no liability for errors, omissions, or inadequacies, in the information contained herein, or for interpretations thereof. Every effort has been made to trace the owners of the copyright material included in the book. The publishers would be grateful for any omissions brought to their notice for acknowledgements in future editions of the book. No entity in ESSCI shall be responsible for any loss whatsoever, sustained by any person who relies on this material. The material in this publication is copyrighted. No parts of this publication may be reproduced, stored or distributed in any form or by any means either on paper or electronic media, unless authorized by the ESSCI.





**Shri Narendra Modi**  
Prime Minister of India

“ Skilling is building a better India.  
If we have to move India towards  
development then Skill Development  
should be our mission. ”



## Acknowledgements

The need for having a standard curriculum for the Job Role based Qualification Packs under the National Skills Qualification Framework was felt necessary for achieving a uniform skill based training manual in the form of a Facilitator Guide.

I would like to take the opportunity to thank everyone who contributed in developing this Guide for the QP Field Technician – UPS and Inverter.

The Guide is the result of tireless pursuit to develop an effective tool for imparting the Skill Based training in the most effective manner.

I would like to thank the team of KontentEdge for their support to develop the content, the SME and the team at the ESSCI along with the industry partners for the tireless effort in bringing the Guide in the current format.

CEO

Electronics Sector Skills Council of India

## About this Guide

This Facilitator Guide is designed to enable training for the specific Qualification Pack (QP).

Each National Occupational (NOS) is covered across Unit/s.

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



Notes



Objectives



Do



Explain



Ask



Practical



Team Activity



Facilitation Notes



Learning  
Outcomes



Say



Example



Resources

## Table of Contents

S.No.	Modules and Units	Page No.
1.	<b>Basics of Uninterrupted Power Supply (UPS) and Inverter (ELE/N0061)</b>	3
	Unit 1.1 – Basics of Electronics and Electronic Components	5
	Unit 1.2 – Fundamentals of Electricity	10
	Unit 1.3 – Introduction to UPS and Inverters	13
	Unit 1.4 – Tools and Equipment	19
2.	<b>Role of a Field Technician – UPS Inverter (ELE/N7201)</b>	24
	Unit 2.1 – Responsibility of a Field Technician	25
	Unit 2.2 – Understanding the Requirement of Customer	28
	Unit 2.3 – Organizational Context	29
	Unit 2.4 – Health and Safety Norms	31
	Unit 2.5 – Improving Work Process	33
3.	<b>Working with UPS/Inverter (ELE/N7202)</b>	40
	Unit 3.1 - Install the UPS/Inverter	41
	Unit 3.2 - Repair Dysfunctional UPS/Inverter	48
4.	<b>Interact with Co-workers (ELE/N9962)</b>	73
	Unit 4.1 – Interact with Supervisor	74
	Unit 4.2 – Interact with Colleagues	76
	Unit 4.3 – Soft Skills	78
5.	<b>Employability &amp; Entrepreneurship Skills</b>	81
	Unit 5.1 - Personal Strengths & Value Systems	85
	Unit 5.2 - Digital Literacy: A Recap	119
	Unit 5.3 - Money Matters	127
	Unit 5.4 - Preparing for Employment & Self-Employment	144
	Unit 5.5 - Understanding Entrepreneurship	164
	Unit 5.6 - Preparing to be an Entrepreneur	192
6.	<b>Annexures</b>	215
	Annexure 1 - Training Delivery Plan	216
	Annexure 2 - Assessment Criteria	225











**Skill India**  
कौशल भारत - कुशल भारत



सत्यमेव जयते  
GOVERNMENT OF INDIA  
MINISTRY OF SKILL DEVELOPMENT  
& ENTREPRENEURSHIP



N S · D · C  
National  
Skill Development  
Corporation

Transforming the skill landscape



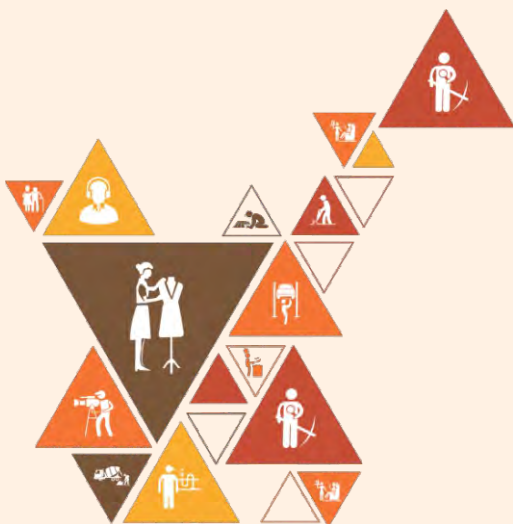
# 1. Basics of Uninterrupted Power Supply (UPS) and Inverter

Unit 1.1 – Basics of Electronics and Electronic Components

Unit 1.2 – Fundamentals of Electricity

Unit 1.3 – Introduction to UPS and Inverters

Unit 1.4 – Tools and Equipment



(ELE/N0061)

## Key Learning Outcomes



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

- Explain the basics of electronics
- Identify the electronic components
- Explain fundamentals of electricity
- Describe UPS and Inverter
- List tools and equipment used for installing and repairing UPS/Inverter

## UNIT 1.0: Basics of UPS/Inverter

### Objective of the Module

The objective of this module is to make the participants familiar with the basics of electronics. The participants will be able to identify electronic components. They will also be introduced to the fundamentals of electricity which comprises of concepts related to Ohm's law and Kirchoff's law. In addition, they would be told about the basics of UPS/Inverter, comprising its types, modules, functionalities and applications, to enable them perform installation and repair of UPS/Inverter. They will be able to list tools and equipment used for installing and repairing UPS/Inverter.

### Ask

- Ask the participants that what they understand by the term electronics.
- Ask the participants if they know about the utility of UPS and inverter.

### Notes for Facilitation

- Make the session interactive by involving the participants in a discussion and introduce the topics to them.
- You could ask the participants about the expectations from the course. Then, inform them briefly about the major topics that will be covered in this course.
- Invite the participants to share their expectations on the whiteboard/blackboard.
- Give the participants a brief overview of what all will be covered in the course.

## Icebreaker

### Objective

The objective of this activity is to make the participants familiar with each other. This is mainly done to break the ice between the participants (make them talk to each other).

### Do

- Make two teams and in the first team, you may have all the participants whose names' first alphabet falls between A to M and the other team having the remaining participants. This strategy may change if you feel one team has more members than the other.
- Ask the teams to stand in a circle. Both teams together will make one circle, standing neither too close nor too far.

### Notes for Facilitation

- Ask the participants to call out their names along with the name of any electrical, electronic or mechanical device or any tools which they remember or might have used in the past, at home or at work.
- The thumb rule of the game should be that the electrical, electronic or mechanical device they will name has to start with the same alphabet as that of their name. For example, if a participant's name starts with A, say Akash, then A for Akash and A for Ammeter can be said or if the name begins with P, say Pawan, then P for Pawan and P for Plier can be given. You can give more examples to them.
- It is an active icebreaker which quickly familiarises the participants with each other's names and brings a feeling of a team. It is also fun to recall the names of tools that they are soon going to use in the course.

## UNIT 1.1: Basics of Electronics and Electronic Components

### Unit Objectives

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

- Define basic electronics
- List electronic components

### Do

- Carry some basic electronic components such as resistor, capacitor, inductor, solenoid, diodes and so on.

### Ask

- Enquire, if they know the basic difference between breadboard and PCB. If you get relevant answers, ask them to list some differences.
- Show them the electronic components you are carrying and ask them to identify them. Further ask them to classify the components as active or passive.
- Ask them to tell what they know about electronic circuit.
- In addition, ask them if they can list the different types of electronic circuits. If you get relevant answers, then ask them the basic building blocks of analog and digital circuit.

### Notes for Facilitation

- Tell the participants that electronics is the branch of science where electrical energy is controlled electrically, through the flow of electrons.
- Inform them that in an electronic circuit, electronic components are embedded on printed circuit boards (PCBs). The circuits are initially build and tested on a breadboard before getting embedded on a PCB.
- In addition, explain to them the difference between PCB and breadboard with the help of the following table:

PCB	Breadboard
It is used for creating temporary prototypes and experimenting with circuit design.	It is used for creating permanent prototypes and circuit design.
No soldering of components is required.	Components need to be soldered.

Can be reused for making different circuits.	Cannot be reused again.
--	-------------------------

Fig 1.1.1 Difference between PCB and broadband

- Further tell them that there are two types of electronic components which are as follows:
  - Active Component
    - Passive Component
- Then explain to them about active components using the following points:
  - Those components which generate energy in the form of voltage or current are called active components. If we take a simple real example of an active component then it would be sun, which has its own light and energy.
  - In very simple words, we can say that active components are energy donors.
  - Brief them about each component along with its application with the help of the following table:

Components	Application
<b>Integrated Circuit (IC)</b>	<ul style="list-style-type: none"> <li>• Oscillator</li> <li>• Amplifier</li> <li>• Timer</li> <li>• Counter, a microprocessor or computer memory</li> </ul>
<b>Transistors</b>	<ul style="list-style-type: none"> <li>• Amplifier</li> <li>• Switch</li> </ul>
<b>Power Sources</b>	<ul style="list-style-type: none"> <li>• Provides energy (power) to the circuit</li> </ul>
<b>Light Emitting Diode (LED)</b>	<ul style="list-style-type: none"> <li>• Aviation lighting</li> <li>• Automotive headlamps</li> <li>• General lighting</li> <li>• Traffic signals</li> <li>• Camera flashes</li> <li>• Lighted wallpaper</li> </ul>
<b>Solenoid</b>	<ul style="list-style-type: none"> <li>• Automotive: interlock device</li> <li>• Medical: dialysis machines, dosing equipment and blood pressure monitoring devices</li> <li>• Railways: locomotives, rolling stock, tracks, signals and power distribution</li> <li>• Industrial: locking, cutting, clamping, punching,</li> </ul>

positioning, diverting, holding  
or rotating

*Fig 1.1.2 Component and application*

- Next, explain to the participants about passive components using the following points:
  - Passive components are those components which do not require any power source to perform their specific functions.
  - These components are not capable of controlling current.
  - Brief them about each component along with its application with the help of the following table:

Components	Application
<b>Transformer</b>	<ul style="list-style-type: none"> <li>• Increase (or step-up) voltage</li> <li>• Decrease (or step-down) the supply voltage</li> <li>• Radio demodulation</li> <li>• Power conversion</li> <li>• Over-voltage protection</li> <li>• Logic gates</li> <li>• Waveform clipper and clamper</li> </ul>
<b>Resistor</b>	<ul style="list-style-type: none"> <li>• In a low-noise amplifier or a pre-amplifier</li> <li>• In heavy-duty industrial high-current</li> </ul>
<b>Capacitor</b>	<ul style="list-style-type: none"> <li>• Energy storage</li> <li>• Digital memory</li> <li>• Pulsed power and weapons</li> <li>• Power conditioning</li> </ul>
<b>Inductors</b>	<ul style="list-style-type: none"> <li>• Energy storage</li> <li>• Analog circuits and signal processing</li> </ul>

*Fig 1.1.3 Passive components and application*

- Tell the participants that an electronic circuit is a combination of electronic components that are connected to provide flow of current.
- Inform them that there are two types of electronic circuits i.e. analog and digital.



Then explain to them about analog circuits with the help of the following points:

In these circuits, there is continuous variation of voltage or current with time according to the information required to be represented.

The circuit is a combination of basic components such as resistors, capacitors, diodes, inductors, transistors.

Analog circuit analysis employs Kirchhoff's circuit laws.

The fundamental building blocks of analog circuits are series and parallel circuits.

The magnitude of current is same through all the components connected in a series circuit.

The magnitude of voltage is same through all the components connected in a parallel circuit and the current is divided among the various components.

*Fig 1.1.4 Analogue circuits*

- Further explain to them about digital circuits with the help of the following points:

A binary scheme is used by digital circuits for digital signalling.

Two different voltages (high or low) are represented by different logic levels i.e. high voltage which is generally 5V, represents one value and the other value represents low voltage which is generally 0V.

The basic building blocks of digital circuits are logic gates, microprocessor/Chip and microcontroller.

Digital circuits can provide both logic and memory, enabling them to perform arbitrary computational functions.

Digital circuitry is used in creating general purpose computing chips, such as microprocessors and custom-designed logic circuits.

*Fig 1.1.5 Digital circuits*

- In addition, inform them that apart from analog and digital circuits there is a third type of electronic circuit which is known as mixed-signal circuits. Mixed-signal contains elements of both analog and digital circuits.
- Further explain to them the difference between analog and digital circuits with the help of the following table:

<b>Analog Circuit</b>	<b>Digital Circuit</b>
In these circuits, there is continuous variation of voltage or current with time according to the information required to be represented.	A binary scheme is used by digital circuits for digital signalling.
Analog circuits are difficult to design as the components have to be placed manually, because automation techniques for designing these circuits are not much efficient.	Digital circuits are easy to design because automation technique can easily be implemented at various levels of circuit design and thus involve minimal human effort.
As the input signal is analog, so no conversion of input signals is required before processing.	The input signals need to be converted from analog to digital form before it gets further processed
There is minimum or no loss of information.	Some amount of information is lost due to the conversion process at the input.
Analog circuits are less flexible.	Digital circuits have high degree of flexibility.

*Fig 1.1.6 Analogue Vs. digital circuits*

- Finally explain to them some basic electronic circuits such as, alternating current (AC) circuits, current transformer circuit and circuits with switch.
- Explain to them the working of current transformer in detail:
  - The current transformer steps down the high voltage current and provides safe monitoring of the actual current flowing in the circuit. The primary winding in a current transformer, consists of only one or very few turns. This winding is a coil of heavy duty wire wrapped around the core or just a conductor or bus bar placed through a central hole. The primary winding is in series with current carrying conductor supplying a load. The secondary winding may have a large number of coil turns wound on a laminated core of low-loss magnetic material. The secondary winding supplies current into either a short circuit, in the form of an ammeter, or into a resistive load. The supply to the secondary winding is maintained till the high voltage fed does not saturate the core or a failure occurs due to voltage breakdown.

## UNIT 1.2: Fundamentals of Electricity

### Unit Objectives

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

- Define Ohm's law and Kirchhoff's law
- Explain electrical polarity, AC, direct current (DC) and serial and parallel circuit
- Describe electric energy consumption

### Say

- Electricity is a natural force that comes into existence whenever there is a flow of electric charge between any two components.
- The flow of electric charge is called current.
- Voltage is the potential difference between a negatively charged component and a component with positive charge.

### Ask

- Ask the participants if they know what current and voltage are.
- Then, ask them if they know some laws related to current and voltages.
- In addition, ask them if they know the difference between AC and DC current.

### Notes for Facilitation

- Explain to the participants, the Ohm's law. Then tell them about the linear relation of current and voltage with the help of the following graph, where X axis represents current and Y axis represents voltage.

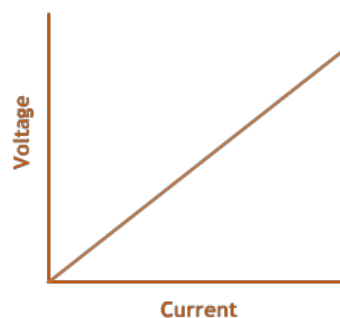


Fig 1.2.1 Ohm's law

- In addition, tell the formula  $V = I R$ , where  $V$  is the voltage across the device,  $I$  is the current flowing through the device,  $R$  is a constant and known as resistance which depends upon the material from which the device is constructed.
- Now that they have learned the relationship between current and voltage, ask to them solve a simple numerical based on Ohm's law:
  - If 0.5A current is flowing through a 5-ohm resistor. Calculate the voltage of two points of resistor.
  - Solution:  $V=IR$   
 $V = 0.5 \times 5 = 2.5V$
- Then explain to them, the Kirchoff's Law.
- Further explain to them about electrical polarity. Tell them that electrical polarity (positive and negative) is used to describe the direction of current flow in a circuit.
- Inform them that in the diagram in the handbook also, current has been shown flowing from the positive terminal to the negative terminal as shown in the following figure:

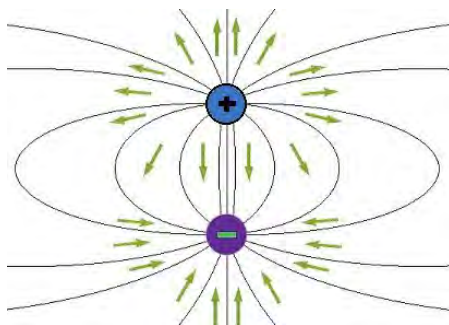


Fig 1.2.2 Positive and negative terminal

- Tell them the difference between AC and DC with the help of the following table:

Parameter	AC	DC
<b>Direction</b>	It reverses its direction while flowing in a circuit.	It flows in one direction in the circuit.
<b>Current</b>	It is the current of magnitude varying with time	It is the current of constant magnitude.
<b>Obtained from</b>	A.C Generator and mains.	Cell or Battery.
<b>Passive Parameters</b>	Impedance	Resistance
<b>Power Factor</b>	Between 0 and 1	It is always 1
<b>Types</b>	Sinusoidal, Trapezoidal, Triangular, Square	Pure and pulsating

Fig 1.2.3 AC and DC differentiation

- In addition, tell them in a direct current circuit, current flows in a single direction and one pole is always negative and the other pole is always positive. In an alternating current circuit, the two poles alternate between negative and positive and the direction of the current (electron flow) reverses periodically.
- Further explain to them series and parallel circuits.
- Inform them that in a parallel circuit all the components have the same voltage across them, for example household wiring, so that if any point of the circuit gets damaged, only that part needs to be replaced.
- Lastly explain to them the difference between series and parallel circuit with the help of following table:

<b>Series Circuit</b>	<b>Parallel Circuit</b>
All components share the same current	Components have the same potential difference between them
There are no junctions between components	A loop can be found between two components
If the circuit breaks at any point, current stops flowing through the circuit altogether	If one branch of the circuit breaks, all the other branches can still function

*Fig 1.2.4 Series and parallel circuit*

## UNIT 1.3: Introduction to UPS and Inverter

### Unit Objectives

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

- Define UPS and inverter along with their types
- Explain the functionalities and parts of UPS and inverter
- Select the UPS and inverter as per given specifications
- Identify the application of UPS and inverter
- Explain the basic differences and similarities between UPS and inverter

### Ask

- Ask the participants if they know anything about UPS and inverter.
- If yes, ask them to tell the full form of UPS.
- Ask them whether they have Inverter at their homes?
- Ask them the functionality of an inverter

### Notes for Facilitation

- Start the session by explaining to the participants the importance of power protection with the help of the following points:
  - To prevent downtime: Downtime is the period when your machine/equipment is not working. In order to prevent this period, power protection is important. For example, if you own a small printing press, it is necessary that your machines should continuously work and there should be no power disruption. If there is a power disruption, then that time period will be the downtime and it should be prevented by using suitable power supplies.
  - To prevent equipment/machine damage: Power protection is not limited to continuity of power, but it is also about protecting the equipment/machine from damage. Many times when there is sudden power cut, it could be accompanied by a short but powerful surge in electricity that can disrupt or damage electronic systems.
  - To prevent data loss: Data loss can be the biggest cost from a large power outage, and can sometimes damage the servers also. So it is important to protect the data loss.
- Further explain to them that there are many devices available for providing protected power solution such as UPS, electronic generators and inverter. Then introduce them to UPS. Tell them that a UPS (uninterruptable power source/supply) is also known as a flywheel/battery backup. It is an electrical device which provides back up power to any load if the mains or power source fails. An emergency or auxiliary power system or a standby generator varies from a UPS in a way that it provides an instant power backup. This power backup is enough to start the auxiliary power system or standby generator.

- Next explain to them the block diagram of UPS with the help of the following points:
  - There is no link between Mains AC Supply and Load in ON line UPS.
  - The load gets power supply from Inverter whether the mains supply is ON or OFF.
  - In this type of UPS, the Inverter works continuously, therefore this type of UPS is also called Continuous mode UPS.
- Further tell them the functionalities of UPS.
- In addition, brief them about the parts of the UPS with the help of the following points:

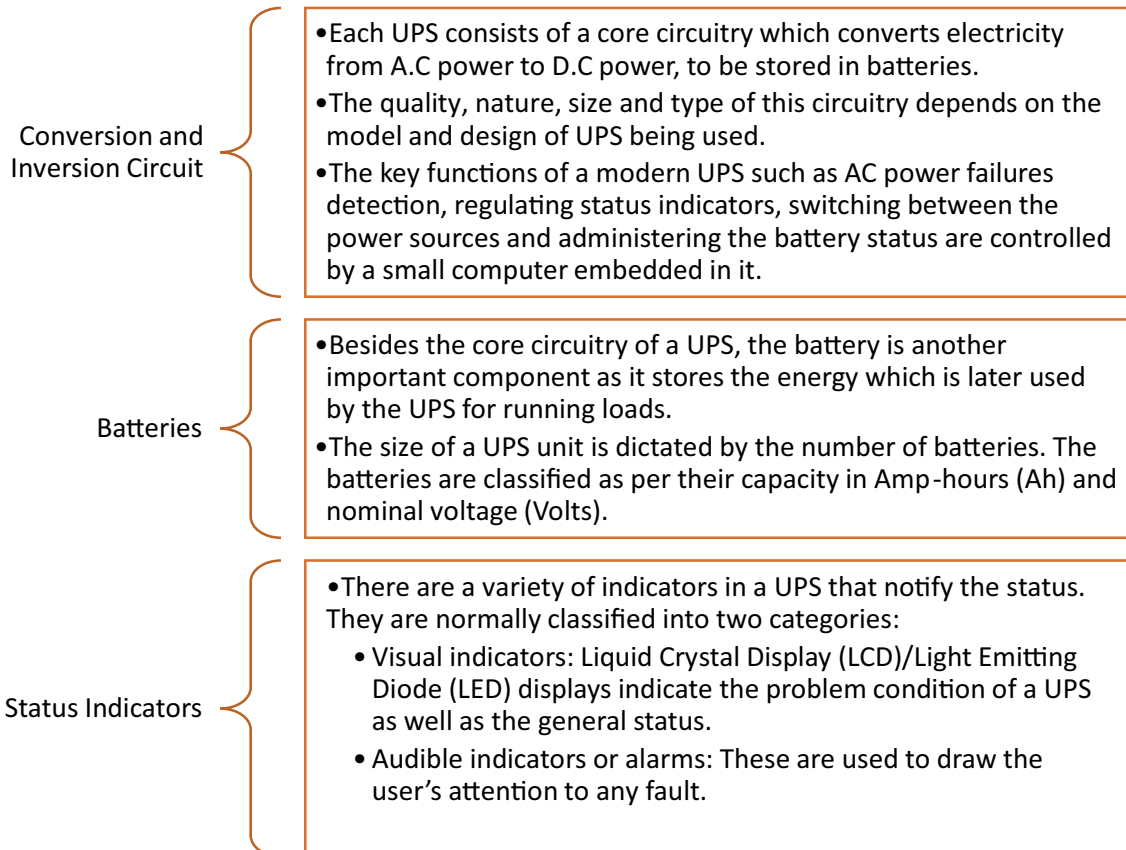


Fig 1.3.1 Parts of UPS

- Explain to them the importance of testing the load and battery characteristics. In a lead-acid battery there are chemicals between electrodes and electrolytes which are continuously reacting irrespective of the battery being charged or discharged. The charge stored in chemicals, also called as "interface charge", spreads through the process of diffusion to the entire volume of the active material.

When a battery is discharged completely, say a UPS was left on load for the entire night and it did not get power supply, and is given a fast charge for a few minutes, then it develops a charge just near the interface during the short charging period. The voltage in the battery and the charger becomes almost equal and the charging current decreases significantly. After a few hours, this interface charge spreads to the entire volume of the electrode as well as the electrolyte and becomes so low that the UPS does not start.

When this interface charge is done, the UPS self-test functions only for a few seconds and may not accurately reflect the running capacity of a UPS. In order to gauge the maximum running



capacity of a UPS, an extended recalibration or rundown test, which completely discharges the battery, will be required. The deep discharge testing is damaging for the battery, as the chemicals in the discharged battery begin to crystallize and cannot be dissolved completely when the battery is again charged. Hence this reduces the capacity of the battery permanently. In lead-acid battery, this process of reducing the capacity of battery permanently is called as sulfation, but it also effects other types of batteries like nickel cadmium batteries and lithium batteries. Thus, it is recommended that rundown tests should be done between every six months to one-year time period. In commercial UPS, battery cells can be isolated and tested individually in a battery string if they are:

- Multi-kilowatt
- Having large battery banks
- Individual chemical cells wired in a series or combined-cell battery units (12-v lead acid batteries)

Intermediate sensor wire at each cell-to-cell junction can be used to measure the electrical characteristics of individual cells in a battery string. These battery strings can be wired as series parallel in two sets of 20 cells. In such a case, it will be necessary to monitor current flow between parallel strings, as the current may flow between the strings to balance out the cells which maybe weak cells, shortened cells or dead cells with high resistance. Strong strings can get discharged because of weak strings in case of voltage imbalances. All this must be taken into consideration when calculating the individual inter-cell measurement in each string.

- Explain to them the different types of UPS and their benefits.
  - On the basis of design/approach:
    - **Standby:** The benefits of selecting this design is its small size at a low cost with high efficiency.
    - **Line interactive:** It has an additional feature of voltage regulation during the existence of low voltage by adjustment of the transformer taps. Voltage regulation is an important feature when low voltage conditions exist, otherwise the UPS would transfer to battery and then eventually down the load.
    - **Standby-Ferro:** It has a ferro-resonant capability that helps in limited voltage regulation and shaping of the output waveform. The practical power range is 3-15kVA. The isolation from AC power transients provided by the Ferro transformer is very similar to any filter available. The ferro transformer creates severe output voltage distortion which at times is worse than a bad AC connection and are inherently inefficient. These transformers are large in size and heavy as compared to regular isolation transformers. This design generates a lot of heat even though it is standby UPS by design.
    - **Double conversion online:** In double conversion online UPS design, the backup battery that gets charged by the AC input, provides power to inverter. So, when there is input failure, the transfer switch need not to be activated and it makes the transfer time nil. If there is an input failure, the transfer switch need not be activated and it makes the transfer time nil.
    - **Delta conversion online:** This provides the same output as double conversion though the inputs may differ. This type of inverter does not use the filter banks as in case of a typical solution and gives dynamically controlled power factor corrected

input. This input ensures a compact solution, compatibility with all generator sets thus reducing the wiring needs and large size of generators. In addition, this design also reduces the energy losses. In steady conditions, this design allows the UPS to deliver power to the load with high efficiency as compared to double conversion design.

**NOTE:** Delta Conversion On-Line technology is the only core UPS technology today protected by patents and is therefore not likely to be available from a broad range of UPS suppliers.

- Also compare the different types of UPS on the basis of their advantages and disadvantages with the help of the following table:

Type of UPS	Advantages	Disadvantages
Standby	Low cost, High efficiency, Compact	Uses battery during breakdown, Impractical over 2kVA
Line Interactive	High reliability, High efficiency, Good voltage conditioning	Impractical over 5kVA
Standby Ferro	Excellent voltage conditioning, High reliability	Low efficiency, Unstable in combination with some loads and generators
Double Conversion On-Line	Excellent voltage conditioning, Ease of paralleling	Low efficiency, Expensive under 5kVA
Delta Conversion On-Line	Excellent voltage conditioning, High efficiency	Impractical under 5kVA

Fig 1.3.2 UPS types, advantages and disadvantages

After explaining different types of UPS based on their design, compare the design approaches and their advantages and disadvantages. Single-conversion UPS systems provide less protection as compared to the double-conversion UPS systems but they are more efficient. Hence, they are more suitable with loads having high tolerance for failure. This is also the reason why standby UPS, the most common type of single conversion UPS is used for smaller applications, like desktop and point-of-sale solutions whereas the line-interactive UPS are used for small server, storage and network applications in small offices. Double-conversion UPS system provides the maximum levels of protection though they are less efficient. Hence, they are used in protecting critical systems like operation theatre equipment's in hospitals. Multi-mode UPS system are very expensive but they are best suited for places/application requiring an optimum efficiency and protection.

- On the basis of the form factor:
  - **Tower model:** These models stand upright on the ground, desk or a shelf.
  - **Rack-mount model:** These models are mounted in standard nineteen-inch rack enclosures and need 1U to 12U rack space.

- Explain to them the considerations for choosing the right UPS. In addition, also tell them the considerations for selecting the UPS from a customer point of view as shown in the following figure:

Type of equipment	<ul style="list-style-type: none"> <li>• Which equipment has to be connected with the UPS such as a personal computer or a server, network or a data centre</li> </ul>
Power consumption	<ul style="list-style-type: none"> <li>• Total consumption of electricity which will be required by all the equipment connected. Thumb rule is to have UPS 25% higher than the total power needed.</li> </ul>
Backup runtime	<ul style="list-style-type: none"> <li>• Power rating to identify the runtime provided</li> </ul>
Type of UPS	<ul style="list-style-type: none"> <li>• Depending upon requirement of energy efficiency and protection requirement choose from single conversion, double conversion and multi-mode.</li> </ul>
Place of installation	<ul style="list-style-type: none"> <li>• Depending upon the power requirement, install tower UPS if it is for desktop computers and rack-mount UPS if it is for servers and networks.</li> </ul>
Service and warranty	<ul style="list-style-type: none"> <li>• Kind of service and warranty provided. With proper care and maintenance, the UPS can work trouble free for many years.</li> </ul>

*Fig 1.3.3 UPS from customer point*

- Further introduce them to the concept of inverter. Tell them that it is an electronic device or an electronic circuit that converts DC into AC.
- Then explain to them the block diagram of Inverter by telling them that the battery supply is given to the metal–oxide–semiconductor field-effect transistor (MOSFET) driver where it will convert DC to AC and the resulting AC is given to the step up transformer . The step up transformer will give the original voltage.
- Next, tell them the functionalities of inverter and its classification.
- Explain to them the considerations for selecting the right Inverter with the help of the following points:
  - **Application Environment:** It defines the location or place where the Inverter is to be used, for example for use in office buildings, homes and recreational vehicles
  - **Electrical Standards:** The input voltage of the Inverter must conform to that of the electrical system and battery.
  - **Safety Certification:** It is mandatory that an Inverter should be certified by an independent testing laboratory and should have a stamp of that laboratory.
  - **Power Capacity:** It defines the amount of load and the quality of power an inverter can handle. There are three levels of power rating:
    - a continuous rating

- a limited-time rating
- a surge rating
- **Efficiency:** Efficiency is the ratio of the output power to the input power, and is given as a percentage. It is not possible for any device to convert power without losing some of it and in case of inverters power is lost in the form of heat.
- **Internal Protection:** Sensitive components of inverter should be protected against sudden surges such as lightning, static or even surges bouncing back from overloaded motors.
- **Inductive Loads and Surge Capacity:** Inductive loads absorb the wave's energy with a delay of sometime. Some equipment such as well pumps, washing machines and refrigerators operate on inductive loads. So it is important to check whether an inverter can efficiently feed an inductive load or not because if the Inverter fails in feeding these loads, it may simply shut down instead of starting the device. Also an inverter with marginal surge capacity will dip during the surge, which can cause dimming of the lights and sometimes crash of some equipment/devices. So it is important to correctly identify the inductive loads and surge capacity of an inverter.
- **Low Switching Frequency vs. High Switching Frequency:** A low switching frequency inverter is big, heavy and more expensive but it has high surge capacity. On the other hand a high switching frequency inverter is much smaller, lighter and less expensive but it has low surge capacity.
- Next explain to them the similarities and differences between UPS and inverter. It is very important to tell the participant that why the term UPS and Inverter nowadays are used interchangeably and how technology has minimized the difference between the two.
- Lastly explain to them about the communication interface of UPS and inverter. In addition, inform them that there may be instances when several protected devices can communicate with a single UPS having a large capacity. A single replication device can be used for a USB control or traditional serial. For example, a single replication device allows five computers to connect with a single UPS with the help of USB or serial connections. However, to provide a notification on status, the split of current is unidirectional from the UPS to devices. Only one protected system is permitted to return control signals to the UPS.

## UNIT 1.4: Tools and Equipment

### Unit Objectives

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

- List tools used for installing and repairing UPS/Inverter
- Identify the equipment used for installing and repairing UPS/Inverter

### Ask

- Ask the participants to name some tools they remember.
- Ask them if they can tell the names of the equipment that are used to calculate current, voltage and resistance across the conductors.

### Notes for Facilitation

- Show the participants different types of tools and equipment.
- Explain to them the usage of each tool and equipment.
- Further inform them that troubleshooting is the process of locating faults or trouble in a circuit. In addition, explain to them how the instruments can be used for troubleshooting with the help of the following points:
  - **Oscilloscope:** It is a type of electronic test instrument that allows observation of constantly varying signal voltages, usually as a two-dimensional plot of one or more signals as a function of time.
  - **Ammeter:** It is connected in parallel with various switched resistors and this extends the range of currents that can be measured.
  - **Voltmeter:** Its terminals must be in parallel with the voltage being measured. Voltmeters have a large resistance, so that they only have a small effect on the voltage.
  - **Multimeter:** It measures all the three quantities i.e. voltage, current and resistance and also includes other features such as a diode tester, which can be used to measure continuity in circuits.
  - **Wattmeter:** It has two voltage coils (pressure coils) and a current coil. The two pressure coils, in series or parallel to each other, change the ranges of the wattmeter.
  - **Megger:** It measures electrical leakage in wire. It is used for verifying the electrical insulation level of any device such as motor, cable and generator winding.
  - **Test Light:** A test light, test lamp, voltage tester, or mains tester is a simple piece of electronic test equipment used to determine the presence or absence of an electric voltage in a piece of equipment under test.
  - **Clamp meter:** It measures the vector sum of the currents flowing in all the conductors passing through a cable or probe, which depends on the phase relationship of the currents.

- Activity handling strategy for the Identification Game:
  - Randomly select any participant to answer the questions.
  - Ask each question from 4-5 participants and reveal the correct answer at the end.
  - Correct answer of the first question is Wattmeter.
  - Correct answer of the second question is Spanner.







**Skill India**  
कौशल भारत-कुशल भारत



सत्यमेव जयते  
GOVERNMENT OF INDIA  
MINISTRY OF SKILL DEVELOPMENT  
& ENTREPRENEURSHIP



N · S · D · C  
National  
Skill Development  
Corporation

Transforming the skill landscape



## 2. Role of a Field Technician – UPS Inverter

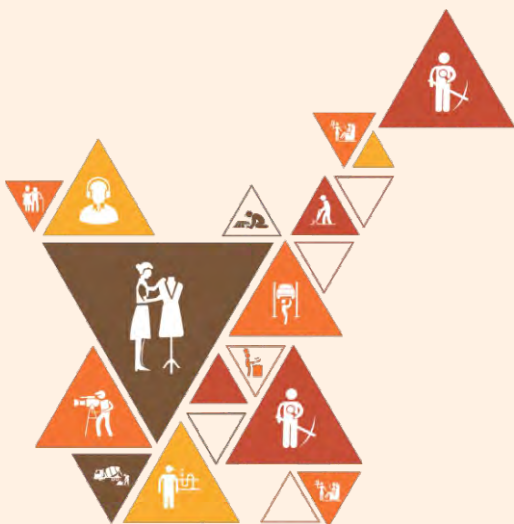
Unit 2.1 – Responsibility of a Field Technician

Unit 2.2 – Understanding the Requirement of Customer

Unit 2.3 – Organizational Context

Unit 2.4 – Health and Safety Norms

Unit 2.5 – Improving Work Process



(ELE/N7201)

## Key Learning Outcomes



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

- Determine the responsibilities of a field technician
- Analyse the customer requirements
- Adhere to the reporting and documentation process
- Follow the health and safety norms
- Identify ways to improve the work process

## UNIT 2.0: Objective of the Module

### Objective of the Module

The objective of this module is to make the participants understand the skills required to work as a field technician. It is important for them to know the responsibilities and the personality traits that are required to perform the job role. They should be able to determine the work requirements of a technician and manage the work as per the given responsibilities. It is also essential that the participants know how to handle customers and their requirements. Moreover, the participants should be aware of the policies and the documentation process which is associated with the job role and the workplace. In the given work conditions, it is important for them to identify ways to improve work processes. It is also essential for them to follow the health and safety norms.

### Ask

- Ask the participants if they know about the work processes which a field technician should follow.
- Ask the participants if they can tell about various levels which they think exists in a company.
- Ask the participants if they are aware of potential occupational hazards and safety risks which can be there at their workplace.
- Ask the participants if they can tell about some of the safety precautions which should be taken by a technician at work.

## UNIT 2.1: Responsibilities of a Field Technician

### Unit Objectives

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

- Describe the responsibilities of a field technician
- Develop personality traits and skills to manage the job

### Ask

- Ask the participants what they know about the job role of a field technician.
- Ask the participants if they can tell about the basics of wiring.
- Ask the participants if they know about the personality traits and skills required for the job of a field technician.

### Say

- Tell the participants that they should have knowledge about the installation and repair of UPS/inverter.
- Tell that they should have knowledge about the basic wiring required to install or repair a UPS /inverter.
- Tell that they should be able to calculate energy consumption to solve customer queries regarding the electricity and wattage consumption.
- Tell the participants that they should know the right way to handle the customers, understand their needs and provide the right service to them as per the company's standards and policies.

### Explain

- Explain to the participants that the basic responsibilities of a field technician are to:
  - Install new UPS/inverter
  - Repair old UPS/inverter
  - Provide maintenance of UPS/inverter
- Explain to the participants that a field technician should understand wiring to install or repair a UPS/inverter. They should know the meaning of different colours of wires and the flow of electricity in them.
- Explain to the participants that the components and equipment that are used must be maintained properly.

- Explain about the importance of communication with the customer to know their requirement.
- A technician should be able to understand the correct requirement in order to give the right kind of service. The complaints or work requirements will flow in from the customer care centre or from the supervisor.
- After a complaint has been lodged, the technician should have clarity about the work, customer location and details of the product's problem before going to visit the customer. There can be a situation when a technician might be able to understand the real problem only after physical examination but it always helps to understand the problem briefly before a visit to the customer. This might save an extra visit which could happen because of incomplete information.
- Explain to the participants about the importance of personal grooming.
- Tell the participants that they represent the company in front of the customer and therefore they should take care of personal grooming.
- Explain to the participants the importance of personal hygiene, for e.g. when they visit the customer their clothes should be neat and tidy. Their hair should be trimmed. They must not smell of sweat as this creates an unhealthy impression in front of the customer.
- Explain to the participants the importance of following workplace etiquette. Workplace etiquette is the accepted social behaviour when we work along with others in a team. It includes the norms as shown in the following figure:



Fig 2.1.1 Norms

## Notes for Facilitation

To facilitate the activity, Group Discussion, on personal grooming:

- Ask the participants to get together in groups and write things related to dos and don'ts to be practiced at a customer's home. Then discuss with all the groups together.
- Do corrections wherever required.

To facilitate the activity, Solve:

- Ask the participants to calculate the answer for the problem given on the activity sheet.

1. The calculation will be as follows:

$$300 \text{ watts} \times 24 \text{ hours} = 7,200 \text{ watt-hours per day}$$

$$7,200 \text{ watt-hours per day} / 1000 = 7.2 \text{ kWh per day}$$

$$7.2 \text{ kWh per day} \times 30 \text{ days} = 216 \text{ kWh per month}$$

$$216 \text{ kWh per month} \times 10 \text{rs per kWh} = \mathbf{2160 \text{ per month}}$$

2. Answer:

- a) Cost = Electrical power x time x cost per kWh

$$= 5 \times 1 \times 9$$

$$= \mathbf{45}$$

- b) Cost = Electrical power x time x cost per kWh

$$= 0.4 \times 14 \times 9$$

$$= \mathbf{50.4}$$

- c) Cost = Electrical power x time x cost per kWh

$$= 4 \times 1200 \times 9$$

$$= \mathbf{43200}$$

## UNIT 2.2: Understand Customer Requirement

### Unit Objectives

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

- Discuss the right way to interact with a customer
- Analyse the customer's requirements

### Ask

- Ask the participants to tell why it is important to understand a customer's requirements.
- Ask the participants about the various things they should enquire from the customer prior to the visit.

### Say

- Tell the participants that the visit to the customer's home can be for a new installation or a repair/ maintenance. They must know the requirement of the customer before the visit.
- Tell the participants that they must always interact politely with the customer. The customer's feedback should always be shared with the supervisor.
- Tell the participants that the technician should offer the most appropriate solution to the customer.
- Tell the participants that there will be various types of customers whom they will meet. Some may be calm and polite while others may be angry and impatient. However, the technician should always be patient and polite. They should not fight with the customer or reply back in the same rude tone as of the customer.
- Tell the participants that in case of a complaint by a customer, the objective should be to understand and diagnose the problem. Ask the customer various questions so that they are able to understand the problem with the UPS/inverter and accordingly carry the equipment and tools which will be required. It is also important that the customer should be convinced about the solution which has been offered.

## UNIT 2.3: Organizational Context

### Unit Objectives

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

- Implement the reporting and documentation process
- Identify the organizational culture and customer profile

### Ask

- Ask the participants to tell what they understand by the term reporting.
- Ask the participants to tell the important etiquette which they should follow while at work.

### Say

- Share a template of a work order such as the one in the following figure and guide the participants in comprehending it.

COMPANY NAME  
XXX, Street no. X  
City, Pin code - XXXXXX  
Phone no: XXXXXXXXXX

**WORK  
ORDER**

Customer Order No. :	Phone:	Order Date:
Order taken by:	Starting Date:	Service:
Bill To:	Signature of Recipient	
Address:		
City-State-Pin Code:		
Job Name/Location:		
Description		
Comments:	Total Material:	
	Total Labour:	
	TAX:	
	Total Due:	
Date completed:		
I hereby acknowledge that work specified above is completed.		Signature

Fig 2.3.1 Template-example

### Explain

- Explain to the participants what organizational context refers to – such as work division/department, work unit and work role.
- Explain to them that they need to be aware of set protocols such as:
  - Follow rules and policies laid down by the company.
  - Follow the structure of reporting.
  - Adhere to the defined role of work.
  - Complete the documentation process.
- Explain the common policies of the company which include the following:



- Reporting and dispersing on time
- Not carrying out illegal activities
- Coordinating with co-workers to effectively complete deliverables
- Follow a proper code of conduct in terms of behaviour and work output delivered
- Explain the importance of filling forms and submitting to the respective person for record keeping. For example:
  - Filling up a form which would include the name of the employee, age, address, contact number, blood group and also a section containing a close aide's name and contact information, who can be contacted in case of an emergency
  - Updating forms or a database to fill invoice details
  - Updating attendance sheet for record keeping
  - Filling up leave application forms for planned leaves
  - Taking customer feedback after giving a service
- Explain to the participants that their work practices should follow the organizational norms and policies. The standards and ethics of working must be adhered to all the time.

## Notes for Facilitation

Culture within an organization is dependent on a number of factors, such as, the approach of the organization towards the quality of service and the vision of the organization. Example NSDC has the mission, “to improve skills and standards in line with international standards, and quality assurance programs to develop the necessary framework”. All employees must adapt to the culture of the company to work in harmony. The following figure shows the various determinants of an organizational culture:



Fig 2.3.2 Organization culture

## UNIT 2.4: Health and Safety Norms

### Unit Objectives

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

- Determine safety issues at work
- Classify health issues at work
- Analyse the preventive measures to be taken

### Ask

- Ask the participants if they can list the steps to be taken in case a fire breaks out.
- Ask them to name the safety gears a technician should use.
- Ask the participants to tell why it is necessary to receive health and safety training.
- Ask them about the common errors which may lead to a mishap.
- Ask the participants to list a few potential hazards.
- Ask them about the basic first aid steps by giving them the following situations:
  - A co-worker faints
  - A co-worker burns his/her finger
  - Someone suffers a bee sting
  - Someone chokes while eating

### Explain

- Explain to the participants the importance of following the health and safety norms. They should follow the safety guidelines at all times.
- Explain to the participants how providing health and safety information helps to ensure that the employees work safely and without risks to their health. For example, it is essential for the workers to understand:
  - The need of wearing safety gears as soon as they commence their work.
  - The importance of maintaining a correct posture while working to avoid health hazards.
  - The basic first aid measures so that they may help a victim.
  - The importance of identifying, reporting and escalating any potential hazard.
  - The basic health guidelines drawn by the company.
  - The need to assess and control risks.
- Tell that effective health and safety training shall help them in being competent during an unforeseen mishap. For example:
  - Electric shocks
  - Falls
  - Burns

- Inhaling any foreign body
- Cuts
- Explain to the participants about Electrostatic Discharge also known as ESD. Tell them how ESD is harmful for sensitive components while assembly of the device, production and shipping. Microchips can be damaged by ESD. To prevent ESD, grounding is crucial. A Human Body Model (HMB) is a model used for testing the vulnerability of electronic equipment to ESD from human contact.
- Talk about the protective gears which are used while handling components prone to ESD – wire strap, gloves and safety apparel worn while working.
- Explain the proper handling of tools, equipment and hazardous materials.
- Explain the importance of using safety gears such as wrist strap, gloves and proper clothing.
- Tell them about the procedures which are required to be followed in case of emergencies.
- Explain to them in detail about providing first aid.
- Explain the importance of maintaining a proper posture while working.

## UNIT 2.5: Improve Work Process

### Unit Objectives

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

- Identify ways to do defect-free work
- Maintain quality and ensure timely completion of work
- Keep work area clean

### Explain

- Explain to the participants how small process improvements can be set up and executed in a short period of time.
- Explain how zero defect in work can be achieved. Tell the participants that zero defects means that there should not be any wastage while working on an existing project.
- Explain that Zero defects theory is based on four fundamentals for successful implementation of projects.
  - Quality means adhering to requirements. Understanding and fulfilling requirements as per instructions and guidelines is an assurance that quality will be achieved.
  - Quality should be taken care of right at the beginning. It is less cumbersome and expensive to prevent defects than to discover and correct them later.
  - Quality is measured in monetary terms. Defects imply hidden costs like wasted material, re-work, labour, customer dissatisfaction and lost revenue.
  - Quality should be maintained according to the zero defects theory. Mistakes are not inevitable. Perfection in work, and not being just good, should be the aim.
- Explain to the participants that anything during the project, which is unproductive and does not add value to it, should immediately be removed.
- Tell them the importance of quality in work and timely delivery.
- Explain the importance of reporting to the supervisor in case of a change in project plans.
- Explain that work done should comply to set standards and regulations of the company.
- Tell the participants that a clean and organized work area will make them feel positive about the work and help them avoid waste of time. Disorganised and haphazard setting might result in damage to the tools and equipment.

### Notes for Facilitation

- To facilitate a discussion, refer to the following questions and encourage the participants to answer:
  - Maintaining a clean work environment

- What should you do if you see a workstation with various equipment scattered on it?
- What should you do if you see some machine oil spilled on the floor?
- What should you do if you see pieces of paper and wire spread all over your table?
- Ensuring timely completion of work
  - What steps should you take to enable yourself to complete your work on time?
  - What are the few non-technical factors which may hamper a delivery?
  - What can be the technical factors responsible for a delay in a delivery?
- Achieving zero defect in work
  - Do you think inappropriate lighting can hamper the quality of work?
  - What would you do if the quality of wires provided to you to connect a control panel is poor?
  - Do you think wearing or not wearing safety gear will make a difference while working on a UPS/inverter?
- To facilitate identification of potential hazard, give the participants an example:
  - Tell them how while working, an employee used to slouch too much while sitting on the chair. Despite the preventive measures, the incorrect posture of working led to severe backache for a long period of time.
  - Further ask the participants to describe any experience they had of spotting a potential hazard related to health and safety.
- Activity handling strategy for Match the following:
  - Draw the given table on the white/black board.
  - Ask any participant randomly, to match the function with its name.
  - Correct answer of the question is as follows:

<b>Names</b>	<b>Function</b>
1. Conduit Box	○ To protect inverter, battery and wiring connections
2. AWG AC Wiring	○ To connect inverter to AC breakers
3. Conduit Bushings	○ To protect the wire ends without damaging the protection coating
4. AWG Ground Wire	○ To protect device from high voltage enabling circuit breaker
5. Rap Straps	○ To hold wires together
6. Bus bar for DC Positive	○ To carry substantial electric currents over relatively short distances
7. Four 4-tab power distribution bus bars	○ To distribute power at short distances
8. 250A 160VDC 3/8" stud DC breaker	○ To protect electrical devices that operate with direct current

- 9. Custom-designed bypass interlock plate
    - To connect generator to electrical system safely without danger of backfeed to utility power
  - 10. One Pair #4/0 AWG battery cables
    - To make battery connections
  - 11. AC Sync Cables
    - To make electrical connections of battery and AC source
- Activity handling strategy for Identification game:
    - Draw/show the given components.
    - Randomly choose any participant to identify and label one or two components.
    - Reveal the correct answer in the last. The correct answer are as follows:



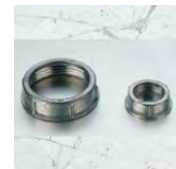
**AWG Ground Wire**



**4-tab power distribution bus bars**



**Custom-designed bypass interlock plate**



**Conduit Bushings**



**250A 160VDC 3/8" stud DC breaker**



**AWG AC Wiring**



**Conduit box**



**Rap Straps**



**AC sync cable**



**AWG battery cables**



**Bus bar for DC positive**

- Activity handling strategy for Discussion:
  - Tell the participants that the objective of the activity is to understand the importance of improving work processes by following certain practices:
    - Maintaining a clean work area
    - Ensuring timely completion of work
    - Achieving defect free work
- Divide into groups of four. Let the participants discuss the case for 20 minutes and come up with solutions for their colleagues. Have a presentation in the room where all the groups should individually present the case.
- Activity handling strategy for Identification game:
  - Tick the actions which can prove to be a threat to the health and safety of a technician. Following are the actions which can prove to be threat to the health and safety of a technician:
    - Smoking near combustible substances
    - Oil spill near customer interaction area
    - Tools lying on the floor
    - Entering a 'No Entry' zone at customer site
    - Touching an ungrounded inverter
    - Walking on a wet floor







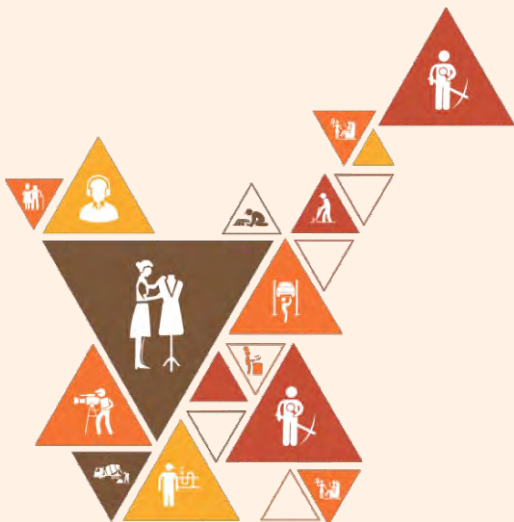
**Skill India**  
कौशल भारत-कुशल भारत



# 3. Working with UPS/Inverter

Unit 3.1 - Install the UPS/Inverter

Unit 3.2 - Repair Dysfunctional UPS/Inverter



(ELE/N7202)

## Key Learning Outcomes



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

- Identify the installation process of UPS/Inverter
- Identify the faults and repair the faulty modules of UPS/Inverter

## Unit 3.0: Objective of the Module

### Objective of the Module

The objective of this module is to make the participants understand the installation process of a UPS/Inverter. They will be able to install the UPS/inverter as per set standards. They will also be able to recognize the faults and repair the faulty units.

## UNIT 3.1: Install the UPS/Inverter

### Unit Objectives

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

- Identify the pre installation steps for installing UPS/Inverter
- Install the UPS/Inverter

### Resources to be Used

- Available objects such as a duster, pen, notebook

### Do

- Draw the following diagram on the whiteboard and explain the steps to be done before, during and after the installation of UPS/inverter.

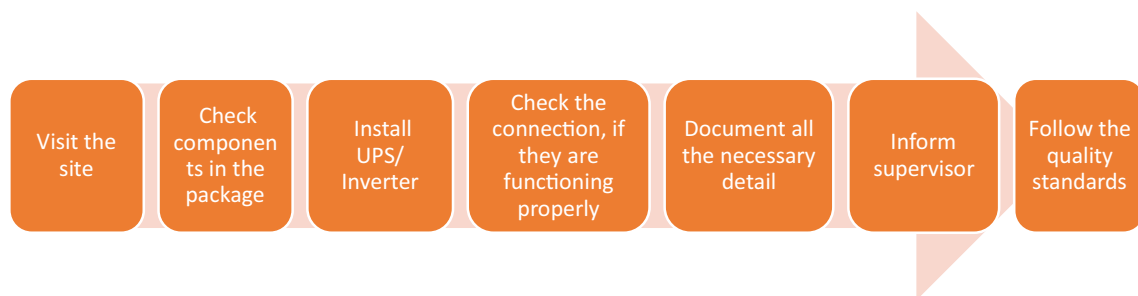


Fig 3.1.1 Installation of UPS inverter

### Say

- Tell the participants that the following points should be checked before installing the UPS/inverter on the site:
  - Installation site is not near any flammable substance
  - The site is not near heated area/outlets
  - The site is not installed near the water outlets
  - It should be placed in an accessible area
- Tell the participants that they should be fully prepared with tools, equipment and manual for the installation process.
- Tell the participants that pre-installation includes:
  - Inspection of site

- To check if it is appropriate for installation.
- To check if the socket is within reach of the UPS/Inverter.
- Preparation of site
  - Check whether mounting is required before installation.
  - Check whether the site is water proof or not.

## Explain



- Explain that during a site visit for installation the following should be ensured:
  - Before installation ask the client for the appliances which will be connected to the UPS/inverter to understand the load.
  - Power supply layout should be inspected for the connection to the various rooms.
  - Thorough check for any flammable substance or water source near the installation site should be done.
- Explain to the participants the use of manual. Tell them that all products come with a manual, which helps to acquaint a person about its:
  - Working
  - Handling
  - Safety measures
  - Usage

## Do



- Draw the following diagram on the whiteboard and explain the steps for unpacking the UPS/inverter for installation.

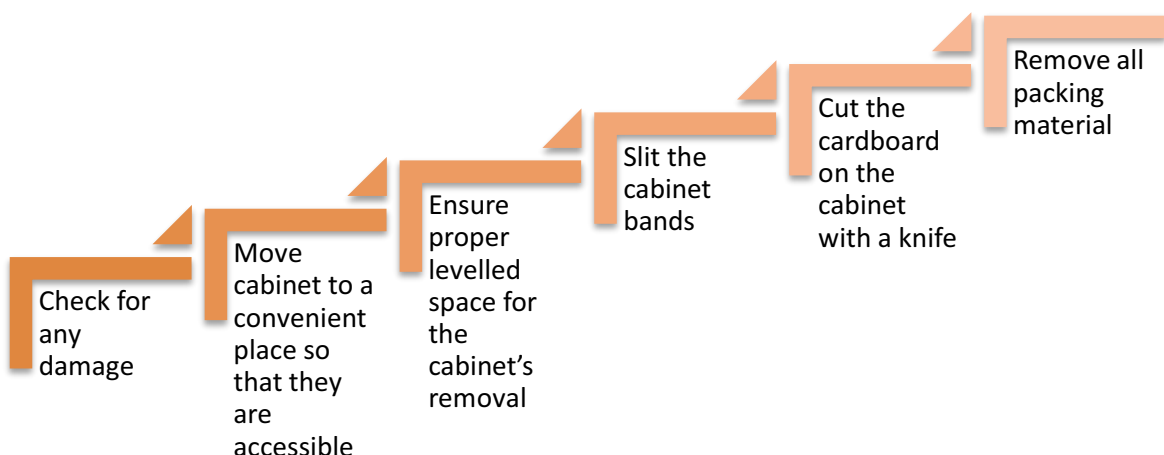


Fig 3.1.2 Unpacking and installation of UPS inverter

## Explain



- Explain the method of unpacking and checking of the modules/components inside the package.
- Explain that following are the standard procedures to unpack and check the components in the package:
  - Know which tool to be used to unpack UPS/inverter.
  - Check if the packages sent are in a good condition.
  - Validate the delivery checklist with the package.

## Say



- Tell the participants about the process and tools used for wiring the UPS/inverter.
- Tell the participants that while installing the UPS following points should be taken care of:
  - During installation the UPS or other cabinets should not be tilted more than  $\pm 10^\circ$
  - Remove the conduit landing plates, add conduit landing holes
  - Hex key tool should be used to attach wires to the terminals
  - Place the perforated floor tiles in front of UPS for ventilation
- Tell the participants, once the UPS/inverter is installed, they should check the functioning of the product and ensure it is working properly.
- Tell the participants that they should always complete the documentation after the installation and verification is done and report to the supervisor.
- Tell the participants to perform all the tasks with efficiency, they should:
  - Plan beforehand for the task to be done.
  - Organize all the tools and documentation required as per specification.
  - Manage the time according to the task to be performed.
  - Perform all the tasks as per company standards.
  - Keep the environment clean.
- Tell the participants to ensure that:
  - There is fast productivity
  - There should be good quality in work

## Activity



- **Activity 1**
  - Time required: 10 minutes
  - Following components will be required to perform this activity:
    - Three pin AC plug
    - AC power cable (Three wires)
    - Screwdriver

- Wire stripper
- Multimeter
- **Suggested Solution**
  - Take the AC power cable and strip the two ends using wire stripper and take off 3 centimetre (approx.) of the plastic covering, leaving the 3 inner cables.
  - Take the plug and remove screws from it by using screw driver.
  - Remove the back off from the plug.
  - Separate all the 3 inside wires and strip off their ends about 1 cm using stripper to make copper wires visible.
  - Place the thick wire on the cable grip and secure the grip using screwdriver.
  - Loosen the screws from the metallic pins for holding the copper wires using screwdriver.
  - Hold the plug as the three pins are facing away.
  - Insert the neutral wire (in blue colour) into the bottom left pin of the plug.
  - Insert the live wire (in brown colour) into the bottom right pin of the plug.
  - Insert the earth wire (in green or yellow colour) in the middle pin of the plug.
  - Fasten the screws to secure the copper wirings.
  - Put the back panel in position and secure it with screw.
  - Adjust the multimeter in continuity testing mode.
  - Check the continuity of the cable by touching the probes to the two ends of the cable.
  - Then check the pins of the AC plug by touching the probes at respective pins.
  - If the multimeter beeps then the connection made or the cable is short else the cable and plug connection is ready to use.
- **Activity 2**
  - Time required: 10 minutes
  - Following components will be required to perform this activity:
    - Voltmeter
    - Power probe
    - Battery
  - **Suggested Solution**
    - Remove the power cables from the battery to make it safe for making.
    - Remove the covering from the terminals of the battery.
    - Attach the positive probe of the voltmeter to the positive terminal of the battery.
    - Attach the negative probe of the voltmeter to the negative terminal of the battery.
    - Check the voltmeter reading in volts.
    - Connect the positive lead of the power probe to the battery's positive terminal.
    - Attach the negative probe of the power probe to the negative terminal of the battery.
    - Note down the reading of the battery in volts.

- **Activity 3**

- Time required: 15 minutes
- Following components will be required to perform this activity:
  - Three 120 volt batteries
  - Jumper cables (blue and black)
  - Wrench
  - 800 Watt inverter
- **Suggested Solution**
  - Place the batteries on a platform making all the respective positive and negative terminal aligned in same direction.
  - Connect the jumper wires (Red colour) to the respective negative terminals of the batteries safely.
  - Connect the jumper wires (Black colour) to the respective positive terminals of the batteries safely.
  - Place the inverter unit near the batteries to make wire connections.
  - Connect the positive terminal of inverter to positive terminal of battery, then connect the negative terminal of inverter to negative terminal of battery.
  - Tighten the nuts using wrench.
  - Put the lids on the batteries.
  - Plug in the AC outlet.
  - Turn the power on to run the inverter.

- **Activity 4**

- Time required: 10 minutes
- Following components will be required to perform this activity:
  - Solar Con panel (12V-24V Su-Kam)
  - Solar panel
  - 1000 VA inverter
  - Battery
  - Wrench
  - Screws
- **Suggested Solution**
  - Place the battery and inverter in the required location.
  - Mount the Solar con and solar panel box on the wall with the help of screws.
  - Connect the negative terminal of ordinary inverter and Solar con with the negative terminal of battery.
  - Connect the positive terminal of ordinary inverter and Solar con with the positive terminal of battery.
  - Tighten the nuts using the wrench.
  - Connect the mains of inverter to inverter mains of solar con.
  - Connect the positive and negative terminal of solar panel to solar con terminals.



- **Activity 5**

- Time required: 10 minutes
- Following components will be required to perform this activity:
  - 800-watt battery
  - Inverter
  - Wires
  - Live wire
  - Neutral wire
  - Wrench
  - Multimeter
- **Suggested Solution**
  - Place the battery and inverter in the required location.
  - Connect the positive terminal of battery to positive terminal of inverter and negative terminal of battery to negative terminal of inverter.
  - Tighten the nuts using the wrench.
  - Connect the mains of inverter to the switch.
  - Connect the load to inverter.
  - Connect negative terminal and positive terminal of multimeter to check if the voltage of inverter is appropriate as per the given load







## Notes for Facilitation



- Give the participants a brief overview of what all will be covered in the program.
- Start the discussion by inviting the participants to join in.
- Introduce the topic by discussing the tasks to be done before installation.
- Activity handling strategy for the Identification Game:
  - Show the given components and ask question related to them.
  - Randomly choose any participant to identify the correct answer for the given question.
  - Reveal the correct answer at the end. The correct answers are as follows:

**(Answer: a)**



<b>(Answer: b)</b>		
 (a)	 (b)	 (c)
<b>(Answer: b)</b>		
Tubular inverter battery (a)	VRLA/SMF inverter battery (b)	Flat plate inverter battery (c)
<b>(Answer: a)</b>		
 (a)	 (b)	 (c)

## UNIT 3.2: Repair Dysfunctional UPS/Inverter

### Unit Objectives

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

- Identify the faults
- Identify the causes of faults
- Repair the faulty units

### Resources to be Used

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

### Do

- Start the session by discussing about the tools that the participants learnt in the previous unit for the installation or repair process.

### Say

- Tell the participants that they should have proper knowledge about the tools to be used in installation.
- Tell the participants that other than installation of the UPS/Inverter they are also liable for its maintenance.
- Tell the participants that they are responsible for fixing any failure that occurs in the UPS/Inverter after installation

## Do

- Draw the following diagram on the whiteboard and explain the various causes of failure of the UPS/Inverter.

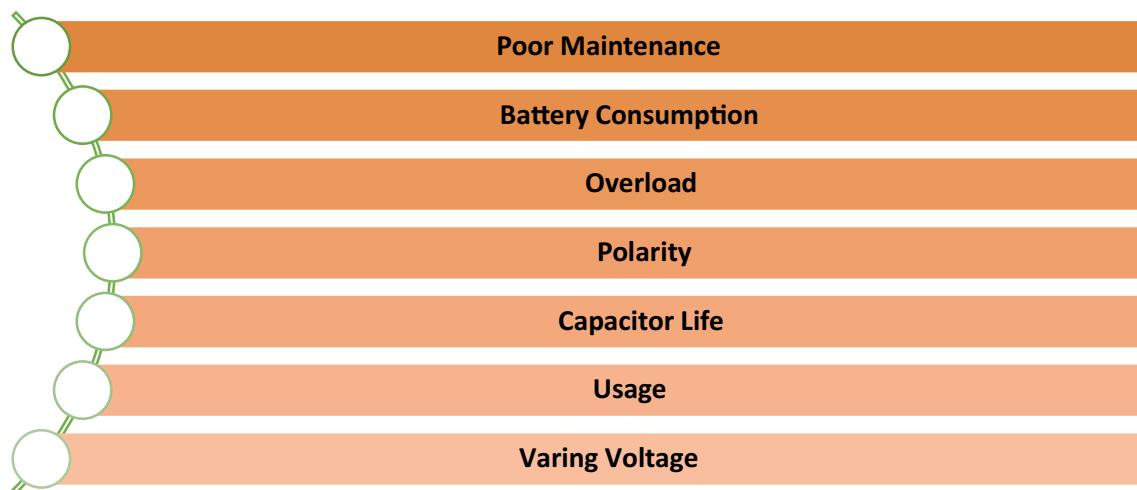


Fig 3.2.1 Failure of UPS inverter

## Explain

- Introduce the topic of common causes of failure of UPS/Inverter.
- Explain to the participants about each cause which could lead to the failure of a UPS/Inverter.
- Explain to the participants about the workflow to fix dysfunctional UPS/Inverter.
- Explain to the participants about volt-ampere test and earth test when “Understand the Symptoms and Identify the Fault” topic is being covered.

## Ask

- Ask the participants if they know about polarity.
- Ask the participants if they know about Capacitor Wear.

## Say

- Tell the participants that UPS/Inverter get affected with various problems resulting in its breakdown.
- Tell the participants that they must know the symptoms of such defaults/problems to stop the UPS/Inverter from becoming completely useless.
- Tell the participants that for identifying few faults they need to perform following tests:
  - Volt-ampere test
    - This test is performed to keep a check on the current drawn and its voltage.

- UPS acquire two types of ratings, volt-ampere and watts, in which the ratings of VA is limited by the maximum permissible current.
  - While performing this test the technician should:
    - ◇ Test across a switch, thermostat, fill valve.
    - ◇ Isolate the item by removing the wires to that item
- Earth test
  - This test is performed to check the ground resistivity, as after some amount of time the ground rods and their connection starts to degrade due to the soils high moisture, high temperature and its salt content.
  - If the resistance is more than 20%, then technician can:
    - ◇ Replace the grounding rods
    - ◇ Add the grounding rods
- Tell the participants about general faults and their remedy:
  - UPS/Inverter not switching on
    - Defective power switch
      - ◇ Repair from service centre
    - Battery terminal not working properly
      - ◇ Clean the terminals
      - ◇ Check if they are tight enough
    - Battery not working properly
      - ◇ Replace faulty/weak battery
      - ◇ Charge discharged battery
  - Issue with battery not getting charged up
    - Dead battery
      - ◇ Replace it
    - Melted fuse
      - ◇ Replace it
    - Burnt rectifiers
      - ◇ Repair from service centre
  - Shortened backup time
    - Battery worn out
      - ◇ Replace battery
    - Electrolyte lose in battery
      - ◇ Refill the lead acid battery with distilled water
    - Overload with power consumption
      - ◇ Cut off extra load
  - UPS/Inverter working on Inverter mode
    - Input is disconnected
      - ◇ Check power cable
    - Melted fuse
      - ◇ Replace it
    - Input is either too high or too low to be accepted
      - ◇ Check input voltage

Do 

- Draw the following diagram on the whiteboard and explain the process of replacing a dysfunctional fuse in the UPS/Inverter.

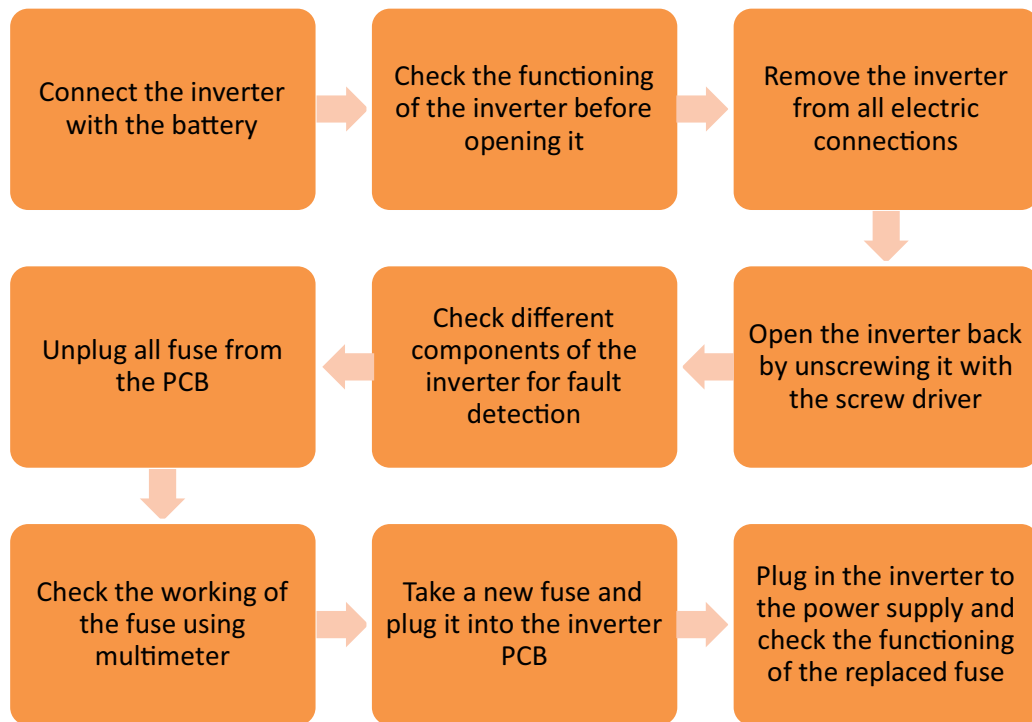


Fig 3.1.2 Dysfunctional fuse of UPS inverter

Explain 

- Explain to the participants about the process followed to replace the fuse of the UPS/Inverter.
- Explain to the participants that regular cleaning of the fan and other components such as battery terminal is required to keep the UPS/Inverter working.
- Explain to the participants that they need to perform testing on the modules once repaired, to check if they are working appropriately.

Example 

- Give an example by mentioning that there is an inverter which is running on inverter mode despite the mains power being turned on.
- Ask them to:
  - First, spend time to recall and understand the cause of this. Can it be:
    - Input disconnection or
    - Melted fuse or

- Varying input
- Second, they should examine the inverter closely and fix the fault if they find the cause.
  - They should make a note of the reason causing the issue.
  - They should write down what care should be taken the next time while installing a new UPS/Inverter.

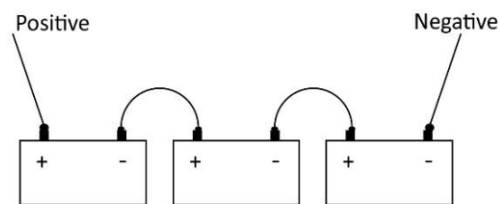
## Do

- Perform the activities that will help the participants to practice the concept which has been studied.

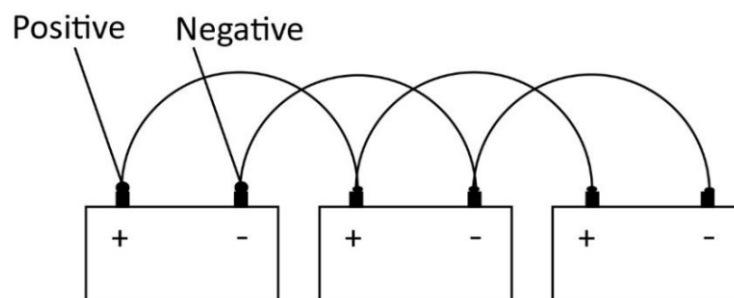
## Activity

### • Activity 1

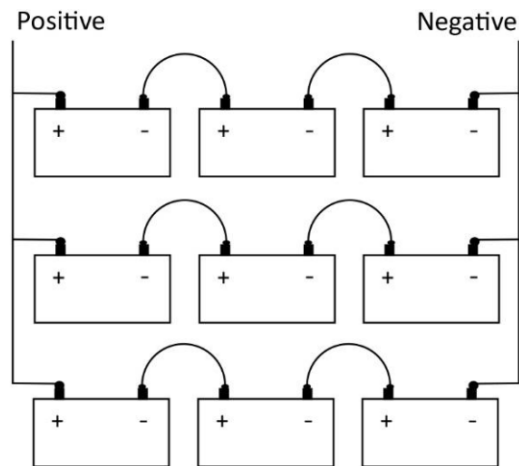
- Time required: 90 minutes
- Following components will be required to perform this activity:
  - Connecting wires
  - Batteries
  - Insulation Tape
  - Wire stripper
- **Suggested Solution**
  - Series



- Parallel



- Series and Parallel combination



- **Activity 2**

- Time required: 60 minutes
- Following components will be required to perform this activity:

- Faulty inverter
- Screw driver set
- Continuity tester
- MOSFET
- Soldering iron
- Soldering wire
- Soldering flux

- **Suggested Solution**

- Check the supply to the circuit.
  - ◇ Replace the power supply
- Check the fuse and ensure its working.
  - ◇ Replace the Fuse
- Check the MOSFET and its working.
  - ◇ Unscrew the control board from the outer heat sink.
  - ◇ Unscrew the MOSFET from the control board.
  - ◇ Unsolder the MOSFET.
  - ◇ Take the new MOSFET.
  - ◇ Solder the new MOSFET to their respective position.
  - ◇ Re-assemble the inverter.

- **Activity 3**

- Time required: 90 minutes
- Following components will be required to perform this activity:

- Faulty Inverter
- Soldering iron
- Soldering wire



- Soldering flux
- Ammeter
- Indicator circuit
- Green LEDs
- Screw driver set
- **Suggested Solution**
  - Check battery current by connecting an ammeter in series with the battery positive.
    - ◇ If the batteries are working fine check the inverter circuits.
    - ◇ If the problem is in batteries, replace the batteries.
  - Unscrew the back of the inverter.
    - ◇ Check the main PCB
      - ❖ Check the PCB using multimeter.
      - ❖ If the PCB is defected replace it.
    - ◇ Check the indicator LEDs using multimeter:
      - ❖ Unsolder the LEDs.
      - ❖ Take new LEDs.
      - ❖ Solder the new LEDs.
    - ◇ Check the indicator circuit:
      - ❖ Unscrew the indicator circuit board.
      - ❖ Unsolder the connecting wires.
      - ❖ Take a new indicator circuit.
      - ❖ Place the indicator circuit in its respective place.
      - ❖ Solder all the connecting cables.
  - Screw the back panel back to the inverter.
  - Connect the power supply to the inverter and check the working.
- **Activity 4**
  - Time required: 90 minutes
  - Following components will be required to perform this activity:
    - UPS
    - Ammeter
    - Voltmeter
    - Battery
  - **Suggested Solution**
    - Connect the UPS to the supply.
    - Check the current and voltage using an ammeter & voltmeter.
      - ◇ Connect an ammeter in series with the battery positive.
      - ◇ Connect a voltmeter in parallel with the battery.
    - If the reading does not meet the load requirement, replace the battery .
- **Activity 5**
  - Time required: 120 minutes
  - Following components will be required to perform this activity:
    - Inverter
    - Screw driver set

- IGBT (HGTG20N60A4D)
- Diodes (MUR860)
- Soldering iron
- Soldering wire
- Soldering flux
- Thermo-conductive grease
- Multimeter
- Spacers
- **Suggested Solution**
  - Unscrew the screws attaching the dissipater to the board.
  - To replace diodes D32, D33 and D34:
    - ◇ Unsolder the rheofores to remove the three secondary diodes
    - ◇ Clean solder from the bump contacts on the board.
    - ◇ Detach the dissipater from the board.
    - ◇ Remove the spring which locks the two diodes.
    - ◇ Clean dirt or any irregularity from the dissipater.
    - ◇ Apply thermo-conductive grease adhering to the standard procedure.
    - ◇ Insert the new diodes between the dissipater and the spring.
    - ◇ Place the dissipater with the new components in the PCB bump contacts and clasp them with the screws.
    - ◇ Solder the terminals.
    - ◇ On the soldering side cut away the protruding part of the rheofores and check that they are not shorted (between cathode and anode).
  - Make sure that the resistor R60 and capacitor C32 on the snubber have not been damaged and are soldered to the PCB correctly
- **Activity 6**
  - Time required: 120 minutes
  - Following components will be required to perform this activity:
    - Inverter
    - Screw driver set
    - IGBT (HGTG20N60A4D)
    - Diodes (MUR860)
    - Soldering iron with stand
    - Soldering wire
    - Soldering flux
    - Thermo-conductive grease
    - Multimeter
    - Spacers
  - **Suggested Solution**
    - Unscrew the screws attaching the dissipater to the board.
    - Primary diode D14 and D32 should also be removed in this process.
    - Remove the two IGBT's Q5, Q8 and the two primary diodes D14, D31 by unsoldering the rheofores.

- Clean the solder from the printed circuit bump contacts.
- Remove the two dissipaters from the board
- Open the screws which lock the two IGBT's.

**NOTE:** Ensure the proper working of components piloting IGBT before making the replacement.

- Use multimeter and ensure that there is no short circuit on the PCB between the 1 and 3 bump contacts (between gate and emitter) corresponding to each component.
- Perform primary test for the resistors.
- Clean dirt or any irregularity from the dissipaters.

**NOTE:** If the IGBT's have burst the dissipaters may have been irreversibly damaged, in this case, they should be replaced.

- Apply thermo-conductive grease adhering to the standard procedure.
- Insert the new IGBT's between the dissipater and the spring.

**NOTE:** Ensure that there is no damage of component during assembly.

- Place the dissipaters with the new IGBT's and primary diodes D14 and D20 in the PCB bump contacts, placing 0 between the dissipater and the PCB (2 for each dissipater) and fasten them down with the screws.

**NOTE:** Make sure there is insulation between the case of diode D20 and the dissipater.

- Solder the terminals.
- Connect the inverter to the power supply and check the functioning.

#### • Activity 7

- Time required: 180 minutes
- Following components will be required to perform this activity:
  - Inverter
  - Dual trace oscilloscope
  - Multimeter
  - Screw driver set
- **Suggested Solution**
  - Preparation for testing
  - Procedure:
    - ◇ Connect the power source to the static load generator using appropriate dinse connector.
    - ◇ Set up the dual trace oscilloscope.
    - ◇ Connecting probe CH1 to the collector on Q8 and probe CH2 to pin 1 on the rheofore of R25.
    - ◇ Connect the earth terminals to the emitter, also of Q8.
    - ◇ Set up the multimeter in DC mode and connect the prods to the OUT+ and OUT- bump contacts.
    - ◇ Connect the power supply cable to the 230Vac power supply.
  - Minimum load test

- Procedure:
  - ◇ Set up the ohmic load with the switch.
  - ◇ On the front panel turn the current potentiometer to minimum.
  - ◇ Main switch should be switched on.
  - ◇ Start up the ohmic load and make sure that the output current is equal to +16Adc 20% and the output voltage is equal to +13Vdc 20%.
  - ◇ The ohmic load needs to be switched off.
- Intermediate load test
- Procedure:
  - ◇ Set up the ohmic load with the switch.
  - ◇ On the front panel turn the current potentiometer to 75A
  - ◇ Main switch should be switched on.
  - ◇ Start up the ohmic load and make sure that output current is equal to +75Adc 10% and the output voltage is equal to +24Vdc 10%.
  - ◇ The ohmic load needs to be switched off.
- Rated load test
- Procedure:
  - ◇ Set up the ohmic load with the switch.
  - ◇ On the front panel turn the current potentiometer to maximum.
  - ◇ Start up the ohmic load and make sure that the output current is equal to +120Adc 5% and the output voltage is equal to +24.8Vdc 5%.
  - ◇ If the output current reading is not 120A  $\pm$ 5%, adjust the current using jumpers JP1, JP2 and JP3
  - ◇ The ohmic load needs to be switched off.
- Testing the secondary diode voltage
  - ◇ Set up the dual trace oscilloscope.
  - ◇ Connect probe CH1 to the anode of diode D33 and probe CH2 to the anode of diode D34.
  - ◇ The earth terminals should be connected together to the secondary dissipater
  - ◇ Remove the multimeter from the OUT+ and OUT- bump contacts
  - ◇ Set up the ohmic load with the switch setting:
    - PROBE CH1 x100
    - 100V/Div
    - PROBE CH2 x10
      - 5V/Div
      - 5 sec/Div
        - ◇ On the front panel turn the current potentiometer to maximum.
        - ◇ Start up the ohmic load and check the waveform displayed on the oscilloscope.
        - ◇ The ohmic load and the main switch needs to be switched off.
- **Activity 8**
  - Time required: 90 minutes
  - Following components will be required to perform this activity:
    - Screw driver set

- **Suggested Solution**

This procedure should be performed annually or whenever batteries need to be replaced.

- Place the batteries in Maintenance Shutdown condition.
- Remove the top and left side panels. Visually inspect the inside of the cabinet for:
  - ◇ Leaking acid.
  - ◇ Corrosion on frame and electrical parts.
  - ◇ Loose or discoloured electrical connections, especially around the cable connections.
- Disconnect the DC+/DC– connector from the left partition of the battery compartment, at the bottom.
- Disconnect the battery trays.
- Remove the vertical support bar (2 screws at top; 2 at bottom) and carefully pull the trays forward, one at a time.

**NOTE:** Care should be taken that the tray doesn't come all the way out.

- Inspect each battery post visually for corrosion or discoloration. If post is discoloured or corroded remove battery cable and clean the post and cable connector shiny bright.
- Replace cable, torque cable connector bolt to the battery manufacturer's recommended torque\*, and apply a generous amount of grease (Dow Corning silicone grease or equal) to the battery posts and connectors.
- If not removed and cleaned, torque all cable connector bolts to battery manufacturers retorque specifications.
- Repeat until all battery trays have been inspected, cleaned and greased. Do one tray at a time and be sure to return tray to its original location. Bolt in place.
- Replace vertical support bar. Reconnect the battery trays to each other. Plug in DC+/DC– connector at lower left partition opening. Replace panel cover.

- **Activity 9**

- Time required: 60 minutes
- Following components will be required to perform this activity:
  - Digital multimeter
  - Battery tester
  - Screw drive set
  - Screw, bolts and nuts
- **Suggested Solution**
  - Perform Maintenance Shutdown procedure.
  - Slide out the desired battery tray onto a lift hand truck.

**NOTE:** The battery tray may weigh in excess of 200 lbs (91 kg). Use lift hand truck to remove it.

- Test each battery separately.

- Using a digital voltmeter which can be read to 0.01 vdc, check the voltage across the posts of the batteries, one at a time. Record the voltage readings for each battery. If the voltage does not read at least 12.40 vdc, the battery probably should be replaced. You may try to recharge the battery, but it probably won't hold a charge. For replacement procedure see Paragraph 4.6.5.
- If the battery's voltage is satisfactory, use the battery tester. Attach the red battery tester cable to the positive (+) battery pole; attach the black cable to the negative (-) battery pole.
- Press the LOAD switch.
- In approximately 10 seconds, the tester needle should be in the good (green) area. If not, the battery should be replaced.
- Perform the same tests on all batteries in the cabinet
- For proper operation, each battery in the cabinet should show voltage readings within 0.10 vdc of their average.
- Return the battery trays to their normal position. When each tray is fully back, replace the two bolts that fasten it to the slide.
- Reconnect the battery tray cables.

- **Activity 10**

- Time required: 60 minutes
- Following components will be required to perform this activity:
  - Digital multimeter
  - Battery tester
  - Screw drive set
  - Screw, bolts and nuts
- **Suggested Solution**

This procedure should be performed annually or whenever batteries need to be replaced.

- Perform Maintenance Shutdown procedure.
- Slide out the desired battery tray.
- Disconnect battery and remove it from the tray. Note battery polarity.
- Mount new battery in tray, clean the posts and cable lugs and connect cables, observing polarity.
- Torque cable connector bolts to battery manufacturer's specifications.
- Using a digital voltmeter which can be read to 0.01 vdc, check voltage across the poles of the new battery. Voltage should be at least 12.40 vdc.
- Apply a generous amount of grease (Dow Corning silicone grease or equal) to the battery posts and connectors.
- Return the battery trays to their normal position. Reconnect the battery tray cables.
- After all battery trays and their batteries are in place and reconnected, verify the UPS rectifier DC link voltage is at proper value: 195 VDC minimum.
- Replace top and left side panels.
- Close the Battery Circuit Breaker only if the link voltage is correct

- **Activity 11**
  - Time required: 90 minutes
  - Following components will be required to perform this activity:
    - Inverter
    - Philips screwdriver
    - Fuses 40A
    - Multimeter
  - **Suggested Solution**
    - Disconnect the Battery+ connection from the battery.
    - Disconnect all wire connections.
    - Using a Philips screwdriver, remove the four screws that secure the plastic lid and carefully remove the lid.
    - Visually inspect the circuit and identify the faulty components.
    - Locate the fuse and inspect them.
    - Blown fuses will have a damaged filament.
    - Use the multimeter to check the working of new fuses.
    - Replace fuses as needed. Replacement fuses should be 40A rated quick-blow automotive type fuses only.
    - Replace lid and secure with the four screws.
    - Reconnect the wires and check the functionality of the inverter

## Notes for Facilitation



- Start the discussion by inviting the participants to join in tell what they have learnt so far and connect it with the present unit.
- Ensure that all the participants have basic knowledge of the tools to be used in the installation.
- Ask them in the beginning of the session, what they learnt from each activity that they performed, such as
  - In activity 1, they learnt how to plug in 3 pin AC connection.
  - In activity 2, they learnt how to check the UPS/inverter with voltmeter and power probe.
- Explain about the importance of testing the product once installed.
- Ensure that you shuffle the members of Group A and B before starting the second team activity.

## Practical

Connect the power optimizer to each photovoltaic module of a Solar Inverter:

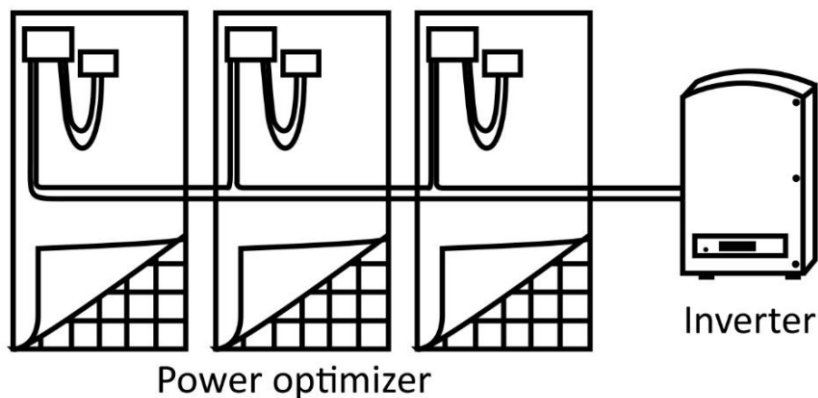


Fig 3.2.3 Solar inverter

### Suggested Solution:

1. Mounting the power optimizer.
  - a. Determine the power optimizer mounting location and position the power optimizer close enough to its module so that their cables can be connected.
  - b. Use the power optimizer mounting brackets to attach the power optimizer to the support structure. For frame-mounted power optimizers follow the instructions supplied with the optimizers.
  - c. If required, mark the location where the hole needs to be mounted and drill the hole.
  - d. Attach each power optimizer to the rack using the M6 (1/4") stainless steel bolts, nuts and washers. Apply torque of 9.5N\*m / 7 lb\*ft.
  - e. Verify that each power optimizer is securely attached to the supporting structure or the module
2. Connecting the PV module to a power optimizer.
  - a. Connect the positive (+) output connector of the module to the positive (+) input connector of the power optimizer.
  - b. Connect the negative (-) output connector of the module to the negative (-) input connector of the power optimizer.
3. Connecting Power Optimizers in Strings.
  - a. Connect the negative (-) output connector of the string's first power optimizer to the positive (+) output connector of the string's second power optimizer.
  - b. Similarly connect the rest of the power optimizers in the string.
4. Test and ensure proper connection.



Measure the voltage of each string individually before connecting it to the other strings or to the inverter. Verify correct polarity by measuring the string polarity with a voltmeter. Use a voltmeter with at least 0.1V measurement accuracy.

### Mount an Inverter:

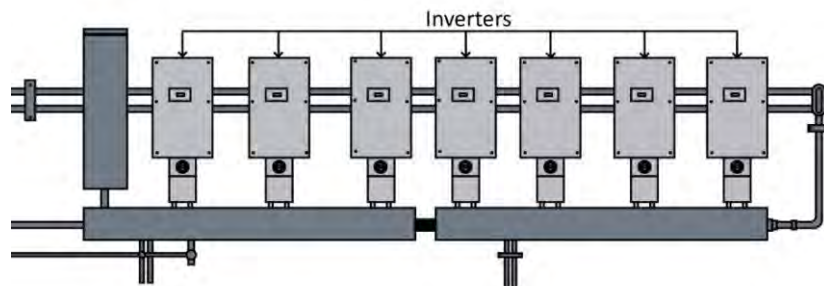


Fig 3.2.4 Mount an inverter

### Suggested Solution:

1. Unpack the inverter and understand the serial number and electrical rating.
2. Determine the inverter mounting location, on a wall, stud framing or pole. To allow proper heat dissipation, maintain the following minimum clearance areas between the inverter and other objects:
  - a. If installing a single inverter:
    - At least 20 cm (8") to the top and bottom of the inverter; if installing an inverter with a DC Safety Unit, make sure to leave sufficient clearance for cable entry.
    - 10 cm (4") to the right and left of the inverter. For easy access to the fans (three phase inverters), you may leave larger clearance.
  - b. If installing multiple inverters:
    - When installing inverters one above the other, leave at least 40 cm (16") between inverters.
    - If installing an inverter with a DC Safety Unit, leave 20 cm (8") between the top of an inverter and the bottom of a DC Safety Unit).
3. Position the mounting bracket against the wall/pole and mark the locations for drilling the holes.
4. Ensure that the flat side of the bracket is at the bottom.
5. Determine which and how many holes to use according to mounting surface type and material.
6. Drill the holes and mount the bracket. Verify that the bracket is firmly attached to the mounting surface.

7. Hang the inverter on the bracket lift the inverter from the sides, or hold it at the top and bottom of the inverter to lift the unit into place. Do not lift holding the DC Safety Unit as it may be damaged.
8. Align the two indentations in the inverter enclosure with the two triangular mounting tabs of the bracket, and lower the inverter until it rests on the bracket evenly.
9. For inverters with DC Safety Unit, secure the Safety Switch bracket to the wall:
  - a. Mark the location of the bracket screw and drill the hole.
  - b. Fasten the bracket using a standard bolt.
  - c. Verify that the bracket is firmly attached to the mounting surface.
10. Insert the two supplied screws through the outer heat sink fin on both sides of the inverter and into the bracket. Tighten the screws with a torque of 4.0N\*m / 2.9 lb.\*ft.

### Connect the AC grid to the inverter and start the inverter:

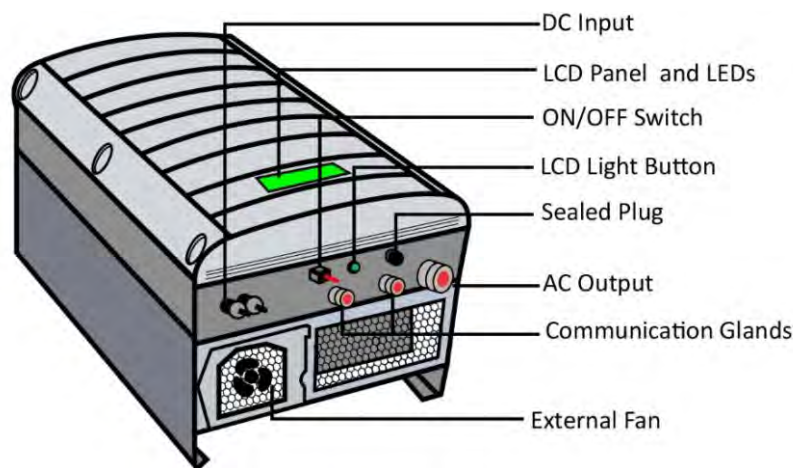


Fig 3.2.5 Connecting AC grid to the inverter

### Suggested Solution:

1. Use a three-wire cable for a single-phase connection or a five-wire cable for three phase connection. The maximum wire size for the input terminal blocks is 16mm<sup>2</sup>.
2. Turn OFF the AC circuit breaker.
3. Open the inverter cover: Release the Allen screws and carefully move the cover horizontally before lowering it.
4. Strip 58mm / 2.32" of the external cable insulation and strip 8mm / 0.32" of the internal wire insulation
5. Open the AC cable gland and insert the cable through the gland
6. For three phase inverters, attach the supplied Ferrite bead to the AC wires:
  - a. Insert the AC wires through the supplied bead.
  - b. Connect the AC wires to the terminal blocks.
  - c. Tighten the wires to the bead using the supplied T-wrap.
7. Depending on the inverter type (single phase or three phase), connect the AC.
8. Connect the PE (grounding) wire first.

9. Connect the wires to the appropriate terminal block connectors in the inverter.
10. Tighten the terminal block screws with a torque of 1.2-1.5N\*m / 0.88-1.1 lb\*ft.
11. Check that the wires are fully inserted and cannot be pulled out easily.
12. Tighten the AC cable gland with a torque of 2.8-3.3N\*m / 2.0-2.4 lb\*ft. 10.
13. Verify that there are no unconnected wires to the inverter and that the unused terminal screws are tightened.
14. Connect the string to the DC input pairs. If required, connect additional strings in parallel using an external combiner box/branch cables before connecting to the inverter.

### Install a pure sine wave solar inverter:

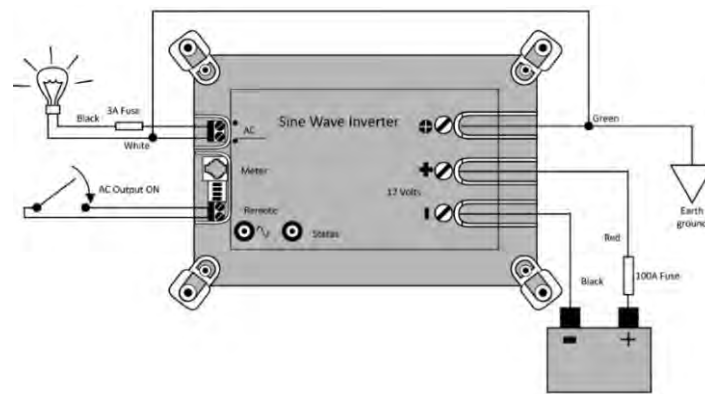


Fig 3.2.6 Installation of pure sine wave solar inverter

### Suggested Solution:

1. Select the location of the Solar Inverter by the following criteria:
  - A. Protection from unauthorized handling.
  - B. Dry dust free room, no condensation, no rodents.
  - C. Never install directly over the battery and never in a cabinet together with the batteries.
  - D. Keep ventilation holes free. The ventilation of the Solar Inverter is designed in such a way that it will work most efficiently when mounted vertically.
  - E. In mobile installation it is important to keep vibrations to a minimum.
2. Set the parameter on the inverter enable the equalizing charge option(only in case of lead acid battery)
3. Make the connection between batteries positive fuse with red cable.
4. Make the batteries negative terminals connection with black cable.
5. Carefully make connections of the cables to the terminals to avoid any spark.

6. Install the battery circuit breaker.
7. Connect the AC output to the AC OUTPUT screw terminal using a 3 core cable with conductors as:
  - OUT/N for neutral, GND for ground and OUT/L for live.
8. Connect the AC input from the electricity grid or generator with the AC INPUT screws using the 3 core cables with connector as:
  - IN/N for neutral, GND for ground and IN/L for live.
9. Check the voltage from voltmeter of the module, the reading should be as:
 

Power Master PM –1500SL –12 / PM – 3000SL –12 17-25V / 30A  
Power Master PM –1500SL –24 / PM – 3000SL –24 34-45V / 30A

## Perform installation of an UPS/Inverter at site:

### Suggested Solution:

1. Unpacking and inspecting the unit:

#### Main Housing and Inverter

- a. Visually inspect the packaging for any damage happened during shipping and transportation.
- b. Remove the packaging by using an unpacking knife.
- c. Lift the housing and the inverter from the packaging safely with the help of handles provided on sides of the modules (As shown in the figure)
- d. Inspect for any damage, scratch, dent or any broken/missing part

#### Battery

- a. Visually inspect the outer packaging for any damage or leakage.
- b. Open the packaging with the help of unpacking knife, Lift the batteries out of the packaging using the handles provided at the ends of the battery (As shown in the figure below). Keep the battery in up straight position. (Do not discard the packaging)
- c. Again inspect the battery for any damage, leaks, disrupted terminals and broken filling caps.
- d. If there is any fluid deposited over the battery or terminal then remove it by wearing protective gloves and using distilled water.
- e. Check the fluid level in the battery cell is at the optimum level. If not then fill distilled water in the cell by wearing protective gloves.

- f. Check the specific gravity of the battery using a hydrometer, ensure that it should be between 1230 and 1250. Charge the battery if the specific gravity is below 1230.

## 2. Installation

### Main Housing

- a. Move the chassis or housing to the desired location and make sure that the location chosen should match the specifications given for the set up by the manufacture, such as:
  1. The site should not be in direct sunlight.
  2. The site should be properly dry and away from any fluid source.
  3. The vents of the housing should have a minimum 15 cm of clearance space.
- b. To obstruct the movement of the housing lock the wheels.

### Battery Installation

- a. Take out the rear panel by removing the screws on the rear panel (shown in the above image) of the cabinet using a Philips screw driver.
- b. Remove the lid on the top of the cabinet.
- c. Place the first battery from the rear end of the cabinet and place it so that the positive (+) terminal is in right. Now, place the second battery so that the positive end is in the left (As shown in the figure below). Use the handles provided over the battery for holding and slide the batteries carefully. Avoid tilting the batteries.
- d. Make connections like (As given in the above image):
  - i. Red coloured battery cable to the positive terminal of the battery.
  - ii. Black coloured battery cable to the negative terminal of the first battery.
  - iii. Black battery cable to the positive terminal of the first battery and to the negative terminal of the second battery.
  - iv. Check the connections made are secure.
- e. Install the rear panel and mount the screws.

### Inverter Installation

- a. Put the inverter on top of the cabinet by placing the feet of inverter in the gaps provided at the top of the cabinet.
- b. Cut off the power supply of the site.

### 3. Wiring

- a. Make the cable connections by connecting one end of electrical cable of the double pole switch circuit with the local electric standards and other ends with the given IEC connector, then with the rear panel input connector given in the assembly (as shown in above image).
- b. Take the wiring coming out of the top of cabinet from the batteries to the back panel of input connector of the inverter (as shown in above image) marked as 24 V battery.
- c. After completion of home wiring, batteries and inverter, turn on the main power supply from double pole circuit.

### 4. Install Wiring Management Kit

Insert the wire management kit over top of the cabinet and align them with the holes provided.

## Troubleshoot an UPS/Inverter after installation and perform a manual bypass test:

### Suggested Solution:

1. Check if the inverter fails to operate when mains power is turned on, or during a utility power failure.
  - A. Check that the battery connections are tight and secure.
  - B. Check that the power of the mains supply is turned on.
  - C. Check that the inverter HOME/AWAY switch in the HOME position.
  - D. Check that the batteries are fully charged.
  - E. Check and reset the circuit breaker by pushing it fully inward until it stops; release the circuit breaker.
  - F. Ensure all the wiring connections are tightly secured.
2. Check if the computer load reboots when inverter switches to ON BATTERY.
  - A. For computer-type loads, a separate battery back-up (UPS) should be used, as the 60 millisecond transfer time is inadequate, and will cause the computer to reboot.
  - B. Separate battery back-up unit like UPS should be used for loads like computer systems because they are not suitable for transfer time of 60 millisecond and will reboot.
3. Inverter faults.
  - A. Inverter drops the load: Inverter may have an internal failure. If this happens, the unit can be disconnected from the mains by completion of a Manual Bypass.
  - B. Inverter is overloaded: Turn off some loads connected to the Inverter until the OVER LOAD LED is no longer lit.

#### 4. Manual Bypass

- A. In condition of an inverter failure or dead battery, disconnect the mains and restore the power of the circuit by commissioning manual by pass of the inverter.
- B. Remove the wiring management kit from the top of the inverter.
- C. Remove all wirings from the back panel.
- D. Connect the input socket wire to the output socket wire directly.

### Install the UPS in smart mode and in standard mode:

#### Suggested Solution:

##### 1. Smart mode

- A. Remove the dust cover from the serial port before connecting the cable.
- B. Attach the RS-232 cable (P/N 321-593-002) to COM1 or COM2 on the CV60 and tighten the screws to the DB-9 connector.
- C. 2 Connect the other end of the RS-232 serial cable to the RS-232 connector on the UPS and tighten the screws.
- D. 3 Connect the cable from the UPS power OUT to the CV60 power input connector. Tighten the connector.
- E. 4 Connect the cable (P/N 226-341-005, six foot cable or P/N 226-341-006, three foot cable) from the DC-DC converter to the DC input connector on the UPS.

##### 2. Standard mode

- A. Connect the cable (P/N 226-341-005, six foot cable or P/N 226-341-006, three foot cable) from the DC-DC converter to the DC input connector on the UPS.
- B. Connect the cable from the UPS power OUT to the CV60 power input connector. Tighten the connector.

### Perform installation of UPS Internal Power control wiring and External Power Control Wiring:

#### Suggested Solution:

##### Installing UPS Internal Power and Control Wiring

**NOTE:** The cables used in steps 2 through 4 are coiled inside the Input/Rectifier cabinet and are attached at the factory to the output of the rectifier. The cables used in steps 7 and 8 are coiled inside the Module Bypass Cabinet (MBC) and are attached at the factory to the input of the MBC.

1. Remove the plastic shield covering the inverter input section of the Output/Inverter cabinet.
2. Route DC Link cables from the rectifier output (Input/Rectifier cabinet) through cut-out in cabinet sides to the inverter input (Output/Inverter cabinet).

3. Connect positive DC Link power wiring to the inverter input. Connect two cables to each inverter.
4. Connect negative DC Link power wiring to the inverter input. Connect two cables to each inverter.
5. Reinstall inverter input section plastic shield.
6. Remove the plastic shield covering of the inverter output section of the Output/Inverter cabinet.
7. Route the MBC input cables from the MBC through cut-out in cabinet sides to the inverter output (Output/Inverter cabinet).
8. Connect phase A, B, and C and Neutral power wiring from MBC to the respective inverter output. Refer to Appendix A of this manual for terminal locations and tightening torques.
9. Route ground braid from top of Output/Inverter cabinet to Input/Rectifier cabinet through cabinet cut-outs. Braid is secured at the factory to the
10. Connect ground braid to Input/Rectifier cabinet mounting stud and secure.  
Route ground braid from top of MBC to Output/Inverter cabinet through cabinet cut-outs. Braid is secured at the factory to the MBC mounting stud.
12. Connect ground braid to Output/Inverter cabinet mounting stud and secure.
13. Reinstall inverter output section plastic shield.
14. Connect the Output/Inverter 15-pin control wiring harness connector to the Input/Rectifier 15-pin control wiring harness connector.
15. Connect the MBC 15-pin control wiring harness connector to the Output/Inverter 15-pin control wiring harness connector.
16. Connect 3-pin control wiring harness connector P6 from the MBC to connector J6 on Inverter number 2 control board.

#### Installing UPS External Power and Control Wiring

1. Remove the sheet metal shield covering the input terminal area in the Input/Rectifier cabinet to gain access to the Battery I/O Customer Interface and CB2TB.

**NOTE:** Remove Input/Rectifier cabinet conduit landing plate to punch conduit holes.

2. Connect phase A, B, and C power wiring from source to respective rectifier inputs in the Input/Rectifier cabinet.
3. Connect positive and negative DC power wiring from batteries to the respective DC inputs in the Input/Rectifier cabinet.

**NOTE:** Remove entire MBC top panel to punch conduit holes.

4. Connect phase A, B, and C power wiring from bypass source to respective bypass inputs in the MBC cabinet.
5. Connect phase A, B, and C and Neutral power wiring from MBC output to critical load.
6. Connect control wiring (battery breaker open and close signals and shunt DC disconnect) between external battery disconnect and the UPS. Refer to
7. After wiring the UPS system to the facility power and critical load, be sure to ground the system according to local and/or national electrical wiring codes.
8. Install batteries in accordance with all applicable codes and regulations, including the National Electrical Code (NEC)







**Skill India**  
कौशल भारत-कुशल भारत



सत्यमेव जयते  
GOVERNMENT OF INDIA  
MINISTRY OF SKILL DEVELOPMENT  
& ENTREPRENEURSHIP



N · S · D · C  
National  
Skill Development  
Corporation

Transforming the skill landscape

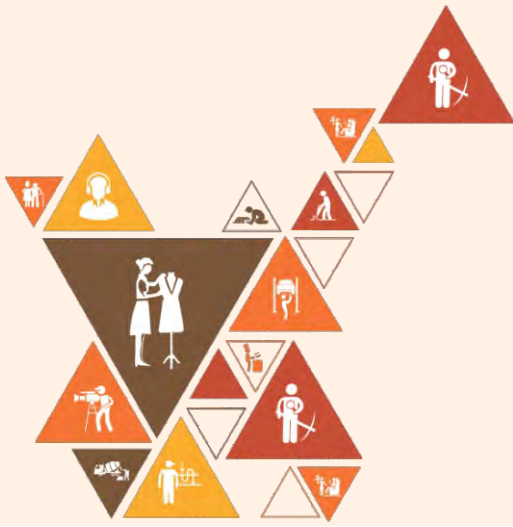


## 4. Interact with Co-workers

Unit 4.1 – Interact with Supervisor

Unit 4.2 – Interact with Colleagues

Unit 4.3 – Soft Skills



(ELE/N9962)

## Key Learning Outcomes

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

- Identify the correct way of interacting with supervisors and colleagues
- Identify soft skills required for doing the job of a technician

## UNIT 4.0: Objective of the Module

### Objective of the Module

The objective of this module is to make the participants identify the work requirements for the task assigned to them. In addition, they will also be able to identify the importance of working in a team and efficiently communicating with the team members. Finally, in this module, the participants will be able to develop and use certain soft skills that will help them work efficiently with colleagues and supervisors.

### Ask

- Ask the participants if they know what the job of a technician is and what all does it involve.
- Ask the participants to tell what according to them are the skills required to do the work of a technician.
- Ask them if they know whether a technician works in isolation or in a team.
- Ask them to share their expectations from this course.

### Notes for Facilitation

- Make the session interactive by involving the participants in a discussion and introduce the topics to them.
- You could ask the participants about the expectations from the course. Then, inform them briefly about the major topics that will be covered in this course.
- Invite the participants to share their expectations on the whiteboard/blackboard.
- Give the participants a brief overview of the subject matter that will be covered in the course.

## UNIT 4.1: Interact with Supervisor

### Unit Objectives

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

- Identify work requirements
- Describe work ethics
- Identify the correct way to interact with supervisor
- Use customer feedback

### Ask

- Start the session by asking the participants what they think the job of a technician is.
- Ask them to tell if they know about the skills required to do the work of a technician.

### Say

- Tell the participants that they have to understand the task which has to be performed. This includes understanding:
  - the requirements of the task,
  - the need to be competent and knowledgeable to do the task and
  - the need for an ability to solve a problem.
- Tell the participants that they must realize that the supervisor is assigned to get the work done. They should always follow the chain of command or the line of authority for a smooth flow of work.
- Tell them to be proficient with the various tools and equipment, which will be required to perform the task.
- Apprise them to keep abreast with new developments and new product models that are in the market. Tell them that they should ask their supervisor if he knows about any new product or new developments that are in the market. They must read about them in magazines, journals and on websites.
- Advise the participants to always plan and organize their work for greater efficiency. Tell them that they can keep control on their work by measuring it against the standard or the bench mark.

## Ask

- Ask the participants if they can tell what work ethics are and whether there are ethics involved in the work of a technician.
- Also, ask them if they know why the feedback of a customer is important.

## Notes for Facilitation

Tell the participants that for certain urgent matters, it is the duty of the technician to report to the supervisor or interact with him immediately. Some examples include:

- If they notice any safety breach, which can result in an accident, they must escalate the matter to their supervisor.
- If they notice any unethical action happening around, they must report to their supervisor.
- If they observe any other work related issue, which may raise a concern, they should escalate the matter to their supervisor.

## Say

- Tell the participants that feedback helps to understand problems and outlines the scope for further improvement. It helps to identify the areas of competency in the work which they have done. It also makes the customer feel happy that they can give feedback regarding the service. The feedback also helps the supervisor to monitor their work, efficiency, and other key performance aspects of their work that may relate to appraisals and further assignments.
- Tell them to remember that all the members of a team, whether a senior or a junior, may work together or may work on different projects to fulfil the organizational goals. Therefore, it is important to understand that the role of each team member is significant for the organization.
- Inform them that the process flow of the work that takes place in a day in the life of a technician includes:
  - Issuing the tools from the stores. They must ensure that after issuing the tools, they use them properly and return after the work is done.
  - Attending to customer complaints.
  - Helping their colleagues, if it is required.

## UNIT 4.2: Interact with Colleagues

### Unit Objectives

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

- Define the role of team members
- Identify the correct way to interact with colleagues
- Identify work place relationships
- Explain work behaviour

### Say

Highlight to the participants the importance of the following:

- Working in a team.
- Aligning the team members to the targets and everyone working in coordination and harmony.
- All the members being different and each one having a special quality to be in the team.
- Adhering to time and quality.

### Explain

Explain to the participants that:

- Work that is assigned to them will also have certain timelines which they should follow. It is important to adhere to the targets and timelines so that there is no conflict between the team members and there is no delay.
- Work done should always match to the company delivery standards. There are incentives for commendable work. Be aware of such incentives and perform to achieve them. This leads to having a sense of satisfaction and achievement.
- The manager has certain duties and responsibilities. It is the duty of the manager to get the task done, which may not involve working directly on the UPS/Inverter
- Similarly, a supervisor may direct about the work which is to be done. The task could involve getting all the technicians to perform the work as per the allocation and to maintain healthy and safe working conditions.
- The technician should be able to work in harmony with the other colleagues or members in the team. In case of any conflict, the objective should be to resolve it by communicating with each other. Sometimes an intervention by a senior may be required to resolve the conflict. At such times, the matter should be reported to the supervisor.
- While performing work or any other interaction related to work, the interest of the organization should be kept at the forefront.

- All the members may work together or may work on different projects to fulfil the organizational goals.
- It is important to understand the role and the responsibility of each one of the team members and the task being performed by that person.

## Notes for Facilitation

- For the activity, Role play, do the following:
  - Ask one participant to play the role of a technician and two of them to become colleagues of the technician.
  - In case the participants hesitate or do not know where to begin, provide them hints, such as the basic roles and responsibilities of a technician.
  - Ask them that in case of an emergency, a task to be done immediately or an urgent report, whom they should contact. And once their task for the day is over, then whom should they report to or inform about the day's tasks.
  - Explain to the participants that the objective of this role play is to understand the following:
    - Way to handle a difficult situation
    - Work of a technician
    - Role and responsibility of each team member
  - Give participant time to prepare for the role play for 15 minutes and then perform it. Ask one participant to play the role of the colleague shouting and another one to be another colleague. Ask a third participant to be the technician to solve the problem.



## UNIT 4.3: Soft Skills

### Unit Objectives

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

- Identify good communication skills
- Explain team work
- Demonstrate decision making skills
- Recognize reflective and critical thinking skills

### Say

- Tell the participants that communication is a two-way process.
  - The sender, who has a need to communicate with another person, the receiver, can send a message. This happens in a medium and reaches the receiver who then responds, based upon the understanding of the message.
  - Communication can be said to be complete only when the receiver understands the message in context in which it was meant to be understood.
- Give an example to the participants. In the morning when they join for work, their supervisor allocates the task for the day. Manual and diagram is the written medium of communication. What their supervisor tells them, becomes the spoken communication. In this case they are the receiver of the message. When they respond after having understood the message that becomes a feedback.
- Tell the participant that communication includes:
  - Verbal Communication – It mainly consists of the spoken words, such as, talking to team members and talking on phone with the customer.
  - Non-verbal communication – It consists mainly of gestures, facial expressions and movements. Showing thumbs up to say that the connection of a wire is done to an assistant, who is far away, or calling the assistant, by waving, to come closer with the cord are types of non-verbal communications.
  - Written communication – It is the written form of communication such as, reports, analysis and e-mails. A written document can be a report which has been submitted or an application.
- Then inform the participants about some basic Dos and Don'ts of communication using the following points:

Dos	Don'ts
Communication should be very clear and precise. Mention all the details required to take action. Also, mention clearly the action intended.	Don't communicate when you are not sure. Also, never give incorrect details.

Communication should be concise or short. It should not have irrelevant details which is of no concern to the recipient of the message.	Never give incomplete message.
Communication should be concrete. Mention the specific and actionable things.	Never communicate in an uncourteous way
The message in communication should be coherent or should be related. If something extra has to be mentioned then mention clearly that it is an addition. Meaning is derived when the entire message is in context.	Don't use jargons that the recipient may be unfamiliar with. Don't use complex words or sentences.

Fig 4.3.1 Dos and Don'ts

## Explain



- Explain to the participants that to be able to listen actively and to ensure that they can respond and understand efficiently, they need to:
  - Stop talking to listen to what the other person has to say.
  - Remove any external noise or distractions.
  - Deter from jumping to a conclusion or responding the moment the other person begins to speak.
  - Try not to be defensive in a conversation, especially when receiving a feedback.
  - Show interest in listening to a person, who is speaking, through non- verbal clues such as a nod or words such as hmm and yeah.
  - Ask for details to get the complete information.

## Notes for Facilitation



Finally, explain to the participants, the concept of team work and team building. Tell them that:

- Teamwork is defined as coming together of people to achieve a common goal. The goal here are the organizational goals. The daily tasks which are assigned are a part of the organizational goals. Team work means that each member in the team is contributing their bit to the overall tasks.
- In a team, all the members are important and might be dependent on each other for work. Sometimes the members do the work individually. However, the collective result is a team effort, similar to what will be seen in a game of cricket, or during the construction of a building or building an aircraft. It is also important to understand that the work may depend on the completion of the tasks. Therefore, for smooth progress of work, the tasks should be completed on time.

- For the activity, The Communication Game, do the following:
  - Tell the participants that the objective is to understand the importance of the following:
    - Verbal communication
    - The type of instructions which should be given
    - Feedback
    - Direct interaction with the concerned person for proper communication.
  - Take 5 minutes for each activity. Ensure that you have simple and not too complicated images, which can be work related or general.
  - Make the participants sit back to back or behind the board and then they must pass the instructions to describe/ draw.
  - Later, after the activity, you can comment on how the instruction passing and interpretation could have been better.
  - Debrief: In a team, it is important that one person takes command and the other follows. Having a clear understanding of what the other member is saying requires active listening and proper understanding.
- For the activity, Case Discussion, do the following:
  - Tell the participants that the objective of the activity is to understand the importance of the following:
    - Planning and scheduling of work
    - Organizing task
    - Handling work pressure
    - Maintaining helping but assertive behaviour
    - Being responsible and accountable for work
  - Divide into groups of four. Let the participants discuss the case for 20 minutes and come up with solutions for their colleagues. Have a presentation in the room where all the groups should individually present the case.
- For the activity, Team Game, do the following:
  - Tell the participants that the objective of the game is to understand the importance of the following:
    - Non-verbal communication
    - Leadership
    - Team work
  - Make pairs and ask the participants to stand behind their partner, with their backs to each other. The partner facing the facilitator will be given a component of the UPS/Inverter. He/she needs to describe it and the other partner needs to tell its name. The important point here is that you cannot say the name or tell the direct use of that component, but can just describe it.
- For the activity, Case Discussion, do the following:
  - Tell the participants that the objective of the activity is to understand the importance of the following:
    - Identifying a problem or spotting disruptions in work

- Understanding and analysing the issue
- Developing alternatives for the solution and choosing the best option
- Divide into groups of four. Let the participants discuss the case for 20 minutes and come up with solutions for their colleagues. Have a presentation in the room where all the groups should individually present the case.

## Ask



- Ask the participants what decision making is.
- Ask them if they think that decision making is difficult and the reason for it.
- Ask them to tell what they know about reflective thinking. Also, ask the participants what they understand by the term “critical thinking”.

## Say



Tell the participants that decision making process has the following steps:

- The first step in a decision-making process is to identify the problem.
- Then, gather details about the problem and its possible solution. The more data they have the better decision making they can do.
- Third step is to analyse the problem. They may need to use mathematical or statistical tools to arrive at a point, which will help them to take a decision.
- Develop alternatives, which will help to have a plan B in case plan A does not work.
- Finally, choose the best option.

Then, tell the participants about some pointers that they need to keep in mind for decision making and critical thinking, such as:

- It is based upon previous knowledge and they will draw their learning from it.
- It will help them to understand the process and suggest improvements by eliminating the waste.
- It requires them to be thorough with the process and also be updated with new developments.
- Critical and reflective thinking will help to spot the process disruptions and the reasons for it.
- Analyse the reason for the delay and how the improvements can be done.

The critical thinking process can be defined as given in the following figure:



Fig 4.3.2 Critical thinking process



**Skill India**  
कौशल भारत - कुशल भारत



सत्यमेव जयते  
GOVERNMENT OF INDIA  
MINISTRY OF SKILL DEVELOPMENT  
& ENTREPRENEURSHIP



N S D C  
National  
Skill Development  
Corporation

Transforming the skill landscape



Skilling India in Electronics

# 5. Employability & Entrepreneurship Skills

Unit 5.1 - Personal Strengths & Value Systems

Unit 5.2 - Digital Literacy: A Recap

Unit 5.3 - Money Matters

Unit 5.4 - Preparing for Employment & Self-Employment

Unit 5.5 - Understanding Entrepreneurship

Unit 5.6 - Preparing to be an Entrepreneur



## 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 favorite 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?"

1. Have one of the participants write their contributions on a flip chart sheet.
2. Write down your own list of covered material in the training on another flip chart sheet.
3. Compare the two sheets, commenting on what will and what will not be covered during the training.
4. Set some ground rules for the training sessions. Ask the participants to put these rules on a flipchart and display it in the class.
5. You may get back to those sheets once again at the end of the last session of the training.
6. 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.
7. 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

8. Explain the contents that are going to get covered one by one and connect it with the expectation mapping done earlier.
9. 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**

1. Defining the objectives in the beginning of the units sets the mood for the unit.
2. To begin with the end in mind sets the expectations of the participants as what could be the important takeaways from the session.
3. It is also a way of making participants take responsibility of their own learning process.
4. 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 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 behavior. 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 behavior 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 5.1: Personal Strengths & Value Systems

### Key Learning Outcomes

At the end of this unit, you 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 Swachh 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 5.1.1: Health, Habits, Hygiene: What is Health?

### Unit Objectives

At the end of this unit, the 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 5.1.2: 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 5.1.3: 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 a live. 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 5.1.4: 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

- 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 5.1.5: 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.

Soring's idea is to have a centralized 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 Sebasthiyar 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 5.1.6: 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**

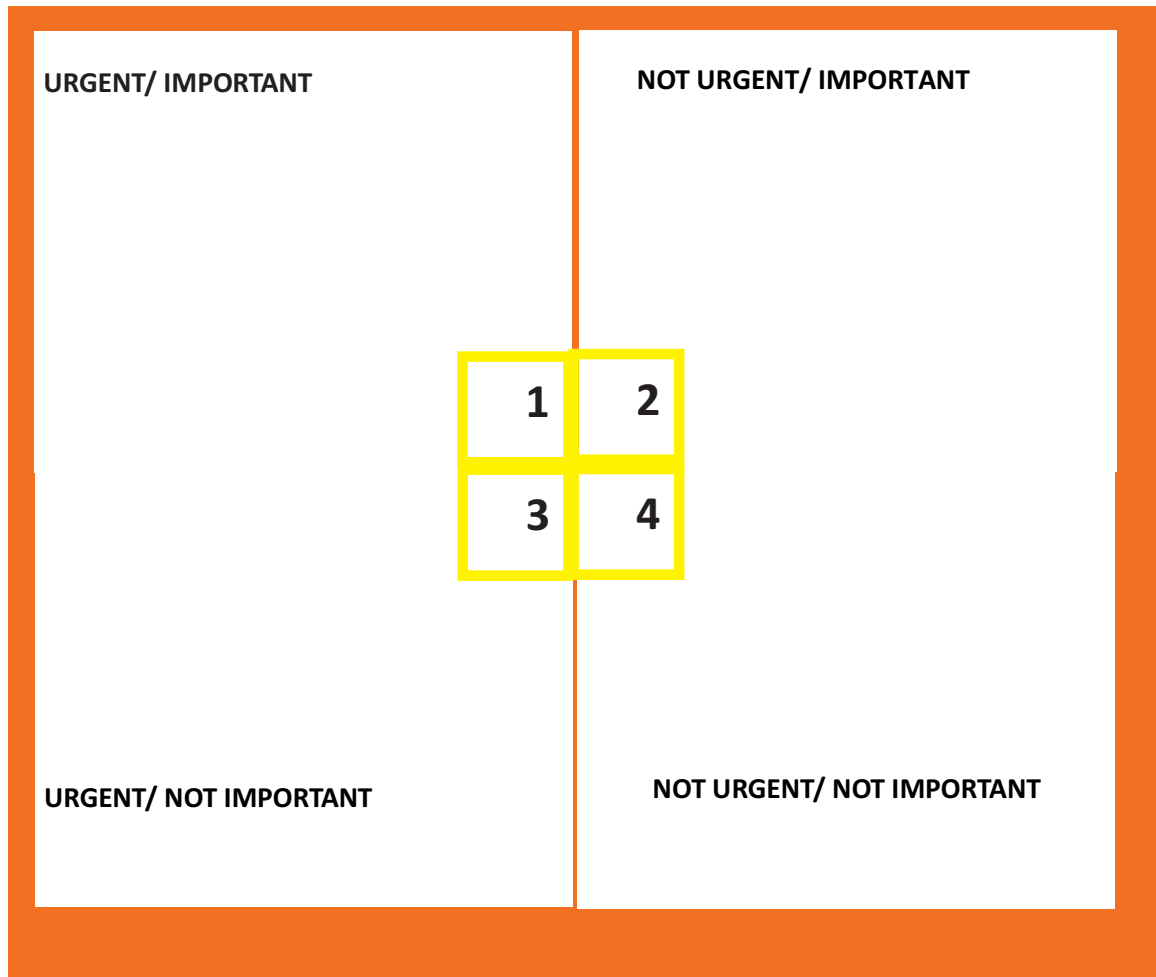
1.	
2.	
3.	
4.	
5.	
6.	

7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
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" style="margin: auto;"> <tr><td style="padding: 10px;"><b>1</b></td><td style="padding: 10px;"><b>2</b></td></tr> <tr><td style="padding: 10px;"><b>3</b></td><td style="padding: 10px;"><b>4</b></td></tr> </table>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<ul style="list-style-type: none"> <li>• Internet surfing</li> <li>• Social media</li> <li>• Watching TV</li> </ul>
<b>1</b>	<b>2</b>				
<b>3</b>	<b>4</b>				
<p><b>URGENT/ NOT IMPORTANT</b></p> <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>NOT URGENT/ NOT IMPORTANT</b></p>				

**URGENT/ IMPORTANT GRID format**



## 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 5.1.7: 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 5.1.8: 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 5.2: Digital Literacy: A Recap

### Key Learning Outcomes

At the end of this unit, you 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 5.2.1: 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 5.2.2: MS Office and Email: About MS Office

### Unit Objective

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 the required applications

### 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

## UNIT 5.2.3: E-Commerce

### Unit Objective

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 Systems 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 6 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 5.3: Money Matters

### Key Learning Outcomes

At the end of this unit, you 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 5.3.1: Personal Finance – Why to Save?

### Unit Objective

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 5.3.2: Types of Bank Accounts, Opening a Bank Account

### Unit Objective

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 need 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.

<div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto;"></div> <p style="text-align: center; margin: 0;">Photograph</p>	<h1 style="margin: 0;">XXX Bank</h1>																																																												
<h3>SAVING BANK ACCOUNT OPENING FORM</h3>																																																													
Account No.: _____	Date: _____																																																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td colspan="2">Name of the Branch</td><td colspan="2"></td></tr> <tr><td colspan="2">Village/Town</td><td colspan="2"></td></tr> <tr><td colspan="2">Sub District / Block</td><td colspan="2"></td></tr> <tr><td colspan="2">District</td><td colspan="2"></td></tr> <tr><td colspan="2">State</td><td colspan="2"></td></tr> <tr><td colspan="2">SSA Code / Ward No.</td><td colspan="2"></td></tr> <tr> <td>Village Code / Town Code</td> <td></td> <td>Name of Village / Town</td> <td></td> </tr> </table>		Name of the Branch				Village/Town				Sub District / Block				District				State				SSA Code / Ward No.				Village Code / Town Code		Name of Village / Town																																	
Name of the Branch																																																													
Village/Town																																																													
Sub District / Block																																																													
District																																																													
State																																																													
SSA Code / Ward No.																																																													
Village Code / Town Code		Name of Village / Town																																																											
<p><b>Applicant Details:</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Full Name</td> <td>Mr./Mrs./</td> <td>First</td> <td>Middle</td> <td>Last Name</td> </tr> <tr> <td>Marital Status</td> <td colspan="4"></td> </tr> <tr> <td>Name of</td> <td colspan="4"></td> </tr> <tr> <td>Spouse/Father</td> <td colspan="4"></td> </tr> <tr> <td>Address</td> <td colspan="4"></td> </tr> <tr> <td>Pin Code</td> <td colspan="4"></td> </tr> <tr> <td>Tel No. Mobile</td> <td colspan="2"></td> <td colspan="2">Date of Birth</td> </tr> <tr> <td>Aadhaar No.</td> <td colspan="2"></td> <td colspan="2">Pan No.</td> </tr> <tr> <td>MNREGA Job Card No.</td> <td colspan="4"></td> </tr> <tr> <td>Occupation/Profession</td> <td colspan="4"></td> </tr> <tr> <td>Annual Income</td> <td colspan="4"></td> </tr> <tr> <td>No. of Dependents</td> <td colspan="4"></td> </tr> </table>		Full Name	Mr./Mrs./	First	Middle	Last Name	Marital Status					Name of					Spouse/Father					Address					Pin Code					Tel No. Mobile			Date of Birth		Aadhaar No.			Pan No.		MNREGA Job Card No.					Occupation/Profession					Annual Income					No. of Dependents				
Full Name	Mr./Mrs./	First	Middle	Last Name																																																									
Marital Status																																																													
Name of																																																													
Spouse/Father																																																													
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.		

**Declaration:**

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.

**Place:****Date:****Signature / LTI of Applicant****Nomination:**

I want to nominate as under				
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.

**Place:****Date:****Signature / LTI of Applicant****Witness(es)\***

1. \_\_\_\_\_

2. \_\_\_\_\_

\*Witness is requires only for thumb impression and not for signature

## UNIT 5.3.3: Costs: Fixed vs. Variables: What are Fixed and Variable Costs?

### Unit Objective

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

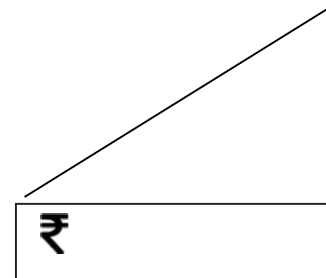
## Do

- 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.

Total Cost  
Variable Cost  
Fixed Cost  
Units



- 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 5.3.4: Investments, Insurance and Taxes

### Unit Objective

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. Mr. Das gets monthly return on one of his insurance policies. Name the policy?  
*Money Back Life Insurance*
2. What are bonds?  
*Bonds are instruments used by public and private companies to raise large sums of money.*
3. Who issues the bonds?  
*Private and public companies issue the bonds*
4. Why are bonds issued?  
*To raise large amount of money as it cannot be borrowed from the bank.*
5. Who is the buyer of stocks and equities?.

*The general public is the buyer.*

6. What types of scheme is the Sukanya Samriddhi Scheme?

*Small Saving Scheme*

7. 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.*

8. Why is a loan taken from the bank to purchase real estate?

*To lease or sell to make profit on appreciated property price.*

9. Name the two types of insurances?

*Life Insurance and Non-life or general insurance*

10. Which insurance product offers financial protection for 15-20 years?

*Term Insurance*

11. What is the benefit of taking an endowment policy?

*It offers the dual benefit of investment and 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 5.3.5: Online Banking, NEFT, RTGS, etc.

### Unit Objective

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.

## 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 5.4: Preparing for Employment & Self-Employment

### Key Learning Outcomes



At the end of this unit, you 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 5.4.1: Interview Preparation: How to Prepare for an Interview?

### Unit Objective

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 5.4.2: Preparing an Effective Resume: How to Create an Effective Resume?

### Unit Objective

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 resume 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 resume.
- 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 5.4.3: Interview FAQs

### Unit Objective

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

<b>Mock Interview Questions</b>
<b>Tell me something about your family.</b>
<b>What qualities would you look for in a Manager or a Supervisor?</b>
<b>Why did you apply for this job?</b>
<b>What do you know about this company?</b>
<b>How do you deal with criticism?</b>
<b>How do you plan to strike a good work-life balance?</b>
<b>Where do you see yourself five years from now?</b>
<b>Have you applied for jobs in other companies?</b>
<b>What kind of salary do you expect from this job?</b>
<b>Do you have any questions for me?</b>

## 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 5.4.4: Work Readiness – Terms and Terminology

### Unit Objective

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 5.5: Understanding Entrepreneurship

### Key Learning Outcomes

At the end of this unit, you 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 5.5.1: Concept Introduction (Characteristic of an Entrepreneur, types of firms/ types of enterprises)

### Unit Objectives

At the end of this unit, the 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](http://mudra.org.in) etc.
- Discuss about various schemes and policies by the Government of India for entrepreneurs.

## UNIT 5.5.2: 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.



Fig 5.5.1: Sharing 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 employee for the breakdown whereas a leader fixes breakdown.
- A boss depends on authority whereas a leader depends on goodwill.
- A boss says “I” and a leader says “We.”
- A boss drives employee 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 5.5.3: Communication Skills: Listening & Speaking: The Importance of Listening Effectively

### Unit Objectives

At the end of this unit, the 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

#### 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 si.**

**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



### 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

### 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 be 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 5.5.4: 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 inquiring 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 atleast 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. 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.
7. Encourage participants to provide constructive criticism during their discussions.

## Summarize



- Wrap the unit up after summarizing the key points and answering questions.



## UNIT 5.5.5: Business Opportunity Identification: Entrepreneurs and Opportunities

### Unit Objectives

At the end of this unit, the 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 5.5.6: 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.

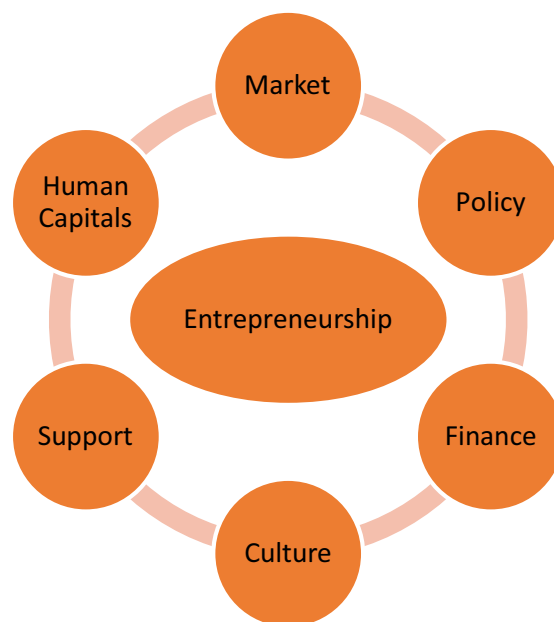


Fig 6.5.2: Key domains of entrepreneurship support eco-system

## 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 5.5.7: 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 5.5.8: 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 5.6: Preparing to be an Entrepreneur

### Key Learning Outcomes

At the end of this unit, you 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 5.6.1: 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 what 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 5.6.2: 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. 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 5.6.3: 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 5.6.4: 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 5.6.5: Procedures and Formalities for Bank Finance

### 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
- 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.

### **CHECKLIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH LOAN APPLICATION (Common for all banks)**

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
13. 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 5.6.6: 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 make a matrix they need to fill.
- They have to write the main topics and key words that will 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 5.6.7: 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.
- 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.





**Skill India**  
कौशल भारत-कुशल भारत



सत्यमेव जयते  
GOVERNMENT OF INDIA  
MINISTRY OF SKILL DEVELOPMENT  
& ENTREPRENEURSHIP



N · S · D · C  
National  
Skill Development  
Corporation

Transforming the skill landscape



## 6. Annexures

Annexure 1 – Training Delivery Plan

Annexure 2 – Assessment Criteria

## Annexure 1

### Training Delivery Plan

Training Delivery Plan			
<b>Program Name:</b>	Field Technician – UPS and Inverter		
<b>Qualification Pack Name &amp; Ref. ID</b>	ELE/Q7201 VERSION 1.0		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	07-May-2017
<b>Pre-requisites to Training</b>	8th Standard pass / ITI / Diploma		
<b>Training Outcomes</b>	<p>By the end of this program, the participants will be able to:</p> <ul style="list-style-type: none"> <li>• Install and trouble shoot the UPS and Inverter.</li> <li>• Interact with customer and understand their problems.</li> <li>• Identify the problem of UPS and Inverter technically</li> <li>• Repair the UPS and Inverter along with proper documentation.</li> <li>• Report to supervisors/seniors with proper documentation.</li> <li>• Follow the standard safety procedures.</li> <li>• Enhance the efficiency of co-workers.</li> </ul>		

Sl. No	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Ads	Duration HH:MM
1	Understand the requirement of customer	Customer Requirement	<ul style="list-style-type: none"> <li>• Fix appointment with customer to visit the site based on the complaint registered /Installation schedule.</li> <li>• Greet the customer and confirm the problem registered</li> <li>• Be polite and patient when interacting with customer</li> <li>• Check the warranty status or annual maintenance contract and anticipate the faults to carry the right tools and parts</li> <li>• Communicate problem effectively in order to secure customer's confidence</li> <li>• Ensure 100% customer satisfaction and positive feedback</li> <li>• Record zero customer complaints post service</li> <li>• Avoid repeat problems post service</li> <li>• Ascertain customer location in order to make the route plan for the day</li> <li>• Prepare most optimum route plan to complete</li> </ul>	ELE/N0061	Facilitator-led – Discussion Demonstration Power-point presentation Audio-visuals- Images	Videos PowerPoints Laptop Projector Screen White board	Theory: 40:00 Practical: 40:00

			<p>daily target visits</p> <ul style="list-style-type: none"> <li>Identify the purpose of customer visit like purchase of accessories, product enquiry and complaints.</li> <li>Understand customer complaints and deliver optimal solution.</li> </ul>				
2	Install the UPS/Inverter	UPS Installation	<ul style="list-style-type: none"> <li>Functionalities of the UPS/inverter and procedures to make settings</li> <li>Basic electrical and mechanical modules of various industrial electronic products</li> <li>Circuit design of the type and model of product</li> <li>Etiquette to be followed at customer's premises precautions to be taken while handling field calls and dealing with customers</li> <li>Relevant reference sheets, manuals and documents to carry in the field</li> <li>Functioning of the appliance and its various modules</li> <li>UPS communication interface and wiring procedures</li> </ul>	ELE/N7201	Facilitator-led – Discussion Demonstration	<p>DC regulated variable power supply 0-24 V, 1Amp Clip on meter (Digital) Battery Charger Hydro Meter Analog multimeter Steel rule 300mm Steel measuring tape-3 m Tools makers vice 100mm (clamp) Tools maker vicec 50mm (clamp) Crimping tool (pliers) Magneto spanner set File flat 200mm bastard File flat 200mm second cut File flat 200mm smooth 100mm flat pliers 100mm round Nose pliers Scriber</p>	<p>Theory: 40:00 Practical: 40:00</p>

			<ul style="list-style-type: none"> <li>• Identification of various status indicators on the control panel of the equipment</li> <li>• Daily, monthly and annual maintenance procedures of the equipment and battery maintenance</li> <li>• Used battery recycling procedure</li> <li>• Basic electronics and electronic components (knowledge of components such as diode, transformer, LED, photo transistor, capacitor, resistor, inductor, thermistors)</li> <li>• Fundamentals of electricity such as ohms law, difference between ac and dc, calculation of energy consumption of appliances, understanding of domestic wiring, understanding of series and parallel connections</li> <li>• Troubleshooting knowledge with respect to UPS/inverters</li> <li>• Hazards, their causes and prevention/personal safety</li> <li>• Frequently occurring</li> </ul>			<p>straight 150mm Hammer ball pen 0.5Kg Allen key set (set of 9) Tubular box spanner (set of 6Nos) Continuity tester Hacksaw frame adjustable Cold chisel 20mm Scissors 200mm Handsaw 450mm Hand Drill Machine Connecting screwdriver 100 mm Neon tester 500 V. Screw driver set (set of 5 ) Insulated combination pliers 150 mm Insulated side cutting pliers 150 mm Long nose pliers 150 mm Electrician knife Tweezers 100mm Soldering Iron Changeable bits 10 W De-soldering pump Digital Multimeter (3 ½ digit) Soldering iron 25 W. 240 V.</p>	
--	--	--	---	--	--	---	--

			<p>faults such as blown fuse, dead battery etc.</p> <ul style="list-style-type: none"> <li>• Components/modules of the UPS/inverter and their price</li> <li>• Removing packaging and checking accessories</li> <li>• Placing and wiring the UPS/Inverter</li> <li>• Complete the documentation</li> </ul>				
3a	Fault Diagnosis skills	Diagnosis skills	<ul style="list-style-type: none"> <li>• Various modes in which the UPS operates and the different LED and alarm statuses</li> <li>• To detect basic electrical faults such defective power cord, connector or internal wiring defect, short/ loose/open contacts, blown fuse</li> <li>• To identify the problem of dead battery and replacement procedure for the same</li> <li>• To identify failure of inverter circuit or inverter driver and to replace any inverter component or the inverter driver</li> <li>• To detect defects in the cooling fan and to defect</li> </ul>	ELE/N7202	Facilitator - led – Discussion Demonstration Power -point presentation Audio - visuals - Images	DC regulated variable power supply 0-24 V, 1Amp Clip on meter (Digital) Battery Charger Hydro Meter Analog multimeter Steel rule 300mm Steel measuring tape-3 m Tools makers vice 100mm (clamp) Tools maker vice 50mm (clamp) Crimping tool (pliers) Magnet spanner set File flat 200mm bastard File flat 200mm second cut File flat 200mm smooth 100mm flat pliers 100mm	Theory: 40:00 Practical: 40:00



			<p>faults due to surrounding temperature being higher than allowed operation range</p> <ul style="list-style-type: none"> <li>• To identify reasons for improper</li> <li>• Functioning of charger board, boost circuit, PFC components or BUS circuit and to replace the identified dysfunctional module</li> <li>• To identify failed resistors and damaged photo couplers in the IGBT driver module resulting in replacement of the module</li> <li>• To identify fault in the charger module if the UPS works on bypass mode normally, but cannot start up completely</li> <li>• To diagnose fault in the SPS module if the equipment does not work in spite of being connected to the input power source</li> </ul>			<p>round Nose pliers Scriber straight 150mm Hammer ball pen 0.5Kg Allen key set (set of 9) Tubular box spanner (set of 6Nos) Continuity tester Hacksaw frame adjustable Cold chisel 20mm Scissors 200mm Handsaw 450mm Hand Drill Machine Connecting screwdriver 100 mm Neon tester 500 V. Screw driver set (set of 5 ) Insulated combination pliers 150 mm Insulated side cutting pliers 150 mm Long nose pliers 150 mm Electrician knife Tweezers 100mm Soldering Iron Changeable bits 10 W De-soldering pump Digital Multimeter (3 ½ digit) Soldering iron 25 W. 240 V</p>	
--	--	--	--	--	--	--	--

3b	Repair Dysfunctional UPS/Inverter	Dysfunctional UPS/Inverter	<p>Diagnose the fault based on customer interaction and initial inspection</p> <ul style="list-style-type: none"> <li>Remove protective panels since the voltage present is potentially lethal</li> <li>Check the air filters and monitor system parameters from the control panel</li> <li>Carry out basic tests such as power supply inspection, volt ampere test and earth test power supply etc.</li> </ul> <p>Separate and inspect every module of the unit if the fault is not identified through basic tests</p> <p>Send to factory for in depth diagnosis, if problem remains un-identified at site</p> <p>Replace component at location, if the fault identified is because of damage of components such as fuse or battery</p> <p>Remove and replace the faulty module with a functional one, either on a second visit or as pre-identified and collected from the service centre, if the problem is at the PCB level or components that cannot be replaced at site</p> <p>Reassemble the unit and make all power and communication wirings</p> <p>Switch on power supply and</p>	ELE/N7202	Facilitator-led – Discussion Demonstration Power-point presentation Audio-Visuals-Images	<p>DC regulated variable power supply 0-24 V, 1Amp</p> <p>Clip on meter (Digital)</p> <p>Battery Charger</p> <p>Hydro Meter</p> <p>Analog multimeter</p> <p>Steel rule 300mm</p> <p>Steel measuring tape-3 m</p> <p>Tools makers vice 100mm (clamp)</p> <p>Tools maker vice 50mm (clamp)</p> <p>Crimping tool (pliers)</p> <p>Magneto spanner set</p> <p>File flat 200mm bastard</p> <p>File flat 200mm second cut</p> <p>File flat 200mm smooth</p> <p>100mm flat pliers</p> <p>100mm round Nose pliers</p> <p>Scriber straight 150mm</p> <p>Hammer ball pen</p> <p>0.5Kg Allen key set (set of 9)</p> <p>Tubular box spanner (set of 6Nos)</p> <p>Continuity tester</p> <p>Hacksaw frame adjustable</p> <p>Cold chisel</p>	<p>Theory: 40:00</p> <p>Practical: 40:00</p>
----	-----------------------------------	----------------------------	---	-----------	--	--	--

			confirm that unit is functioning Check that all the modules of the unit work as per specifications			20mm Scissors 200mm Handsaw 450mm Hand Drill Machine Connecting screwdriver 100 mm Neon tester 500 V. Screw driver set (set of 5 ) Insulated combination pliers 150 mm Insulated side cutting pliers 150 mm Long nose pliers 150 mm Electrician knife Tweezers 100mm Soldering Iron Changeable bits 10 W De-soldering pump Digital Multimeter (3 ½ digit) Soldering iron 25 W. 240 V.	
4	Interact with co-workers	Interaction	Interact with superior Interact with colleagues Organization work policies & its processes Core Skills- Team Work & MultiTasking Professional Skills Potential Source of Accidents Communicating with supervisors Communication Skill Reporting Structure Document the work completed	ELE/N9962	Facilitator-led – Discussion Demonstration Power-point presentation Audio-Visuals-Images	Whiteboard Laptop and LED	Theory: 20:00 Practical: 20:00

			on the company ERP software for tracking and future references Escalate the customer issues and problems that are unresolved in the				
--	--	--	---	--	--	--	--

## Annexure II

### Assessment Criteria

### CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria for “Solar panel Installation Technician”	
Job Role	Field Technician – UPS and Inverter
Qualification Pack	ELE/Q7201
Sector Skill Council	Electronics Sector Skills Council of India
<b>Sr. No.</b>	<b>Guidelines for Assessment</b>
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	Each NOS will have assessed both for theoretical knowledge and practical
3	The assessment will be based on knowledge bank of questions created by the SSC.
4	Individual assessment agencies will create unique question papers for theory and skill practical part for each candidate at each examination/training center.
5	To pass the Qualification Pack, every trainee should score a minimum of 70% 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.

NOS	Assessment Strategy	Marks Allocation		
	Performance criteria	Total	Theory	Practical
1. ELE/N0061 Understand requirement of customer - Interacting with customer prior to visit	PC1. check customer complaint registered at customer care or installation schedule	3	1	2
	PC2. call customer to confirm problem and fix time for visit	4	2	2
	PC3. greet the customer and confirm the problem registered	4	2	2
	PC4. be polite and patient when interacting with customer	3	1	2
	PC5. check about warranty status of appliance and annual maintenance contract	3	1	2
	PC6. anticipate possible problems to carry tools and parts accordingly	4	2	2
	PC7. ascertain customer location in order to make the route plan for the day	4	2	2

ELE/N0061 Understand requirement of customer – Interacting with customer at their premises	PC8. enquire about the symptoms and history of problems in the appliance	5	2	3
	PC9. ask about the age of appliance and status of upkeep	5	2	3
	PC10. identify the problem based on customer’s information	5	2	3
	PC11. communicate the problems identified and educate on possible reasons	5	2	3
	PC12. inform about costs involved	5	2	3
ELE/N0061 Understand requirement of customer – Suggesting possible solutions to customer	PC13. discuss the problem(s) identified with customer	6	2	4
	PC14. suggest possible solutions and costs involved	6	2	4
	PC15. explain the time required and methodology for servicing necessary	6	2	4
	PC16. seek customer’s approval on further action	6	2	4
ELE/N0061 Understand requirement of customer – Achieving productivity and quality	PC17. accurately assess the problem and solution(s) necessary	4	2	2
	PC18. offer most appropriate and cost-effective service as per customer’s requirement	3	1	2
	PC19. communicate problem effectively in order to secure customer’s confidence	3	1	2
	PC20. ensure 100% customer satisfaction and positive feedback	4	2	2
	PC21. record zero customer complaints post service	4	2	2
	PC22. avoid repeat problem post service	4	2	2
	PC23. prepare most optimum route plan to complete daily target visits	4	2	2
		100	40	60
2. ELE/N7101 Install the UPS/Inverter - Undertaking preinstallation site visit	PC1. visit the customer’s premise before carrying out the installation	2	1	1
	PC2. interact with customer to understand where the UPS/inverter is to be installed	3	1	2
	PC3. check that the location meets structural requirements such as solid floor surface suitable for wheeling and heavy weight, weight and clearance requirements	3	1	2
	PC4. make the customer aware of any pre installations/masonry/electrical work to be carried out	3	1	2
	PC5. educate customer about keeping the equipment protected from moisture	2	1	2
	PC6. seek appointment for the next visit	2	1	1
ELE/N7101 Install the UPS/Inverter - Removing packaging	PC7. remove the packaging in which the UPS/inverter was shipped to customer from point of sale/ warehouse	2	1	1

and checking accessories	PC8. check that the product matches the customer order in terms of colour and make	2	1	1
	PC9. if the UPS is not immediately installed, ensure that original packaging is retained	1	0	1
	PC10. check that all supporting accessories purchased have are there in the pack	1	0	1
	PC11. carry out a visual inspection in order to ensure that there are no signs of shipping damages	1	0	1
	PC12. check that tools and fitments required for the installation are available	1	0	1
	PC13. clear up the packaging material waste and dispose as per company's norms	1	0	1
	PC14. remove watches, rings or any other metal objects before installation procedure	1	0	1
ELE/N7101 Install the UPS/Inverter - Placing and wiring the UPS/Inverter	PC15. check if pre installation requirements are met	2	1	1
	PC16. ensure that the room in which the UPS is installed is not airtight and that there is no flammable gas in the environment around	3	1	2
	PC17. maintain minimum space needed for ventilation and service	3	1	2
	PC18. detach all bolts and shipping brackets and separate the UPS cabinet	3	1	2
	PC19. place the UPS at the final location and route and connect the power and control wirings through the top or bottom of the cabinet	3	1	2
	PC20. follow standard wiring procedure while carrying out the electrical installation	3	1	2
	PC20. follow standard wiring procedure while carrying out the electrical installation	3	1	2
ELE/N7101 Install the UPS/Inverter - Checking functioning	PC22. once necessary power and control connections are made, align the UPS/inverter as per the instructions manual	7	3	4
	PC23. demonstrate the features and utility	7	3	4
	PC24. explain the precautions to be taken while using the air conditioner	7	3	4
ELE/N7101 Install the UPS/Inverter - Completing documentation	PC25. fill in customer acknowledgement form	2	1	1
	PC26. seek customer's signature	2	1	1
	PC27. complete other documentation for recording completion of installation	2	1	1
	PC28. call customer care and inform about job completed	2	1	1
ELE/N7101 Install the UPS/Inverter -	PC29. understand the work requirement from superior, periodically	2	1	1

Interacting with supervisor or superior	PC30. report to superior on the work completed	2	1	1
	PC31. escalate the customer issues and problems that are unresolved in the field	3	1	2
	PC32. document the work completed on the company ERP software for tracking and future references	3	1	2
ELE/N7101 Install the UPS/Inverter - Achieving productivity and quality	PC33. remove packaging without damage to the UPS/inverter unit and accessories	2	1	1
	PC34. position the equipment as per requirements specified in instructions manual	2	1	1
	PC35. educate customer on importance of proper placing	2	1	1
	PC36. carry and use the correct tools and equipment for installation	2	1	1
	PC37. operate and check that they are in a safe and stable condition	2	1	1
	PC38. complete installation in time target given	2	1	1
	PC39. educate customer on proper operation and maintenance procedures	2	1	1
	PC40. complete daily field schedule as per instructions/format within the designated time	2	1	1
Total		100	40	60
ELE/N7102 Repair dysfunctional UPS/Inverter - Understanding symptoms and identifying fault	PC1. diagnose the fault based on customer interaction and initial inspection	3	1	2
	PC2. disconnect the power source and open the cabinet doors of the equipment	3	1	2
	PC3. disconnect the battery and wait for electrolytic capacitor to discharge	3	1	2
	PC4. remove protective panels since the voltage present is potentially lethal	3	1	2
	PC5. check the air filters and monitor system parameters from the control panel	3	1	2
	PC6. carry out basic tests such as power supply inspection, volt ampere test and earth test power supply etc.	4	2	2
	PC7. separate and inspect every module of the unit if the fault is not identified through basic tests	4	2	2
	PC8. send to factory for in depth diagnosis, if problem remains un-identified at site	3	1	2
ELE/N7102 Repair dysfunctional UPS/Inverter - Replacing dysfunctional module	PC9. replace component at location, if the fault identified is because of damage of components such as fuse or battery	12	5	7
	PC10. remove and replace the faulty module with a functional one, either on a	12	5	7



	second visit or as pre-identified and collected from the service centre, if the problem is at the PCB level or components that cannot be replaced at sit			
ELE/N7102 Repair dysfunctional UPS/Inverter - Confirming functionality of repaired unit	PC9. reassemble the unit and make all power and communication wirings	3	1	2
	PC10. switch on power supply and confirm that unit is functioning	3	1	2
	PC11. check that all the modules of the unit work as per specifications	3	1	2
	PC12. demonstrate and confirm functionality of the unit with customer	3	1	2
	PC13. educate the customer about cleaning procedures and other best practices	3	1	2
	PC14. collect necessary payments from the customer, if applicable	3	1	2
	PC15. fill in customer acknowledgement form	3	1	2
	PC16. complete other documentation procedures to record complaint closure	3	1	2
ELE/N7102 Repair dysfunctional UPS/Inverter - Achieving productivity and quality	PC17. ensure damage free handling of the unit	2	1	1
	PC18. diagnose the problem accurately and in assigned time	2	1	1
	PC19. identify the problem modules accurately such as the power supply, battery, PCB etc.	2	1	1
	PC20. fix the dysfunctional equipment in designated time	2	1	1
	PC21. rectify completely to avoid repeat fault in the equipment	2	1	1
	PC22. record minimum customer complaints post service	2	1	1
	PC23. meet daily target on attending to number of complaints	2	1	1
	PC24. select the right spares according to recorded complaints at the customer care	2	1	1
	PC25. clearly communicate type of module required to the service centre, if a faulty module is to be replaced	1	0	1
	PC26. secure repairs completion receipt from customer	1	0	1
	PC27. educate customer on air conditioner maintenance and correct practices to follow in order to avoid further problems	2	1	1
	PC28. ensure 100% customer satisfaction	2	1	1
	PC29. recover payments as per rate sheet/ communication from customer care	2	1	1

	PC30. sell related products such as new equipment or Annual Maintenance Contracts (AMC) as per company policy	2	1	1
	Total	100	40	60
ELE/N0062 Interact with coworkers - Interacting with supervisor	PC1. understand work requirements, targets and incentives	5	2	3
	PC2. learn about new product models, their features and functions	5	2	3
	PC3. report problems identified in the field	5	2	3
	PC4. escalate customer concerns that cannot be handled on field	5	2	3
	PC5. resolve personnel issues	5	2	3
	PC6. receive feedback on work standards and customer satisfaction	5	2	3
	PC7. communicate any potential hazards at a particular location	5	2	3
	PC8. meet given targets	5	2	3
	PC9. deliver work of expected quality despite constraints	5	2	3
	PC10. have feedback from a happy and satisfied customer	5	2	3
ELE/N0062 Interact with coworkers - Interacting with colleagues	PC11. resolve inter-personnel conflicts and achieve smooth workflow	8	3	5
	PC12. receive spares from tool room or stores	7	3	4
	PC13. deposit faulty modules and tools to stores	7	3	4
	PC14. pass on customer complaints to colleagues in a respective geographical area	7	3	4
	PC15. assist colleagues with resolving field problems	7	3	4
	PC16. share knowledge and experience gained through every day work	7	3	4
	PC17. clearly demarcate roles of each team member	7	3	4
	Total	100	40	60

Notes

Handwritten notes area consisting of multiple horizontal lines for writing.



**Skill India**

कौशल भारत - कुशल भारत



सत्यमेव जयते  
GOVERNMENT OF INDIA  
MINISTRY OF SKILL DEVELOPMENT  
& ENTREPRENEURSHIP



N.S.D.C.  
National  
Skill Development  
Corporation

Transforming the skill landscape



Skilling India in Electronics

Address : 602-608, 6th Floor, Ansal Chambers-II, Bhikaji Cama Place,  
New Delhi-110066

Email : [info@essc-india.org](mailto:info@essc-india.org)

Website : [www.essc-india.org](http://www.essc-india.org)

Phone : +91-11-46035050

Price: ₹