





Transforming the skill landscape



# **Facilitator Guide**



Sector Electronics

Sub-Sector Industrial Electronics

Occupation Manufacturing

Reference ID: ELE/Q7302, Version 1.0

NSQF Level: 3

# Wireman

**Control panel** 

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

Shri Narendra Modi Prime Minister of India

Х



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CEO

Electronics Sector Skills Council of India

### About this Guide

This Facilitator Guide is designed to enable training for the "Wireman Control Panel" Qualifica on Pack (QP). Each Na onal Occupa onal (NOS) is covered across Unit/s. Key Learning Objec ves for the "Wireman Control Panel" NOS mark the beginning of the Unit/s for that NOS. The symbols used in this book are described below.



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# 1. Fundamentals of Wiring a Control PANEL

Unit 1.1 - Objec ve of the Module

Unit 1.2 - Icebreaker

Unit 1.3 - Introduc on to a Control Panel

Unit 1.4 - Components of Control Panel

Unit 1.5 - Fundamentals of Electricity

Unit 1.6 – Basics Concepts of Automa on and Electromechanical Control System

Unit 1.7 - Tools and Equipment



## Key Learning Outcomes 🕴

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

- Define control panel
- Iden fy the various components of a control panel
- Iden fy the cables used in a control panel
- Define fundamentals of electricity
- Explain basic concepts of automa on and electromechanical control system
- List the tools and equipment used for a control panel

### UNIT 1.1: Objec ve of the Module

# - Unit Objec ves 🧖

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

- Explain the fundamentals of a control panel
- Iden fy the components of a control panel such as cables, various circuit elements and so on
- Demonstrate di erent types of cables used in control panels
- Explain fundamental laws of electricity such as Ohm's law and Kirchho 's Law
- Explain basic concepts of automa on and electromechanical control system

### Ask (ask)

- Ask the par cipants to define control panel.
- Enquire if anybody has ever seen an electrical/electronic circuit. If yes, then ask them to name some components used in the circuit.
- Ask the par cipants to tell the di erence between electrical and electronic components.
- Ask if anyone knows about automa on.
- Ask the par cipants to share their expecta ons from this course.

Notes for Facilita on

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

### UNIT 1.2: Icebreaker

# - Unit Objectives 🤷

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

- Demonstrate the main func ons of a computer and the di erent peripherals devices
- Break the ice between each other

# - Do 🗹

- Make two teams and in the first team, you may have all the par cipants whose names' first alphabet falls between A to M and the other team having the remaining par cipants. 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 dose nor too far.

# - Notes for Facilita on 🗐

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

### UNIT 1.3: Introduc on to Control Panel

# - UnitObjec ves 🤘

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

• Define control panel.

### - Do 🗠

Carry an electricity distribu on control panel.

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?

### Explain 🕅

- Tell the defini on of control panel.
- Explain the labelled diagram of a control panel.
- Then explain the elements of a control panel such as supply, connectors for the outputs, cables, circuit breakers, connector switch, mainframe cabinets, and so on.
- Use the given examples of control panel that are VFD control panel and control panel of an elevator control system to explain further.

### - Notes for Facilita on

• Tell the par cipants that a control panel is a cabinet containing electrical and electronic components to control the motors and other equipment.

- Explain a control panel to them with the help of analogy. Tell them that the building in which they have gathered also has some control panels such as an electrical control panel, a fire alarm control panel, a PBX control panel and so on.
- Tell them a control panel is similar to a control room, which acts as a centr al space where any service can be monitored and controlled. For example, in case of railways, the main control room tells which train is coming on which track and which sta on/pla orm is vacant for which train and so on. Similarly, the control panel taken inputs for electricity/power (which can be related to the trains) and the wires that you put together are the train tracks.

 Inform them that the wiring of these control panels is done by a wireman based on a wiring diagram provided by a design engineer. The wireman's role is similar to that of the engine driver who controls which train goes where, and changes its track on me and as scheduled, ensuring its arrival at the correct sta on. Your supervisor's role is similar to that of the sta on master.

## Say 🦻

- Tell the par cipants that they must have seen many electronic devices such as a radio, television, computer circuit board and many more. They all consist of electrical components such as resistors, capacitors, inductors, transistors, and so on.
- Similarly, control panels comprise of basic electrical components and follow some basic electrical fundamentals to give a customized solu on such as electrical heaters and elevator controllers. Therefore, for wiring of such control panels, it is important to learn about these components and the fundamentals of electricity.
- This brings the need of the next units in this module.

### UNIT 1.4: Components of Control Panel

# Unit Objec ves 🧕

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

- Describe the components of a control panel
- Iden fy cables used in a control panel

### Do 🗸

Carry the following types of cables and circuit elements:

- Diodes and Transistors
- ICs and LED
- Power Sources
- Resistor, Capacitor, Inductor, and Thermistor
- Solenoid
- Transformer
- Coaxial cable, Paired cable, Ribbon cables
- Portable cord

### Say 🤷

- Components are basic building blocks of a control panel.
- It involves simple to complex circuitry based on the number of components used. For example, the complexity of a fire alarm control panel is less than the complexity of a main frame's control panel.
- The main components of a control panel are circuit elements such as resistor, diode, power supply and so on and cables such as coaxial cable, paired cable, portable cord and so on.

Ask 🖻

After showing them the control panel, ask them to:

- Tell about the components of a control panel.
- Iden fy the types of cables used in the panel. No ce the colour of the cables.
- No ce the neatness with which the cables have been connected.

# Demonstrate

- Show them di erent types of cables.
- Show the di erent components of the control panel and classify them as ac ve, passive and electromechanical.

## - Notes for Facilita on 🖳

- Define cable as an assembly of electrical conductors/wires insulated from each other but laid up together (by being twisted around a central core).
- In addi on, tell them that a cable is o en misunderstood with a wire. Explain to them the di erence between a wire and a cable with the help of the following table:

Parameter	Wire	Cable
Defini on	Is a thin, flexible thread of	Is an assembly of electrical
	metal	conductors/wires
Uses	Used to bear mechanical	Used for:
	loads or electricity and	Power transmission
	telecommunica on signals	To connect two or more
		devices
		To carry electric
		currents
Types	Solid wire and stranded wire	Twisted pair cable, coaxial
		cable, mul conductor cable,
		fibre op c cable and so on.

#### Fig 1.4.1: Di erence between wire and cable

- Then explain to them the applica ons of cables such as:
  - o To carry electric current or electric signals from one device to another.
  - o To connect circuits within and between electronic devices.
  - In high voltage power cables (HVPC) for bulk power transmission of alterna ng current (AC) and direct current (DC).
  - o For ESD sensi ve circuits or to provide protec on in high-power/voltage applica ons.
  - In wiring of the building for lighing and power and control circuits such as generators, elevators control panels, temperature control panels and so on.
- Further explain to them the correct way of cable management by the use of products such as cable trays, cable ladders, and cable baskets to support a cable through cabling routes.
- Brief them about the usage of each product such as cable trays which are used as an alterna ve to open wiring or electrical conduit systems, cable ladders provide con nuous support for the cables along their en re lengths and cables are used for data and fibre op cs cables. They are also used when there are mul connec on equipment points such as for telephone or computer network cables, data communica on, any of your cable re cula on requirements and so on.
- In addi on, tell them that:
  - o Coaxial cables are also known as helix cables.
  - Communica on cables are copper conductors. A copper wire is used in telecommunica ons, electronics circuitry, power genera on, power transmission, power distribu on, and so on. Coaxial cable, mul core cables and twisted pair are used as communica on cables.

- Flexible cables, also known as con nuous-flex cables, are specifically designed to cope with the bending of cables and physical stress on the cable inside cable carriers. It is used in automa on.
- In a shielded cable, there is one or more insulated conductors that are enclosed by a common conduc ve layer. The shield may contain braided strands of copper or aluminium, a non-braided copper tape that is wound spirally, or it may contain a layer of conduc ng polymers.
- o Twisted pair cable may be shielded or unshielded.
- Then explain to them about ac ve components using the following points:
  - Those components which generate energy in the form of voltage or current are called ac ve components. If we take a simple real example of an ac ve component then it would be sun, which has its own light and energy.
  - In very simple words, we can say that ac ve components are energy donors.
  - Brief them about each component along with its applica on with the help of the following table:

Components	Applica on	
Integrated Circuit (IC)	<ul> <li>As an oscillator</li> <li>Amplifier</li> <li>Timer</li> <li>Counter, a microprocessor or computer memory</li> </ul>	
Transistors	<ul><li>As an amplifier</li><li>As a switch</li></ul>	
Power Sources	Provides energy (power) to the circuit	
Light Emi ng Diode (LED)	<ul> <li>Avia on ligh ng</li> <li>Automo ve headlamps</li> <li>General ligh ng</li> <li>Tra c signals</li> <li>Camera flashes</li> <li>Lighted wallpaper</li> </ul>	
Solenoid	<ul> <li>Automo ve: interlock device</li> <li>Medical: dialysis machines, dosing equipment and blood pressure monitoring devices</li> <li>Railways: locomo ves, rolling stock, tracks, signals and power distribu on</li> <li>Industrial: locking, cu ng, damping, punching, posi oning, diver ng, holding or rota ng</li> </ul>	

Fig 1.4.2 Ac ve components and its applica ons

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

Components	Applica on
Transformer	To increase (or step -up) voltage
	To decrease (or step -down) the supply voltage
	Radio demodula on
	Power conversion
	Over-voltage protec on
	Logic gates
	Waveform dipper and damper
Resistor	In a low-noise amplifier or a pre-amplifier
	In heavy-duty industrial high-current
Capacitor	Energy storage
	Digital memory
	Pulsed power and weapons
	Power condi oning
Inductors	Energy storage
	Analog circuits and signal processing

Fig 1.4.3: Passive components and its applica ons

- Tell the par cipants that thermistors are widely used as
  - o Inrush current limiter
  - Temperature sensors that is Nega ve Temperature Coe cient or NTC type, self regula ng hea ng elements
  - Posi ve Temperature Coe cient or PTC type self -rese ng overcurrent protectors
- To protect against inrush overvoltage with NTC, resistance will decrease as the temperature will rise. To protect against overcurrent with PTC, resistance will increase as temperature rises.
- Finally, explain them the electromechanical components.
- A er explaining all these components, you can show them a PCB on which mul ple resistors, capacitors, thermistors, diode, motors, generators, transformer and so on have been mounted. Then ask them to iden fy the total number of each component present on the PCB.
- Ac vity handling strategy for Iden fica on Game:
  - Label the components from A to I. Place the components with their labels neatly on a table and ask the par cipants to come with their handbooks, one by one, to look at the components and their labels.

- o Ask the par cipants to match the labels with the names of the components.
- When all the par cipants have done the task, then tell the names of the components one by one and ask the par cipants to check whether they have matched the names correctly or not.

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### UNIT 1.5: Fundamentals of Electricity

# Unit Objec ves 🤘

ask

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

- Define fundamentals of electricity
- The main scope of this unit is to make the par cipants aware about the fundamentals of electricity.
- Tell them that awareness is necessary be cause any wrong connec on in a circuit may cause damage or pose a threat.
- Ask 🔎

Sav

- Ask the par cipants if they know what current and voltage are.
- Then, ask them if they know some laws related to current and voltages.
- In addi on, ask them if they know the di erence between AC and DC current.

## - Explain 🗳

- Explain to the par cipants that in earlier mes most electrical devices used resistors and resistance. Georg Simon Ohm conceptualized the meaning of resistance and came to the conclusion that voltage and current were mathema cally related for wires.
- Tell them that since its concep on, Ohm's Law it has been generalized mul ple mes by di erent people for di erent devices.

### Notes for Facilita on 🗐

• Explain to the par cipants, the Ohm's law. Then tell them about the linear rela on of current and voltage with the help of the following graph, where X axis represents current and Y axis represents voltage.



Fig 1.5.1: Linear rela on between voltage and current

- In addi on, 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 rela onship 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.
  - o Solu on: V=IR

V = 0.5X5 = 2.5V

- Then explain to them Kirchho 's Law.
- Further explain to them electrical polarity. Tell them that electrical polarity (posi ve and nega ve) is used to describe the direc on of current flow in a circuit.
- Inform them that in the diagram in the handbook also current has been shown flowing from the posi ve terminal to the nega ve terminal.

Parameter	Alterna ng Current	Direct Current
Direc on	It reverses its	It flows in one
	direc on while	direc on in the
	flowing in a circuit.	circuit.
Current	It is the current of	It is the current of
	magnitude varying	constant
	with me.	magnitude.
Obtained from	A.C. Generator and mains	Cell or Baery
Passive Parameters	Impedance	Resistance
Power Factor	Between O and 1	Always 1
Types	Sinusoidal, Trapezoidal, Triangular, Square	Pure and pulsa ng

• Tell them the di erence between AC and DC with the help of the following table:

Fig 1.5.2 Di erence between alterna ng and direct current

- In addi on, tell the par cipants that in a direct current circuit, current flows in a single direc on and one pole is always nega ve and the other pole is always posi ve. In an alterna ng current circuit, the two poles alternate between nega ve and posi ve and the direc on of the current (electron flow) reverses periodically.
- Further explain to them about 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.

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# UNIT 1.6: Basic Concepts of Automa on and Electromechanical Control System

# Unit Objec ves 🦉

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

- Explain basic concepts of automa on
- Define electromechanical control system

Ask (ask)

· Ask the par cipants if they know anything about automa on.

- If yes, then ask them to give some examples.
- Ask them if the use of machines ease their daily task.

### Notes for Facilita on

- Define automa on as, automa on means use of various control systems, such as computers technologies for handling di erent processes and machineries in an industry to ease the work of human. Tell them the best example of automa on is IC's, where with the help of automated technologies it is possible to pack over 100 million transistors on a single chip.
- Then tell them a few advantages of automa on:
  - o High produc vity
  - o Improved product quality
  - o High flexibility and accuracy
- Further explain to them the di erent types of automa on along with their advantages and disadvantages:

Type of automa on	Advantages	Disadvantages
Fixed automa on also known as Hard Automa on	<ul> <li>Low unit cost</li> <li>Automated material handling</li> <li>High produc on rate.</li> </ul>	<ul> <li>High ini al cost</li> <li>Rela vely inflexible in accommoda ng product changes.</li> </ul>
Programmable automa on also known as So Automa on	<ul> <li>Highly flexible to deal with design varia ons</li> <li>Suitable for batch produc on</li> </ul>	<ul> <li>High investment in general purpose equipment</li> <li>Lower produc on rate than fixed automa on</li> </ul>

Flexible automa on	Con nuous	Medium
	produc on	of produc on rate
	variable mixture	es • High ini al
	of product	investment
	Flexible to c	leal • High unit cost
	with product	rela ve to fixed
	design varia on	automa on.

Fig 1.6.1: Advantages and disadvantages of automa on

• Next, tell them about basic elements of an automated system are power, program and control systems. In addi on, explain to them about open loop and closed loop control system along with the di erences between them with the help of the following table:

Parameter	Open loop control system	Closed loop control system
Feedback	Absent	Present
Error Detector	Absent	Present
Stability	Stable	Unstable
Construc on	Easy to construct	Complicated construc on
Bandwidth	Small	Large
Accuracy	Inaccurate	Accurate.
Maintenance	Requires less maintenance	Requires more maintenance
Examples	Automa c washing machine, Hand drier, light switch and so on	Automa c electric iron, Servo voltage stabilizer, Cooling system in car and so on

Fig 1.6.2 Di erence between open loop and closed loop control system

- Ask (ask)
- Ask them to give some examples of electrical and mechanical systems.
- Then ask them what they understand by the term electromechanical.
- If you get valid answers, ask them to tell some examples of electromechanical systems.

# - Notes for Facilita on 🗐

- Tell the par cipants that electromechanical systems are a new and rapidly growing field which is an integra on of electronics, mechanics, pneuma cs, hydraulics, and computer control systems to create new and improved automated manufacturing produc on systems.
- Then explain to them electromechanical control systems.
- Further, briefly explain to them various components of an electromechanical control system.

### UNIT 1.7: Tools and Equipment

# Unit Objec ves 🤘

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

· List the tools and equipment used for a control panel

### Ask ask

- Ask the par cipants to name some tools they remember.
- Name the equipment that are used to calculate current, voltage and resistance across the conductors.

# - Notes for Facilita on ២

- · Show the par cipants di erent types of tools and equipment.
- Explain them the usage of each tool and equipment.
- Further inform them that troubleshoo ng is the process of loca ng faults or trouble in a circuit. In addi on, explain to them how the instruments can be used for troubleshoo ng with the help of the following points:
  - 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 e ect on the voltage.
  - Mul meter: It measures all the three quan es like voltage, current and resistance and also includes other features such as a diode tester, which can be used to measure con nuity in circuits.
  - Wa meter: 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 wa meter.
  - Megger: It measures electrical leakage in wire. It is used for verifying the electrical insula on level of any device such as motor, cable, generator winding and so on.
- Ac vity handling strategy for the Iden fica on Game:
  - o Randomly select any par cipant to answer the ques ons.
  - o Ask each ques on from 4-5 par cipants and reveal the correct answer at the end.
  - o Correct answer of the first ques on is Wa meter.
  - o Correct answer of the second ques on is Spanner.









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# 2. Basics of Wiring

Unit 21 – Objec ve of the Module Unit 22 – Wiring Diagram Unit 23 – Wire Specifica ons Unit 24 – Wire Prepara ons Unit 25 – Wire Connec ons Unit 26 – Earthing Unit 27 – Wiring of Basic Circuit





# Key Learning Outcomes 💈

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

- Use wiring diagrams
- Iden fy wire specifica ons
- Prepare wires
- Connect wires
- Explain earthing principles and methods
- Iden fy basic wiring of the circuit components

### UNIT 2.1: Objec ve of the Module

# - Unit Objec ves 🮯

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

- Demonstrate the wiring diagram for wiring the control panel
- Demonstrate wire prepara ons, such as removing the insula on and iden fying di erent wire cu ng, marking and crimping methods
- Explain the connec ons between wires
- · Iden fy di erent circuit elements and components and their basic wiring

## - Ask 🔍

- Ask the par cipants to define wire diagrams.
- Enquire from them if they have seen di erent types of wiring diagrams.
- Ask them if they know the di erence between wire diagrams and block diagrams.
- Ask them to recall the symbols of various components they have studied in the previous module.
- Ask them if they know that each component has its own unique name iden fier. If you get the answer as yes, then ask them to give some examples.
- Ask them if they can tell about di erent types of wire.
- · Ask them to tell how they remove the insula on of wires.
- Ask them to list some wire cu ng tools.
- Ask them to explain crimping.
- Enquire from them if they know anything about di erent types of joints.
- · Ask them to define earthing and explain di erent methods of earthing.
- Ask them to name some components of a control panel such as resistor, capacitor, motor and diode and then ask them to categorise them under ac ve, passive and electromechanical.

# Notes for Facilita on 🗐

- Ini ate the session with the par cipants star ng with the discussion about the objec ves of the module.
- Make the session interac ve by asking the par cipants to share their expecta ons from the module on the blackboard/whiteboard.
- Introduce the topics to be covered and give some informa on about them.
- Give the par cipants a general idea about what will be covered in the module.



### UNIT 2.2: Wiring Diagrams

# - Unit Objec ves 🧖

(ask)

Ask

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

- Define electrical/electronic diagram
- Explain di erent symbols used in wiring diagrams
- Describe how to read the wiring diagrams

Start the session by asking the par cipants if they know what an electrical/electronic diagram is.

- Then ask them to tell the importance of these diagrams.
- Enquire from them if they know that there are di erent types of electrical/electronic drawings.
- Ask them to draw a block diagram of any electronic circuit they know about on the black/white board.

Say ask

- Tell the par cipants that there is a requirement of a diagram which is typically a kind of a technical drawing that gives informa on related to the interior or exterior connec ons between various components of a panel.
- Tell the par cipants that various components are used in a wiring diagram.
- Tell them that it is important to iden fy each component correctly to make the appropriate wiring connec on.
- Also, inform them that it is necessary to know the polarity of each component correctly.

### Ask 🚉

- Ask the par cipants to name a few components such as resistor, capacitor, inductor switches and so on. Ask them to tell their name iden fiers.
- Enquire from them if they know about nets and labels.
- Ask do they know the term polarity. If they say yes, ask them to define it.

### Notes for Facilita on

- Tell the par cipants what electrical/electronic drawings are.
- Explain to them that these diagrams are of three types–block diagram, circuit diagram and wiring diagram.

- Briefly explain to them about each type of diagram with the help of the diagrams given in the par cipa on handbook.
- Tell them that block diagrams are used for higher level, less detailed descrip ons that are intended to clarify overall concepts without concern for the details of implementa on.
- Inform them that unlike a block diagram, a circuit diagram shows the actual electrical connec ons.
- In addi on, tell them that wiring diagram is o en used to troubleshoot problems and to make sure that all the connec ons have been made.
- Also, tell them that wiring diagram is di erent from a schema c diagram and a pictorial diagram.
  - In a schema c diagram, the actual physical loca on of the parts of the finished d evice need not conform with the arrangement of the parts' interconnec ons in the diagram.
  - A pictorial diagram, unlike the wiring diagram which uses symbolic nota ons, has more detailing of the physical appearance of the components and the interconnec ons.
  - In addi on, draw the following images on the black/white board of the same circuit, which shows its schema c and pictorial diagram.



• Further explain to them di erent symbols used in wiring diagram with the help of following table:

Component	Symbol	Applica on
Resistor	A zig-zag line with its two terminals prominently projec ng out	Heaters, fuses, sensors, lights
Capacitors	Two plates with two terminals going perpendicularly into them	Energy storage, digital memory, power condi oning
Inductors	A series of looped coils	Filters, sensors, transformers, motors, energy storage
Switches	Two terminals with a connec on line	Electrical contact, on-o opera ons
Power source	DC or AC Voltage Sources Ba eries	Providing power/energy
Diode	A triangle pushed against a line	Radio demodula on, power conversion, over- voltage protec on, logic gates, ionizing radia on detectors, temperature measurements, waveform Clipper and Clamper
Transistor	<ul> <li>BJTs have three terminals, collector (C), emi er (E) and a base (B)</li> <li>MOSFETs have three terminals, source (S), drain (D) and gate (G)</li> </ul>	Can be operated as a switch and as an amplifier It can be used to make IC's.
Integrated Circuits	A rectangle, with pins connected to the sides	Cars (automo ve controls), televisions, computers, microwaves, portable devices such as laptops, MP3, play sta ons, cameras, cellular phones to ship equipment, aero planes, space cra 's

Fig 2.2.2: Symbol and applica ons of components

- Further explain to them how to read wiring diagrams. Tell them that there is name iden fier of the symbols which make them easy to use and recall again and again. The name iden fier is generally the first alphabet of the component such as name iden fier of Resistor is R, Capacitor is C. In addi on, tell them that they are some excep onal cases like Crystals and oscillators, the name iden fier for them is Y.
- Further tell them that some of the components on a circuit board have one posi ve end and one nega ve end which defines its polarity.

• Lastly, explain to them some examples of reading electrical/electronic diagrams.

### UNIT 2.3: Wiring Specifica ons

# - UnitObjec ves 🧖

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

- List the types of wires
- Explain sizing of wires
- Iden fy the colour coding of wires

### - Say 🔎

- Tell the par cipants that an electronic equipment uses various types of electronic cables such as a single wire covered with insula on.
- Tell them that wire specifica ons include types of wires used, wire size, colour coding and wire markings.
- Tell them that proper selec on of the type of the cable to be used is essen al to save me during the electronics construc on phase of a project and to get op mum performance.
- Also, tell them that some of the important types of wires and cables are as follows:

- o RF coaxial feeder
- o Screened cable
- o Ribbon cable
- o Data cable
- o Connec ngwire

### - Notes for Facilita on

- Tell the par cipants that a connecting wire could be a single wire with insula on, used for point to point connec ons, or many types of connec ng wires could be used for di erent connec ons.
- Inform them that connec ng wires allow an electrical current to travel from one point in a circuit to another. In a basic electronic circuit, the connec ng wire comes from one of the terminals of a power source such as a ba ery.
- In addi on, tell them that connec ng wires would only perform their desired func onality when the circuit is complete or closed.
- Explain to them that radio frequency (RF) cables as RF coaxial feeder is made up of concentric circular layers.
- Then explain to them the various advantages of RF cables such as RF coaxial cable e ciently carries radio frequency signals from one place to another with a minimum amount of loss and they are convenient, user-friendly and immune to the changes in the environment.
- Tell them that the most common type of antenna feeder used today is a coaxial feeder because it o ers the advantage of convenience of use along with being able to provide a good level of performance.

• Then explain to them the internal structure of the coaxial cable by the help of the following diagram:



Fig 2 3.1: Internal structure of co-axial cable

- Further tell them that screened cables consist of one or more wires enclosed in a jacket, which acts as a screen to safeguard it from stray radia on.
- Inform them that screened cables reduces electrical noise and electromagne c interface
  e ects. The shield of screened cables is free from any disturbances as it is covered by
  braided standard of copper or layer of conduc ng polymer and this shield is also covered
  by a jacket. This shield acts as a hurdle which is used to reduce electrical noise which
  a ects the signals and to reduce electromagne c radia on.
- Explain to them that data cables are used to transfer data from one point to another keeping minimum data errors at the receiving end.
- Inform them that a data cable allows only baseband binary transmissions (0 or 1) from a transmi er to a receiver.
- In addi on, explain to them various types of data cables such as Ethernet cables, serial cable, USB (Universal Serial Bus) cable and so on, and explain these using the following points:
  - Ethernet cable: An Ethernet cable is one of the most popular forms of network cable used in wired networks, such as in o ces to join computers in a network.
  - Serial cable: A serial cable is a cable used to transfer informa on between two devices using a serial communica on protocol.
  - USB (Universal Serial Bus) cable: USB cable assemblies are some of the most popular cable types available, used mostly to connect computers to peripheral devices such as cameras, camcorders, printers, scanners, and so on.

## Ask ask

- · Ask them to list the factors that they must keep in mind while selec ng a wire.
- Enquire from them if they know how to find out the required size of the wire that can handle the load of a circuit.

- Ask them if they know what American Wire Gauge (AWG) is. If you get a valid answer, then ask them to define AWG.
- Ask them to name the factors to be considered to determine the wire size.
- Enquire from them if they know about the di erent colour codes of wire.
- Further ask them if they have no ced the marking done on the wire.

### - Notes for Facilita on 🛽

- Inform the par cipants before making any wired connec ons that it is important to know the type, colour and size of the wire to be used for making the connec on so that it can handle the load of the circuit.
- Tell them that to determine the correct size of wire, the AWG system is used. In addi on, tell them AWG is a standard set of non-ferrous wire conductor sizes.
- Also, tell them that each panel has its own unique wire size and ampacity-carrying capability. Based on the requirement of the control panel, correct wires should be used.
- Further explain to them the factors that determine the size of the wire such as

#### Voltage Source

• A voltage source should be such that it maintains a fixed voltage drop across the terminals of the wires.

### Number of phases

• Wire can be single phase, two phase, three phase or four phase depending on the requirement of the circuit.

#### **Current Drawn**

• The number of amperes drawn by the wire can be obtained from the manufacturer of the wire.

### Voltage Drop

- Voltage drop depicts how energy is supplied of a voltage source that is reduced as electric current moves through the passive elements of an electrical circuit.
- Voltage drop of wire can be calculated by the following formula: Vdrop (V) = Iwire (A)  $\,\times\,$  Rwire(  $\,$  )

Fig 2.3.2 Factors determining size of the wire

- Tell them the formula, which is based on Ohm's law, for calcula ng the wire size. In addi on, you can give a simple numerical based on this formula.
- Then explain to them the table that describes the AWG standards of wire size.
- Further explain to them the importance of colour coding of wires by saying that it represents the purpose for which the wire will be used.
- In addi on, explain to them the table that represents the colour code and the colour of the wire.
- Inform them that in an electronic equipment wire markings are generally colour coded to indicate the nega ve and posi ve polarity. It is essen al to connect the posi ve and nega ve wires to the posi ve and nega ve terminals respec vely. If the wires are crossed in stereo components, such as loud speakers, it could result in a short circuit due to reversal of audio signals.
- Ac vity handling strategy:
  - o Ac vity: Iden fica on Game
  - o Draw/show the given circuit diagram.
  - Randomly choose any par cipant to iden fy and label one or two components of the circuit.
  - o Reveal the correct answer at the end of the game.
- Ac vity handling strategy:
  - o Ac vity: Iden fica on Game
  - o Draw/show the given circuit diagram.
  - Randomly choose any par cipant to iden fy and label one or two components of the circuit.
  - o Reveal the correct answer at the end of the game.
- Ac vity handling strategy:
  - o Ac vity: Iden fica on Game
  - o Draw/show the given circuit diagram.
  - Randomly choose any par cipant to iden fy and label one or two components of the circuit.
  - o Reveal the correct answer at the end of the game.
- Ac vity handling strategy:
  - o Ac vity: Match the following.
  - o Draw the given table on the white/black board.
  - o Ask any par cipant randomly, to match the symbol with its name

Facilitator Guide

#### UNIT 2.4: Wiring Prepara on

## - Unit Objec ves 🧖

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

- List wire prepara on methods
- · Iden fy di erent tools for insula on removal

Ask

- · Ask the par cipants if they know what wire insula on is.
- Ask them to list the tools used in the removal of wire insula on.
- Enquire from them if they know the steps involved in stripping a wire.
- Ask them to name the tool they use for cu ng a wire.

#### - Notes for Facilita on 🖃

- Inform the par cipants that it is necessary to prepare the wire properly as proper prepara on of wires ensures quality and dependability.
- Tell them that wire prepara on is done through cu ng, stripping, sli ng, marking and crimping and it is based on the electrical connec on, length accuracy, cross-sec onal width and amperage.
- Further explain to them each step involved in wire prepara on such as
  - o Insula on Removal:

Insula on removal is one of the basic parts of wire prepara on. There are several techniques that are used to remove the insula on of wires.

Some best prac ces to be followed while stripping the wire such as size of the wire should match the correct notch of the stripper. Stripping is impossible if the notch of the stripper is too large.

Explain to them hand operated strippers and its types, adjustable and non-adjustable.

Then tell them about the steps involved in stripping.

Lastly explain to them the damages that may be caused at the me of removing the insula on of wires.

Fig 2.4.1: Insula on removal



#### UNIT 2.5: Wire Connec ons

## - Unit Objec ves 🧖

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

- · Iden fy di erent kinds of wire joints, wiring systems and methods of wiring
- Explain the method of soldering
- Iden fy the method of joining two wires

#### · Say ᅝ

- Tell the par cipants that the co1mponents of a control panel are connected through wire connec ons. The flow of current is dependent on the type of connec on.
- To establish a connec on, di erent types of joints are used. Soldering technique is used to make the joint firmer.
- Inform them that soldering is also used in plumbing and metalwork from flashing to jewellery. In addi on, tell them electronic soldering connects electrical wiring and electronic componen1ts to printed circuit boards (PCBs).
- The joints provide the wires with electrical insula on because joints are made using connectors, heat shrink tubes or electric tape which acts as an insulator to electricity.

## Notes for Facilita on

- Inform the par cipants that to connect cables of di erent voltages such as low, medium or high, they have to use cable joints.
- Tell them that the joints provide the wire strength and mechanical protec on. Also, tell them about the various ways of making an electrical connec on such as crimping, using mechanical connectors and soldering.
- Further explain to them the chart that depicts di erent types of joints and their applica ons.

## Ask ask

- Ask the par cipants if they have seen soldering iron.
- Ask them if they know what a solder and flux is.

#### - Notes for Facilita on 🖃

- Inform the par cipants that soldering is a process of joining two or more objects, which are usually metals, by mel ng and pu ng a filler metal called solder, into the joint.
- Inform them that soldering iron is used to heat up the joint to such an extent that the solder is melted, and then the melted solder flows around the joint making it secured and

protected.

- Define solder to them as a metal alloy that is used to form a permanent bond between the metal pieces, which are to be joined using soldering.
- Further tell them that the func on of flux is to facilitate the process of soldering. Also, tell them in soldering, flux is used to prevent oxida on of the materials used in it. It helps the oxides to dissolve on the metal surface, which as a result prevents oxida on by pu ng a coat on the hot surface.
- Explain to them the various steps involved in soldering along with some ps such as when the soldering iron gets hot and becomes dirty because of oxidiza on, clean the p with a wet sponge un 1 the p shines and while soldering, they should not touch the iron p.
- Inform the par cipants that cleat wiring system is not used nowadays as it is suitable for domes c purposes (since it is a temporary wiring). This was specially used only temporary army campus or fes val related stalls (pandals).
- Tell them that deat wiring system comprises of ordinary PVC insulated wires or weather proof sheathed cable that are braided and held on the ceilings with the help of porcelain deats.
- Further inform them that casing and capping wiring systems are not in use these days.
- These systems used PVC or other approved insulated cables.
- Explain to them ba en wiring system. Tell them that lead or metal sheathed wiring system includes those conductors which are insulated and covered with outer sheath made of lead aluminium alloy.
- Further inform them that the metal sheath ensures protec on to the cables from moisture, atmospheric corrosion and mechanical damage.
- Explain to them conduit wiring system and its types.
- Further tell them that a cable tray system provides support to the insulated cables, which are used in power distribu on and communica on.
- In addi on, also tell them cable trays are alternal ve to the conduit systems. They are used where frequent changes to the exising wiring system are required, as new cables are installed by laying them in a tray and not by pulling through a pipe.
- For more informa on on cable tray wiring system, visit the following link: h p://www.cooperindustries.com/content/dam/public/bline/Resources/Library/catalogs /cable\_tray\_systems/all\_products/CTManual.pdf

## Ask

- Enquire them do they know the electrical wiring methods. If you get relevant answers ask them to give some informa on, as much as they know, about:
  - o Joint Box or Tee or Join ng System
  - o Loop-in or Looping System

– Notes for Facilita on 🖳 –
<ul> <li>Inform the par cipants that electrical wiring can be done by using two methods, Joint Box or Tee or Join ng System and Loop-in or Looping System.</li> <li>Further explain to them both the methods.</li> </ul>
<ul> <li>In addi on, tell them some advantages and disadvantages of the systems with the help of the following points:</li> </ul>
<ul> <li>Joint Box or Tee or Join ng System: It doesn't require too much cable. It is, therefore, cheaper but it is only a temporary installa on.</li> </ul>
<ul> <li>Looping System: This system has easy fault loca on as the points are easily accessible. However, more length of wire or cable is needed and that results in greater voltage drop and copper losses.</li> </ul>
Ac vity handling strategy for preparing a married joint:
<ul> <li>Tell the par cipants that there are numerous types of splice kits and wire connectors available. These kits are used to properly solder wires which has the ability to weatherproof the new splice. This helps in saving me and money.</li> </ul>
<ul> <li>This ac vity will guide them to learn the proper technique to splice wires and create a weatherproof seal to protect outdoor electronics. For individuals who are new to soldering, wire splicing is a basic soldering skill that will definitely come handy over me.</li> </ul>
<ul> <li>Make two groups ask one group to perform four steps and ask the other to perform the remaining of the following steps to get the end product.</li> </ul>
1. Take your wire stripper and strip 3/4 of an inch of the outer insula on from both of the wires you are splicing together.
2 Take a piece of 8mm shrink tube about 3 inches long, and slide it down one side of the wire bundle.
<ol> <li>Once wires are stripped, take a 1/2 inches piece of 3mm Heat Shrink Tubing and place one sec on over each individual wire.</li> </ol>
<ol> <li>You can now take the stripped wire ends and wrap them together like in the figure below.</li> </ol>
5. Add a small amount of liquid flux to the bare wire.
6. With a hot soldering iron, use the side (not the p) to heat the wire and melt the flux. The heated flux will evenly pull the melted solder into the wire.
7. Once cooled slide your 3mm shrink tube over the wire to cover the newly soldered

8. Using your heat gun, shrink the tubing, now con nue to solder the remaining wires, shrinking each one as you go.

#### UNIT 2.6: Earthing

### - UnitObjec ves 🦉

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

• Explain earthing principles and methods

## Ask (ask)

- · Ask the par cipants if they know what is earthing.
- · Ask them to tell the importance of earthing.

Sav 🦻

Tell the par cipants that the principles of earthing are developed to ensure:

Safety of persons

Protec on of equipment

## Notes for Facilita on 🗐

Explain to the par cipants the earthing principles which are as follows:

- 4-pin power plug and 3-pin plug socket earth pin must be earthed e ciently and permanently.
- All metal casing that are used to protect the electric supply line or any apparatus should be connected to the earth.
- The frame or the metallic part of the electrical system must be earthed using two separate and dis nct connec ons with the earth.
- The middle conductors, in a dc 3-wire system, must be earthed at the genera ng sta on.
- Stay wires, which are used for overhead lines, must be earthed in such a way that it connects at least one strand to the earth wire.
- Inform the par cipants that the complete earthing system consists of:
  - o Earth wire or Earth Con nuity Conductor
  - o Earth Electrode
  - o Earthing Lead
- Further briefly explain each component to them.

#### Say 🤄

- Tell the par cipants that earthing can be of two types:
  - o Equipment grounding
  - o System grounding

- Tell them that in equipment grounding, all the metal parts that are not carrying current, are interconnected and then they are connected to the earth.
- Tell them that system grounding is used to protect the electrical system from any kind of superimposed voltages that are caused by accidental contact with systems which have higher voltage and lightning.

#### - Notes for Facilita on 🖃

- Briefly explain equipment grounding along with its importance.
- Also, tell them that according to Na onal Electric Code (NEC), the resistance of the ground rod i.e. grounding electrode must be less than 25 ohms. The ground resistance has the ability to restrict the fault path current below the circuit breaker trip point.
- In addi on, also explain to them that in the figure, the grounding conductor of the same appliance is connected to the chassis.

#### UNIT 2.7: Earthing

## - Unit Objec ves 🧖

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

Describe wiring of basic circuits

## Ask 🔍

- · Ask the par cipants if they know what a circuit diagram is.
- Randomly choose the par cipants and ask them about the circuit diagrams of the following:
  - o A lamp connected to a switch and ba ery
  - o Two led connected in series with the resistor
  - o Three resistors connected in series with a ba ery

#### - Explain 🖞

- Explain to the par cipants some more basic circuits other than the ones provided in the handbook:
  - DC Ligh ng Circuit: A DC supply is used for a small LED that has two terminals namely anode and cathode. The anode is posive, and cathode is negave. A lamp is used as a load, that has two terminals such as posive and negave. The posive terminals of the lamp are connected to the anode terminal of the basery and the negave terminal of the basery is connected to the negave terminal of the basery. A switch is connected in between wire to give a supply DC voltage to the LED bulb.
  - Rain Alarm Circuit: The components required to make this circuit are cables, 10K and 330K resistors, BC548 and BC 558 transistors, 3V ba ery, 01mf capacitor and speaker.
  - Simple Temperature Monitor Circuit: This circuit gives an indica on using an LED when the ba ery voltage falls below 9 volts. This circuit is an ideal to monitor the level of charge in 12V small ba eries. These ba eries are used in burglar alarm systems and portable devices.



- 8. Connect a resistor to the remaining wire of the third contact.
- 9. Connect a wire with the other terminal of the resistor.
- 10. Connect this wire to the z1 terminal of the Digital Signal Controller (DSC) control panel.
- 11. Put the second wire that is the remaining wire of the first contact in the common terminal.

Wiring of biometric fingerprint door access for a corporate o ce:



- 1. Iden fica on:
  - · Iden fy the posi ve and nega ve terminals of the power supply.
  - On the biometric reader iden fy the posi ve, nega ve, common and normally closed terminals.
- 2. Connec ons:
  - Connect the posi ve and nega ve terminals of the biometric reader to the posi ve and nega ve terminal of the power supply.
  - Connect the common terminal from the biometric reader to the nega ve terminal of the power supply.
  - Connect the posi ve and nega ve terminals of the mo on sensor to the posi ve and nega ve terminals of the power supply.
  - Connect the common terminal from the mo on sensor to the "normally dose" terminal of biometric reader.
  - Connect the cable harness to the mo on sensor.
  - Connect the "normally close" terminal from the mo on sensor to the common terminal of the open bu on.
  - Connect an extra piece of wire to the "normally close" terminal of the open bu on.
  - Connect an extra piece of wire to the nega ve terminal of the maglock.
  - Bring an extra piece of wire to the posi ve terminal of the maglock.
  - Connect the extra piece of wire from the push bu on normally close to the nega ve wire coming from the maglock.
  - Connect the wire coming from the posi ve terminal of the maglock to the posi ve wire of the power supply.
- 3. Plug in the power supply.

Wiring of an electrical fence for an animal farm:

Suggested Solu on:

- 1. Take a fence energizer.
- 2 Connect the live wire of the electric fence using insulated jumper wires.
- 3. Connect the energizer fence terminal (posi ve) to the insulated jumper wires.
- 4. Connect the energizer earth terminal (nega ve) to galvanized metal stakes driven into the ground.
- 5. Connect the ground wire of the fencing to the grounding rod.
- 6. Connect the energizer to the main power supply.

Adding of a 220v ac circuit to breaker box:



- 1. Remove the face plate from the breaker box.
- 2 Turn o the main breaker.
- 3. Punch the knockout down from the top of the breaker.
- 4. Put a damp in the knock out for wires.
- 5. Screw the damp.

6. Put the wire through the damp.

7. Run the cable into the breaker box.

- 8. Ground the bare copper wire.
- 9. Put the red and black wire to both the terminals of the breaker.

10. Install the breaker into the box.

- 11. Wire the other end of the circuit.
- 12. Check the circuit using the tester.
- 13. A  $\,$  ach the cover to the breaker box.
- 14. Turn on the power line.

Grounding of an electrical panel of home circuit:



- 1. Punch the knock out from the panel.
- 2 Put the romex connector on the punched knockout.
- 3. Insert the home run wires through the connector.
- 4. Insert the aluminium service entrance cable into the panel.
- 5. Strip the insula on of the cable.
- 6. Connect the aluminium wire of the cable to the grounding bar.
- 7. Connect the ground wires from the home run wires to the grounding bar.
- 8. Tightly connect all the wires to avoid any short circuit.



7. Switch on the power supply.







Transforming the skill landscape



# 3. Wiring a Control Panel

Unit 3.1 – Objec ve of the Module Unit 3.2 – General Procedures for Wiring a Control Panel; Unit 3.3 – Wiring an Electrical Control Panel



## Key Learning Outcomes 🛛 🖗

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

- List the general procedures for wiring a control panel
- Demonstrate wiring of an electrical control panel

#### UNIT 3.1: Objec ve of the Module

## - Unit Objec ves 🮯

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

- Demonstrate the wiring of a control panel
- Describe the sizing and stripping of wires
- Explain panel layout considera ons such as space op miza on and spacing between wireway and wired devices
- Demonstrate how to install the feeder pipe and branch circuit wires in a panel

## - Ask (ask)

- Ask the par cipants to tell what points they think they should keep in mind while wiring any electrical/electronic circuit or panel.
- Ask them to tell how they would iden fy the correct size of the wire to be used.
- Ask them to recall what wire stripping is.
- Ask them if they know anything about panel layout considera ons.
- Enquire whether they know about feeder pipe and branch circuit.
- Ask them if they can add a new circuit to the panel.

## Notes for Facilita on 🗐

- Call the par cipant to list their expecta ons from the course on the whiteboard/blackboard to enable a discussion.
- Introduce the topics binding to the list of expecta ons wri en on the whiteboard/blackboard.



#### Unit 3.2: General Procedures for Wiring a Control Panel

## - UnitObjec ve 🖾

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

- List the good prac ces of wiring
- Describe the sizing and stripping of wires
- Explain the panel layout considera ons
- Ask ask
  - Start the session by asking the par cipants if they know what are sensi ve components. If you get relevant answer, ask them to list some ways handle them.
  - Ask if they can show what space should be kept in between wired devices and wireways.
  - Ask them to tell what a wire duct is.
  - Ask if they know how to ensure that the chosen wire size is correct or not.

## - Notes for Facilita on 🗐

- Tell the par cipants that wiring is their core func onal area, so they need to have perfec on in it.
- Further explain good wiring prac ces to them, such as follow the wiring diagram, use stranded wire as specified in the wiring diagram and keep minimum space between wired devices and wireway.
- Further inform them that each panel has its own unique wire size and ampacity-carrying capability. Based on these requirements of a control panel, correct wires should be used.
- Tell them that the choice of a wire to be used in wiring di erent components of a control panel depends upon the wire capacity, wire gauge and what the wire will feed.
- In addi on, explain to them that cables are coated with insulated materials. To join connectors or to prepare cables for se ng up a connec on, they need to strip the insula on of the cables.
- Also, tell them that they have to keep in mind about the safety of wires and cables during wiring the control panel.
- In addi on, explain to them the di erent ways of securing the cables such as:
  - Suppor ng the cables/wires in such a way that they are not exposed to any mechanical strain.
  - o Keeping the termina ons free from any undue mechanical strain.
  - Suppor ng the cables/wire by appropriate means at proper intervals to keep the cables secured from any damage because of their own weight and so on.

# Say 🦻

• Tell the par cipants that the main focus while designing a layout for a control panel should be on the space optimiza on and the spacing between wireway and wired devices.

#### - Notes for Facilita on

- Explain to them that space op miza on is the process of e cient and wise use of space.
   Further explain to them some points that they should keep in mind to achieve space op miza on such as pu ng PLC I/O racks in the specified space of the wiring duct so that high density wires can be easily connected to them, rou ng all wires properly and to keep the various voltages separated.
- In addi on, tell them some more key points of panel layout such as:

- o Use of shielded cables for low powered signals to ensure less interference.
- Use of panels that are conducive in nature such as steel. It over sprotecing against electromagne circadia on.
- o Use of specified connectors and devices to secure the components in use.
- Use of di erent raceways for di erent types of cables and precau ons to be taken while using high and low-power devices in the panel to avoid malfunc on.



#### Unit 3.3: Wiring an Electrical Control Panel

## - UnitObjec ve 🤘

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

- Install the feeder pipe
- Install the branch circuit wires
- Add a new circuit to the panel

# Say 🖻

- Tell the par cipants that the electrical control panel wiring should be well organized otherwise it can be unsafe or hazardous. Some common hazards are electric shock causing injury or death, arcing, explosion or fire causing burns, fire resul ng from an electrical fault and so on.
- Tell them that it is important that wiring should be held together neatly using wire esto ensure that everything such wires and components are in an organized and neat order.
- Tell them that it is advisable for everything to be ghtly connected and there should be a logical order for the wire connec ons.

#### - Notes for Facilita on

- Explain to them the steps for wiring an electrical control panel and to add a new circuit to the panel.
- Further explain to them some dos and don'ts of wiring the control panel such as:
  - o Do not connect wires outside the panel box.
  - o Do not cut wires too short, as it makes wire connec ons di cult.
  - o Do not leave plas c-sheathed cable unprotected.
  - Use a metal box extension on a plas c box. Connect the metal extension to the ground wire in the box using a grounding dip and a short piece of wire.
  - o Cables must be connected to metal boxes with an approved cable damp.
  - o Do not use too many wires as they can cause overhea ng, short-circui ng and fire.
  - Adding a new circuit can be risky, so it is mandatory to follow step-by-step instruc ons and safety ps.



- 8. Insert the wire through the knock out.
- 9. Repeat the steps and install another wire in the control box.
- 10. Keep the wire which is coming from the switch from le conduit.
- 11. Keep the power wire going to the pump on the right.
- 12. Strip the insulator o the all the four wires that are green, red, yellow and black about  $\frac{1}{2}$  inch.
- 13. Strip the ends of wire coming from the switch.
- 14. Install terminal block inside the control box.
- 15. Connect the wire coming from the switch to L1, L2 and power pins of the terminal block.
- 16. Connect the red, yellow and black wire of the power wire to the red, yellow and black pin of the terminal block respec vely.
- 17. Install the cover on the control box.
- 18. Tighten all the screws.



- 1. Insert the aluminium service entrance cable from the top of the electrical panel.
- 2 Strip the insulator o the entrance cable using the u lity knife.
- 3. Put the two black hot wires each 120V on side loads.
- 4. Connect the aluminium wire to the grounding bar.
- 5. Put the neutral wire in the neutral pin.
- 6. Punch the knockout down.
- 7. A ach romex connectors to the open knockouts.
- 8. Use the romex stripper to strip the home runs.
- 9. Insert the home run wire (Wire coming from di erent rooms of the o ce) through the romex connector.
- 10. Label all the cables using label and marker.
- 11. Connect all the grounding wires to grounding bar.
- 12. Connect all the neutral of the home run to the neutral bar.
- 13. Put the individual breakers in the bar for respec ve home run wires.
- 14. Connect the home run to the breaker.
- 15. Turn on the power.



- 1. Take a two -conductor cable with black and red wire.
- 2 Strip the ends of the wire.
- 3. Connect the black wire to the nega ve of the bell pin of the DSC panel.
- 4. Connect the red wire to the posi ve of the bell pin of the DSC panel.
- 5. Connect the red and black wire with nega ve and posi ve terminal of the relay respec vely.
- 6. Take a cable with red and black wire and put the wire in open and common terminal of the relay.
- 7. Put the wire to the Z1 and Z2 terminal of the voice dialler.
- 8. Take another cable with two wire.
- 9. Insert one wire in the auxiliary posi ve line of the DSC circuit.
- 10. Insert the second in the auxiliary nega ve line of the DSC circuit.
- 11. Connect the posi ve of the DSC circuit to the posi ve supply terminal of the voice dialler and nega ve to the nega ve.
- 12. Connect the ba ery to the DSC panel.



- Connect the nega ve of solar panel to posi ve of other solar panel to make it 24 Volt panel.
- Connect the remaining two terminals with the charger controller.
- Between charger controller and the panel connect a 30-amp fuse.
- 2. Similarly, take the remaining two 12 Volt 220-wa solar panel(s) and connect them to charger controller. Repeat steps 1a, 1b and 1c.
- 3. Connect twelve 6V ba eries in series to make it three 24 V power connec on.
- 4. Connect the output of the charger controller to the ba ery input.
- 5. Connect the posi ve of the ba ery to a 150 amp or 200-amp fuse.
- 6. Connect nega ve terminal of the ba ery to a 24-volt inverter.
- 7. Connect the 24V ba ery tenders to the ba eries.
- 8. Plug in the ba ery tender to the regular AC supply.



- 1. Take a four -conductor wire cable and strip both the ends of all wires.
- 2. Connect two wires to the nega ve and posi ve terminals of the smoke detector.
- 3. Connect the third wire to the fi h terminal of the smoke detector.
- 4. Take a 5.6k resistor and put its one end in the 6<sup>th</sup> terminal of the smoke detector and other in the last terminal i.e. 8<sup>th</sup> terminal.
- 5. Put the fourth wire of the cable in the 7<sup>th</sup> terminal.
- 6. Insert the posi ve wire from the smoke detector to the auxiliary posi ve line of the DSC circuit.
- 7. Insert the nega ve wire to the PGM of the DSC circuit.
- 8. Connect the third wire to Z1 of the DSC circuit.
- 9. Connect the fourth wire to the common terminal next to the Z1 terminal.
- 10. Connect the alarm to the bell circuit.
- 11. Connect the DSC to the power supply.









Transforming the skill landscape



# 4. Electromechanical Assemblies and Cabling

Unit 4.1 – Objec ve of the Module Unit 4.2 – Electromechanical Assembly Unit 4.3 – Cabling



## Key Learning Outcomes 🦉

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

- Describe electromechanical assemblies
- List wiring instruc ons and guidelines for the assemblies
- Describe the panel assembly process
- Iden fy the labelling methods for the assemblies
- Iden fy the hazards associated with an assembly process
- Describe cabling
- Recognize di erent cable handling strategies
- Define colour coding of cables

#### UNIT 4.1: Objec ve of the Module

## - Unit Objec ves 🧖

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

- Explain wiring instruc ons and guidelines for the assemblies
- Describe the panel assembly process and iden fy the hazards associated with it
- Iden fy the di erent labelling methods of assemblies
- Explain basic concepts of C-cabling
- Demonstrate di erent cable handling strategies and colour coding of cables

Ask ask

- Ask the par cipants to tell what they understand by the term electromechanical.
- If you get relevant answers, ask them to give some examples of electromechanical devices.
- Ask if anybody knows about electromechanical assemblies.
- Ask them if they know about colour coding of cables.

#### - Notes for Facilita on

- Ini ate the session with the par cipants, with a discussion about the objec ves of the course.
- You could make the session interac ve by asking the par cipants to share their expecta ons from the course on the whiteboard/blackboard.
- Introduce the topics to be covered and give some informa on about them.
- Give the par cipants a general idea about what will be covered in the course.

#### Facilitator Guide

#### UNIT 4.2: Electromechanical Assembly

## - Unit Objec ve 🦉

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

- Define electromechanical assemblies
- Describe the components of electromechanical assemblies
- · Iden fy di erent types of electromechanical assemblies
- · List the wiring instruc ons and the guidelines for wiring assemblies
- Explain working with a panel assembly
- · Iden fy the labelling methods for a control panel and the assemblies
- · Iden fy the hazards associated with an assembly process
- Recognize the methods used to avoid the hazards associated with an assembly process

Ask (ask)

- Start the session by asking the par cipants if they know what electromechanical assembly is.
- Ask them if they can tell about the components of electromechanical assemblies.

Explain

- Electromechanical assemblies make use of electrical and mechanical components to perform a various opera on, such as, controlling systems having various switches, genera ng power using electric motors and performing high power mechanical opera ons. With the advent of integrated electronic circuits, many func ons associated with electromechanical assemblies are performed by them. Assemblies such as, control systems, AC/DC power distribu on and some computer interfaces, involve complex wiring and component integra on which at mes is a lengthy process so these types of assemblies need highly trained personnel as they need to perform, hole work to surface moun ng, to soldering and circuit layout. Hence, a wireman needs to understand the job well.
- Electromechanical assemblies by telling them that the term electromechanical indicates conversion of the electrical signal to a mechanical movement and vice versa. An electromechanical assembly combines both electrical and mechanical components and some mes electronic components also.
- Components of electromechanical assemblies are relay, switch, contactor, motor, generator, transformer, solenoid, PLC, diode, resistor, capacitor, transistor and so on.
  - Relay: It is used where it is important to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.
  - o Switches: Switches are designed to handle a wide range of voltages and currents.
  - Contractors: Contactors are used to control electric motors, ligh ng, hea ng, capacitor banks, thermal evaporators, and other electrical loads.

- Transformers: They are necessary for the transmission, distribution, and u liza on of AC electrical energy.
- Solenoid: A solenoid is a type of electromagnet when the purpose is to generate a controlled magnetietd.

#### - Notes for Facilita on

- Tell the par cipants that electromechanical assembly is the process of assembling electromechanical components such as relays and solenoids a together. Inform them that electromechanical assemblies can range from simple to complex.
- Explain to them that most of the assemblies are formed by making wire and cable interconnec on between boards and sub-assemblies, which can be easily done by cable forms or point-to-point wiring method. Electro-mechanical assembly not only includes wiring of switch and instruments/devices, but also of control cabinets.
- In addi on, also tell them that customised components of electromechanical component assembly include components such as power supply units, wiring harnesses, control panel and distributor boxes.
- Give them an example of an electromechanical assembly by telling them that an electric motor and a gearbox is an electromechanical assembly that provides rotary actua on to a system. The gearbox is an assembly of a number of gears that are placed inside a frame or casing. The gears together provide a required torque and speed as output. A gearbox helps to match the power input obtained from a motor with high speed and low torque to the output required.
- Further explain them various components of electromechanical assembly such as relay, switch, contactor, motor, generator, transformer, solenoid, PLC, diode, resistor, capacitor and transistor.
- Lastly, tell them as a best prac ce prior to assembling process, they should:
  - Have knowledge of wiring, crimping, wire harnessing, and layout of mul -component systems.
  - Have hands-on knowledge of various tools such as pliers, crimpers, strippers and so on.
  - Have good soldering skills for small PCB based assemblies.
  - Be able to understand basic drawings.
  - o Know how to handle ESD (Electrosta c Discharge).

#### Say S

- Tell the par cipants that they have learned what electromechanical assembly is, now they have to study its types.
- Tell them that Electromechanical Assemblies are of following four types:
  - o Cabinet Assembly
  - o Bucket Assembly

- o Door/ShelfAssembly
- o Cable Assembly
- Tell them these assemblies di er in their layouts as the requirement of these can vary from a box to a panel to sub assembly and so on. In addi on, the area provided for the assemblies may di er hence an appropriate assembly layout needs to be selected.

#### - Notes for Facilita on

- Tell about the four types of electromechanical assemblies to the par cipants.
- · Further explain to them about each type of assembly.
- Make them understand cabinet assembly by taking an example of wall cabinet assembly.
   Following are the steps that needs to be followed in the cabinet assembly process of wall cabinet assembly:
  - o Step 1: Assemble the back panel
  - o Step 2: Assemble the side panel
  - o Step 3: Assemble beam and bo om
  - o Step 4: Assemble the top
  - o Step 5: Assemble the bo om self
  - o Step 6: Assemble the top self
  - o Step 7: Assemble the unit to be mounted on it
  - o Step 8: Assemble the door
- For more informa on, visit the link:
  - h p://www.sanduskycabinets.com/docs/62\_instruc ons.pdf
- In addi on, make them understand bucket assembly by taking an example of Rodent Operant (RO) Bucket. Following are the steps that needs to be followed in the bucket assembly process of RO bucket assembly:
  - o Drill the holes in the bucket
  - o Assemble the nose poke and drinking well
  - o Mount the solenoid valve
  - o Assemble the control panel
  - o Wire up the control panel and solenoid
- For more informa on, visit the link:
  - h ps://www.niddk.nih.gov/research-funding/at-niddk/labs-branches/diabetesendocrinology-and-obesity-branch/ea ng-addic on-sec on/rodent-operantbucket/Documents/ROBucket%20construc on%20instruc ons.pdf
- Further explain to the par cipants the steps that needs to be followed in the cable assembly process:
  - o Cut the wires to the desired length using an appropriate wire-cu ng tool.
  - o Print the wires by a special machine during the cu ng process.
  - o Strip the ends of the wires.
  - o Assemble the cables and damp them together on an assembly board.

• Cable harnesses con nue to be made with hand even though there has been a spurt in automa on due to the di erent processes involved such as rou ng of wires, crimping the terminals onto the wires and inser ng one sleeve into another.

Ask

- Ask them what they understand by term guidelines.
- · Ask them to list some basic instruc ons which they follow while wiring.

#### Notes for Facilita on 🕒

- Tell the par cipants that guidelines are a set of rules or instruc ons that show how to perform a task. Every task has its own guidelines which tell the way in which it needs to be done. Hence, it is important to follow them to perform the task accurately and reduce the risk of accidents.
- Explain to them the best prac ces that should be followed at the me of control panel assembly wiring such as raining of wires and number of wires to be used with the help of following points:
  - Use wires of 600V 90C raining that should be a stranded wire of MTW (Machine Tool Wiring) type.
  - When wiring across a hinged door or panel make the use of U loop type of wiring as long as possible. Also place the sleeve or spiral wrap over the wires running over the hinge between the anchor points.
  - Spacing should be kept in mind between wired devices and wireway. Ideally it should be minimum two inches.
  - Minimize the use of large number of cables or wires. Also as a best prac ce use wire/cable es if wire duct is used to cut o the e ort during troubleshoo ng.
  - Always run the wires in horizontal and ver cal lines and avoid diagonal runs.
     Place Pig tail loops between devices that are spaced such that it makes it easier to remove wiring if the pig tail is added. Consider using High Flex power wires such as "Railroad Wire" or high strand count wire. Train the wire by bending it in the direc on you want it to go or lay in the duct, rather than just trying to lay it in a wire duct and hope it "stays down" in the duct.
  - o Leave some bare wire to allow visual inspec on.
  - All the ground connec ons must be wired with the ground lug. This can be done directly or using a wire in the other ground bus bar. (Although these points are already covered in Mod 3, there the scope was good prac ces of wiring. In this module, the scope is to emphasize these points from assemblies' point of view.)
- In addi on, tell them some more wiring instruc ons such as:
  - The minimum spacing between cables should be strictly adhered to, even for cables routed within control panels.
  - The crossing of cables always should be done at right angles.
  - o If there is insu cient space to maintain the required spacing between the cables,

then they must be routed in separate cable trays.

- o Always screw the cable tray to the uprights of the frame or the cabinet walls.
- o Ground the shields of all cables entering the cabinet at the entry point.
- o Always use threaded glands to the cables that enter the control panel.
- o Do not exceed the given tensile strength of the cables.

Say 🤷

Tell the par cipants that now that you have learned the wiring instruc ons and guidelines, focus on how to work on the panel assembly.

Tell them that the panel assembly process includes se ng up of side panels, integra ng the required components and sub-assemblies on the board and wiring them, pu ng the board with components in the panel and se ng up the wiring according to the wiring diagram.

#### - Notes for Facilita on

Explain to them the prepara on and precau on methods that they should do before the assembly process such as use of shielded cables, specified connectors and cables. In addi on, tell them to take some more precau ons such as:

induir on, ten them to take some more predad ons salent

- o Take o any metal objects from your arms or fingers.
- o Keep your hand completely dry.
- o Work in a cool area.
- o Make sure to control ESD.
- o Handle all parts with care.
- o Do not forcefully remove any component/part if it does not come out easily.
- o Never a empt to remove the power source.
- When inser ng/removing any cables or wires make sure to grasp the wire at the base or head to keep it from breaking.
- Hold the cables and wires from the base or head while pu ng in or removing them to avoid breakage.

Further briefly explain to them all the steps involved in panel assembly process.

#### Ask (ask)

Ask them to define labels.

Ask them whether they have ever no ced tags on the dothes. If yes, what informa on the tags contain.



• Explain to the par cipants some hazards associated with the panel assembly process such as exposure to high electromagne c fields and fires along with their preven ve measures.

#### UNIT 4.3: Cabling

## - Unit Objec ve 🖾

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

- Iden fy the cables and wires to be used in an electrical panel
- Describe cable handling strategies
- Define colour coding of cables

## Say 🤷

- Tell the par cipants that cabling is an important process of the panel assembly. It is the process of preparing cables and se ng up a connec on.
- Tell them that in this unit they are going to study what cabling is, how to select appropriate wires and cables, handling strategies of cables and their colour coding.

## Ask ask

- · Ask them on which criteria they select cables.
- Enquire whether they know about safety codes and standards for cabling.
- Ask them to classify the wires on the basis of their colour.
- Ask them to recall di erent types of cables and their characteris cs.

## - Notes for Facilita on 🗐

- Explain to the par cipants some points which they need to consider while selec ng cables and wires with the help of the following points:
- The factors for raing of wires and cables are:
  - Current: The amount of current that you expect will flow through the wire should be an important criterion for its selec on. The more the current flowing through the wire, the more will be the heat generated, thereby increasing its resistance. This could harm important devices. Maximum rated current usable for di erent gauges of wires are dearly given in the tables published by the wire manufacturers. Selec on of wires should be done as per these tables. It is advisable to purchase a wire that can carry a li le more current than one expects to flow through it.
  - Voltage: Maximum voltage tolerance is also an important considera on while selec ng wires. The quality and thickness of the insula on covering the wire determines the maximum rated voltage. Generally, wiring applica ons don't have the issue of excessive voltage, except high voltage motors and transformers.
  - Temperature: Heat due to high temperature can become an issue for wires irrespec ve of the current flowing through them. There are extremely high temperatures, even more than 300 degrees C, at applica ons such as heavy industry
and aerospace. Wires with special insula on such as ceramic coa ng should be used for such high temperature workings.

- o Frequency: Wire selec on needs the frequency, which is going to be applied to it, to be kept in mind as well. High frequencies can cause a enua on and improper func oning due to the occurrence of "skin e ect". When a conductor receives voltage at a high frequency, the current, instead of being carried evenly through the wire, flows only in its peripheral area. The cross-sec onal area of the wire becomes less, as only the "skin" of the wire works as a conductor. This is the "skin e ect" and can be prevented by using a bunch of smaller wires known as "litz wire", in place of a sole copper wire. An aluminium wire, which shows lesser skin e ect, can also be used to replace the copper wire.
- In addi on to the preceding four technical factors, certain other considera ons are also there, such as cost and size. Complying to regula ons and industry standards is also essen al.
- In addi on, also explain to them other factors such as safety codes and standards for cabling and wiring, colour codes of cables and wires to understand the specifica ons in the wiring diagram and di erent types of cables and their characteris cs.
- Inform them that di erent cable handling strategies include insula on stripping, securing
  of cables and wires, cable rou ng and cable forming or bending. (Though stripping is
  already covered in Modules 2 and 3, there the scope was to make participants aware of
  the terminology. In this module it is important to emphasise this topic again.)
- Tell them that all the cables are coated with insulated materials. Stripping o this insulated material form cables is known as insula on stripping. Further, tell the ways to strip di erent cables such as electric cords, plas c-sheathed cable and coaxial cable.
- Then explain to them that crimping is a method which is used to compress or secure a terminal or contact to a conductor mechanically. Tell them di erent ways of crimping the wires. (Though crimping is already covered in Module 2, there the scope was to introduce crimping. In this module the scope is crimping the cables for assemblies, so it is important to be iterated here again.)
- Further tell them about some best prac ces of cable rou ng.
- In addi on, inform them about bending of cables. Explain to them the given table that represents minimum permissible bending radius of di erent cables.
- Inform them that in the process of cable forming, a number of wires that may be of di erent types and sizes are grouped together to form a single cable. It is similar to cable harnessing.

### Ask (ask)

Randomly select the par cipant to ask the following ques ons based on colour coding of cables.

- Tell the colour of 2 phase live/ac ve wire
- Tell the colour of 2 phase neutral wire
- Tell any two colours of three phase wires

### - Notes for Facilita on 🗐

Tell them the importance of colour coding, further explain to them di erent colour codes of power cables according to IEC 60445 (2010) standards.

Select the following links for more informa on:

- h p://openelectrical.org/wiki/index.php? tle=Cable\_Colour\_Code
- h p://www.allaboutcircuits.com/textbook/reference/chpt -2/wiring-color-codes/
- h p://ecmweb.com/content/wiring-methods-industrial-machinery



- 1. Weather proof enclosure:
  - Mark the lid of weather proof endosure for 2 sockets, controller and neon lights.
  - Embed the components (2 sockets, controller and neon lights) in it.
  - Put the temperature sensor at the base of the enclosure.
- 2 Cut all the cables 8-10cm long (earth, live and neutral) as required.
- 3. Neon lights:
  - A ach 4 speed connectors at one end of 2 live wire, and 2 neutral.
  - Connect the live wire and neutral wire with speed connectors to socket 2 from other end at respec ve terminals and connect the speed connector end to the blue neon light.
  - Follow same for red neon light. Connect to socket 1.
- 4. Earth both the sockets (socket 1 and socket 2), connect them with single terminal block.
- 5. Terminal block
  - Connect the neutral wire from 2<sup>nd</sup> terminal block to neutral terminal of socket 1.
  - Interconnect 1<sup>st</sup> and 3<sup>rd</sup> terminal block with live wire and 3<sup>rd</sup> with 5<sup>th</sup> terminal block.
  - Interconnect 2<sup>nd</sup> and 7<sup>th</sup> terminal block with neutral wire.

- Connect live wire from 6<sup>th</sup> terminal block to live terminal of socket 2
- Connect neutral wire from 7<sup>th</sup> terminal block to neutral terminal of socket 2.
- Connect live wire from 1<sup>st</sup> terminal block to live terminal of main socket.
- Connect neutral wire from 2<sup>nd</sup> terminal block to neutral terminal of main socket.
- 6. Temperature controller
  - Connect the live wire from 1<sup>st</sup> terminal block to 1<sup>st</sup> port of controller and neutral wire from 2<sup>nd</sup> terminal block to 2<sup>nd</sup> port.
  - Connect live wire from 3<sup>rd</sup> terminal block to 5<sup>th</sup> port of controller
  - Connect live wire from 4<sup>th</sup> terminal block to 6<sup>th</sup> port of controller
  - Connect live wire from 5<sup>th</sup> terminal to block 7<sup>th</sup> port of controller
  - Connect live wire from 6<sup>th</sup> terminal block to 8<sup>th</sup> port of controller
- 7. Connect the temperature sensor to 3<sup>rd</sup> and 4<sup>th</sup> port of controller.
- 8. Main switch
  - Connect main live and neutral to 1st terminal block and neutral to 2nd terminal block.
  - Earth the main's wire to single terminal block.
- 9. Club all the components' lid together.

#### Inverter Assembly for a Small O ce:



#### Suggested Solu on:

- 1. Wa hour meter:
  - Connect the phase wire a ached with 220VAC grid to the wa hour meter and connect the neutral wire to the Wa hour meter.
  - Connect the phase wire from the Wa hour meter to the phase terminal of main switch box, and then connect the neutral to neutral terminal.

#### 2. Main Switch:

- Put the MCB in the live wire inside the main switch box.
- Connect the phase wire to the switch box containing all the ports (load).
- 3. Connect the ba eries in series making a circuit connec ng nega ve of ba ery B1 to posi ve of ba ery B2 and vice versa for other ba eries, leaving posi ve terminal of B1 and nega ve terminal of B6.

- 4. UPS Connec ons:
  - Connect the posi ve terminal of the ba ery B1 to posi ve terminal of UPS and nega ve terminal of ba ery B6 to nega ve terminal of UPS.
  - Connect the posi ve terminal of UPS output socket to the back-up ports (load).
- 5. AC Socket
  - Connect the phase wire of AC socket to the switch box containing all the ports (load).
  - Connect the neutral of AC socket to the switch box containing all the ports (load).
- 6. Plug-in the UPS in the AC socket.
- 7. Notes: The load can have various inputs such as tube lights, AC, fan, laptop. Depending on the load, the component used will having varying capacity to bear the current flow. The value of ba eries used is directly propor onal to the load in the circuit.

#### Wiring of an Auto Mains Failure system for a Corporate O ce.



- 1. Take an AMF (Auto Mains Failure) controller
- 2 Connect the nega ve of the ba ery to the 2<sup>nd</sup> pin of the supply terminal (JI) of the AMF
- 3. Mount the sub panel near to the main panel.
- 4. Connect the pin 8 and 9 of canbus serial interface and configurable inputs (JF) to SAEJ1939 compatible engine.
- 5. Connect the pin 4, 5 and 6 with resis ve sensors.
- 6. Connect the L1, L2, L3 and N pin of voltage input (JA) to generator.
- 7. Use protec on fuses on the cable from pin L1, L2, L3 and N.
- 8. Connect the R, S, T and N pin of the JA to the main voltage.
- 9. Connect the L1, L2 and L3 pin of the current transformer input (JL) to the input of the current transformers.
- 10. Ground the common terminal of JL.

- 11. Ground the S1 and S2 terminals of Earth Fault Protec on terminal (JP).
- 12. Connect the output terminal (JC) to relays. The Bek3 provides a common supply rail (JC8). It is a dc supply suited for automo ve relays that includes over voltage protec on, short circuit protec on and EMI protec on. You are required to use 90-200 OHM dc coil relays (12 V or 24V according to your engine ba ery).

Wiring of a Sub Panel with the Main panel for a Warehouse



- 1. Take a sub panel.
- 2 Mount the sub panel near to the main panel.
- 3. Punch the top knockout of the sub panel.
- 4. Mount the romex connector to the sub panel to secure 2/Owire.
- 5. Punch the side knockout of the main panel.
- 6. Mount the romex connector to the main panel knockout.
- 7. Insert the wire through the knockout of the sub panel.
- 8. Install a 100Amp double pole breaker in main panel to receive 2/0 wire that will feed sub panel.
- 9. Clean up the main panel wiring.
- 10. Replace the 20Amp standard breaker with combina on AFCI/GFCI breaker.
- 11. Insert the 2/0 wire to the main panel through the side knockout.
- 12. Strip the insulator o the 2/0 wire using the u lity knife.
- 13. Apply an -oxidation compound to aluminium wiring and landing wiring.
- 14. Connect the aluminium wire to the ground strip.
- 15. Connect the landing wire or the neutral wire to the neutral bus.
- 16. Connect the live wires to the 100Amp double pole breaker.



- 1. Assembling the nose poke and drinking well endosure
  - Print out the 3D housing. We used Makerbot PLA material printed at a high resolu on.
  - Plug three JST SH jumper 3-wire assemblies into three photo interrupter boards. Label the signal wire for each "L" (for le ), "C" (for centre), and "R" (for right).
  - Use the nylon screws and hex nuts to secure the photo interrupter boards to the inside of the 3D printed cover and bring the wires to the outside of the cover using the hole in the top le of the housing.
  - Assemble the blunt needle with the two luer lock pieces, and screw together securely in the top hole in the housing.
  - Place the 1/2" piece of plas c under the centre poke.
  - Place the faceplate over the housing, such that the plas c piece is damped in place, and everything is secure
  - Use two 1.5" 6-32 screws and wing nuts to secure the en re apparatus to the inside of the bucket.
  - 2. Moun ng the solenoid valve
    - Using nylon screws and hex nuts, a ach the two broom dips to the two 5/16" holes on the side of the bucket.
    - A ach the syringe to the solenoid valve with a piece of tubing that is approximately 1.5". Leave a piece of tubing (approximately 3") hanging o the output of the solenoid.
    - Mount the syringe and solenoid in the broom dips and a ach the tubing to the hose barb on top of the nose poke apparatus.
- 3. Assembling the side panel electronics
  - Place the Arduino Uno so that the top right and bo om le moun ng holes align with the top two holes in the side panel. Secure the Arduino board in place using the nylon

screws and hex nuts. Place an addi onal hex nut between the bucket and the board at each moun ng point, to allow for a small space between the Arduino and the bucket.

- Fit the SD shield (with stacking headers soldered on) on top of the Arduino and the LCD shield on top of the SD shield.
- Secure the relay module to the bo om two holes in a similar fashion. Orient the relay so that the male pins are on the right side.
- 4. Wiring up the front electronics
  - Place three short pieces of heat shrink tubing around the bundle of 9 wires coming from the nose poke apparatus. Do not heat shrink these yet.
  - Route this bundle of wires underneath the relay module (you may want to unscrew it to do this).
  - If these wires are long enough to reach the LCD keypad shield, place a crimp connector on the end of each.
  - If the wires are not long enough, solder a header wire with a crimp connector on it to increase the length so that it can reach.
  - Plug the power and ground wires from the three nose pokes (6 wires total) into the power distributor on the LCD shield, such that each one has its own power and ground.
  - Plug the remaining 3 wires from the nose poke endosure into the input/output pins at the top of the LCD shield, in the following order:
    - Pin O. Ac ve poke (le )
    - Pin 1: Drinking well (centre)
    - Pin 2: Inac ve poke (right)
  - Use three F/F jumper wires to connect the relay module to the GND and 5V pins on the LCD shield and a ach IN1 on the relay module to Pin 3 on the LCD shield.
- 5. Wiring up the solenoid
  - Cut and strip one red wire approximately 7" long, and one red and one black wire, each approximately 4.5" long.
  - Solder the long red wire, and one of the black wires onto the solenoid, and heat shrink terminals.
  - Screw the long red wire into the bo om port of the relay module, and the short red wire into the port that's 2nd from the bo om.
  - Screw the black wire from the solenoid, and the short red wire into the DC barrel jack.
  - Plug the barrel jack Y adapter into the DC barrel jack and the Arduino power input and a ach to a 9V DC, 650 mA power supply.









Transforming the skill landscape



# 5. Standard and Guidelines for Wire Control Components

Unit 5.1 – Introduc on of the Module Unit 5.2 – General Specifica ons of Electric Work Unit 5.3 – Work and Safety Standards



### Key Learning Outcomes 💡

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

- List general guidelines for electrical work
- Iden fy electrical codes and standards
- Describe government rules and regula ons related to wiring installa on work
- Recognize work norms and safety standards

### UNIT 5.1: Introduc on of the Module

# - Unit Objec ves 🞯

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

- Explain government rules and regula ons related electrical work
- Describe the general guidelines for electrical work and iden fy electrical codes and standards
- Explain work norms and safety standards and iden fy standards to improve work process
- List 5S standards and key elements of Kaizen
- Iden fy safety standards, prac ce preven ve measures and list safety precau ons to be taken while working

Facilitator Guide

#### UNIT 5.1: General Specifica ons of Electric Work

### Unit Objec ve 🤘

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

- Describe the general guidelines for working with electrical components
- Iden fy government rules and regula ons for electrical work
- Work following different electrical codes and standards

### Resources to be Used

• Available objects such as a duster, pen, notebook and so on.

Do <sup>1</sup>

Welcome and greet the par cipants.

Ask

- Ask the par cipants if they know why they must follow standards i.e. rules and regula ons while working.
- Ask the par cipants if they know the full form of the term 'IEC'.
- Ask them if they know the full form of the term 'NEC'.
- Ask them if they can tell the full form of the term 'ISO'.
- Ask them if they can tell the full form of the term 'BS'.

### Explain 🗳

- Explain that it is very important for them to follow standards while working, as these provide protec on. Tell them that:
  - Standards are designed to provide safety to persons, livestock and property and to protect them from electrical shocks and fire hazards.
  - o While doing electrical work, they are exposed to dangers of various kinds.
  - o For this purpose, rules and regula ons are passed by the government.
  - These rules and regula ons set the technical standards that must be followed while doing electrical work.

### - Example 🗳

• Give an example that all electrical wires are colour coded. For example, the phase wires are red, yellow and blue and the neutral wire is black in colour. This enables the wires to be easily iden fied.



- Elaborate on Interna onal Organiza on for Standardiza on (ISO)
- Elaborate on Bri sh Standards (BS)

### - Say 🖻

- Tell the par cipants that:
  - The full form of IEC is Interna onal Electrotechnical Commission and it is a non-profit, non-governmental, interna onal standards organiza on.
  - It prepares standards for electrotechnology that is electrical, electronic and related technologies such as power genera on, fibre op cs, semi-conductors, marine energy, home appliances, solar energy, nanotechnology and o ce equipment.
  - IEC was formed to ensure a standard nomenclature and standard ranges of electrical machinery and appliances worldwide.
  - o The inaugural mee ng of IEC was held on 26 June 1906.
  - IEC proposed a system of standards known as the SI or the Interna onal System of Units.
  - It developed and distributed standards measurement units such as Gauss, Maxwell, Hertz and Weber.
  - o IEC has membership strength of 82 member countries and 82 a liated countries.
  - The na onal commi ees of these countries appoint experts and delegates from industry, academia, associa ons and government bodies to par cipate in technical work.
  - The IEC standards have numbers in the range of 60000 799999 and their ties take a form such as: IEC 60228.
- Tell the par cipants that:
  - The full form of NEC is Na onal Electrical Code and it is a set of codes and standards used to protect electrical workers and the public by standardizing safe installa on of electrical wiring and equipment.
  - The NEC is developed by the Na onal Fire Protec on Associa on (NFPA) of the United States and was first published in 1897.
  - The Na onal Electrical Code of Bureau of Indian Standards (BIS) takes into account several Indian Standards dealing with electrical installa on prac ces.
  - It covers the standard prac ces for selec ng electrical equipment, general safety procedures in electrical wiring and addi onal precau ons to be taken for use of electrical equipment.
- Tell the par cipants that:
  - o The full form of ISO is Interna onal Organiza on for Standardiza on.
  - o It is an independent, non-governmental interna onal organiza on.
  - o It has a membership of 163 na ons of which the BSI is one of the founder members.
  - The ISO gives world-class specifica ons for systems, products and services to ensure quality, e ciency and safety covering almost every industry.
  - o This ensures a harmonious development of standards and quality cer fica on.
  - The ISO standard related to electrical wiring is IOS9001, which is used for external quality assurance purposes.
  - It ensures conformance to specified requirements during several phases of ac vity including design, development, produc on, installa on and servicing.

- Tell the par cipants that:
  - The full form of BS is Bri sh Standards and they are developed by Bri sh Standards Ins tute (BSI).
  - The BSI started as the Engineering Standards Committee in 1901 to set standards for steel sec ons.
  - Over a period of me the standards developed to cover a wide variety of industry sectors.
  - o The standards are con nuously reviewed and developed.

#### - Notes for Facilita on

- Give the par cipants a brief overview of what all will be covered in the program.
- Start the discussion by inving the par cipants to join in.
- Introduce the topic by discussing government rules and regula ons.
- Introduce the topic of electrical codes and standards.
- Ask the students the full form of IEC and then elaborate about its history why were these standards devised, who devised them and when.
- Ask the students the full form of NEC and then elaborate about its history why were these standards devised, who devised them and when.
- Ask the students the full form of ISO and then elaborate about its history why were these standards devised, who devised them and when.
- Ask the students the full form of BS and then elaborate about its history why were these standards devised, who devised them and when.
- Ac vity handling strategy for, Match the Following:
  - o Randomly choose 4-5 par cipants to match the two columns.
  - o Ask each of them to answer and reveal the correct answer at the end.
  - o Correct answer of the ques on is as follows:

Trunk	A channel between two points
Colour Code	Dis nguishes two circuits
Bureau of Indian Standards	NEC
ISO 9001	Quality Assurance
Interna onal Organisa on for	ISO
Standardisa on	

#### Facilitator Guide

### UNIT 5.3: Work and Safety Standards

# - Unit Objec ve 🦉

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

- · Iden fy standards to improve work process
- Describe 5S standards
- Describe key elements of Kaizen
- Iden fy safety standards
- Prac ce preven ve measures
- List safety precau ons

# Resources to be Used

- Available objects such as a duster, pen, notebook and so on.
- Two toy car mechanic sets

### Do 🗠

- Welcome and greet the par cipants.
- Start the session with an ac vity that will help the par cipants understand the work standards and the working procedure

# Team Ac vity: Assembling Toy Car 🙀

- Make two groups, and name them Group A and Group B.
- Give one toy car mechanic set to each group.
- Ask them to make the model of a car using the set.
- Give an instruction manual to Group A.
- Do not give an instruction manual to Group B.

# Time 🕑

- Set 10 minutes as the me for comple ng the ac vity
- Ensure that the ac vity finishes in me.







- Ask the par cipants if they can tell some preven ve measures that they should follow to avoid any mishap at their workplace.
- Ask the par cipants if they can tell some safety precau ons that they should take while working.

#### Do 🗠

- Write the preven ve measures told by them on the whiteboard.
- Discuss each point one by one.
- Add any point missed by them.

### Explain

- Explain the importance of using safety precau ons while working with electricity.
- Tell them that any non-conformance to safety precau ons can result in:
  - o Injury to them
  - o Injury to someone else
  - o Damage to product or property
- Tell them that there are four types of injuries caused due to negligence while working with electricity. These are:
  - o Electric shock
  - o Burns
  - o Falls
  - o Electrocu on
- Explain that they should always adhere to the important safety clauses of IE rules, 1956.

#### - Notes for Facilita on I

- Give the par cipants a brief overview of what all will be covered in the program.
- Start the discussion by inving the par cipants to join.
- Ensure that you have two full working mechanic sets before star ng the session.
- A er the end of team ac vity, ask both the groups to show their models.
- Ask them to observe that Group A's model is be er than Group B.
- Explain about the importance of having standard opera ng procedures.
- Ensure that you shu e the members of Group A and B before star ng the second team ac vity.
- A er the end of team ac vity, ask both the groups to show their models.
- Ask them to observe that Group B's model is be er than Group A.
- Introduce the topic of Kaizen philosophy.
- Introduce the topic of safety standards.
- Ac vity handling strategy for Choose the Correct Alterna ve:
  - Randomly select 4-5 par cipants to answer the ques ons.
  - o Ask each of them to answer one by one and reveal the correct answer at the end.
  - o Correct answer of the first ques on is follow standards.
  - o Correct answer of the second ques on is insulated gloves.
  - o Correct answer of the last ques on is systema carrangement.







Transforming the skill landscape



# 6. Role of a Wireman

- Unit 6.1 Introduc on of the Module
- Unit 6.2 Understanding Work Requirements
- Unit 6.3 Responsibility of a Wireman
- Unit 6.4 Organiza onal Context
- Unit 6.5 Adhering to Health and Safety Norms
- Unit 6.6 Improving Work Process



ELE/N7302, ELE/N9962 ELE/N9963

### Key Learning Outcomes 🖗

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

- Iden fy work requirements
- Manage work as per given responsibility
- Handle materials correctly
- Report as per schedule and maintain proper documenta ons
- Follow the health and safety norms
- Iden fy ways to improve the work process

### UNIT 6.1: Introduc on of the Module

# - Unit Objec ves 🮯

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

- Iden fy the work requirements of a wireman and manage the work as per the given responsibili es
- Report to their supervisor and maintain the documents
- iden fy ways of improving work processes and follow health and safety norms.

Ask (ask)

- Ask the par cipants if they know about the work processes they have to follow.
- Ask the par cipants if they can tell whom they should report to.
- Ask the par cipants if they are aware of hazards at their work places.



#### UNIT 6.2: Understanding Work Requirements

Unit Objec ve

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

- · Iden fy the right way to interact with the supervisor
- · Iden fy the correct way to interact with colleagues

### - Ask

- Start the session by asking the par cipants if they can dis nguish between interac on with a supervisor and that with colleagues.
- Ask the par cipants if they can narrate any incident where there was a conflict between a par cipant and a co-worker.

# Say 🦻

- Make the par cipants understand the di erence between communica ng with a supervisor and a colleague.
- Give ps on interacing with the supervisor:
  - Explain to the par cipants how to resolve issues in case of a discord with the supervisor.
  - Tell the importance of understanding the work requirements properly as it will enable them to deliver quality work.
  - Explain to the par cipants about what they would need to discuss with the supervisor, to plan the approach of work accordingly.
  - Explain how the par cipants can learn by observing and considering the supervisor's preference.
  - Tell the par cipants that they should never delay the supervisor while on his/her way out.
  - o Tell the par cipants that they should not drag a mee ng a erit is over.
- Make the par cipants aware of the repor ng structure they need to follow.
- Highlight their scope of work as an individual.
- Discuss with the par cipants about the:
  - o Importance of working with proper coordina on in a team.
  - o Basic conflicts that may arise between them and a co-worker or a supervisor.
  - Topic of communica on to ensure they understand the possible consequences of lack of communica on or miscommunica on while working.
  - o Possible disrup ons at work which may hamper the workflow.

- Explain to the par cipants how they can have a be er rela onship with their manager giving examples like:
  - There will o en be mes when you may disagree with your manager and end up in a conflict. You may not be able to solve every disagreement but there is always an op on of a common point of view.
  - It is important to pay a en on to your supervisor's communica on preferences. There may be an instance when a supervisor is more comfortable with a verbal status rather than a mail.

Facilitator Guide

### UNIT 6.3: Responsibility of a Wireman

## - Unit Objec ve 🤘

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

- Iden fy the skills required for the work of a wireman
- Iden fy standards and codes for the work of a wireman
- Categorize work as per the drawing and manuals

Say 🔎

- The par cipants should be given knowledge about the wires they would be working with.
- They must be given thorough informa on about the standards and electrical codes.
- They must be explained how to interpret di erent wire diagrams.

## Explain

- Explain to the par cipants how they need to collect cables and wires and execute proper posi oning of a panel.
- Explain the basic responsibilies of a parcipant:
  - o Install new wiring
  - o Repair old wiring
  - o Fix errors of an electrical panel
  - o Assemble components of a control panel
- Share a table of codes and standards with them and explain the importance of adhering to it.
- Explain to them in detail how to read instruc ons and warnings, other textual labels or informa on wri en on the components of the product.
- Discuss the most common errors, their causes and measures to prevent them. Give them examples:
  - o Errors caused by use of a Digital Mul Meter (DMM) in an incorrect se ng.
  - o Not enough insula on to prevent electrical shocks.
- Recall the wire diagrams done in module 2 to reiterate that wiring of the control panel is the key role and responsibility of a wireman.
- Explain to the par cipants that the components and equipment must be used and maintained properly.

# - Notes for Facilita on 🗐

To facilitate the ac vity of me management:

- Give each par dipant any three of the following and ask them to dassify them as 'urgent', 'important' or 'waste of me':
  - o Managing tools
  - o Tes ng the wire connec ons
  - o Securing unsafe wiring
  - o Surfing the phone
  - o Cha ng with friends
  - o Reporing to the supervisor in case of a mishap
  - o Sharing work status with supervisor
  - o Coordina on with the team for comple on of work

Facilitator Guide

#### UNIT 6.4: Organiza onal Context

#### Ø Unit Objec ve

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

- Iden fy the organiza onal context •
- Follow company policies and rules ٠
- Maintain records and complete forms

Ask ask

- Ask the par cipants to tell what they should report and to whom. •
- Ask them if they know about their role as per the workflow.
- Ask the par cipants which documents they will have to fill in and submit.

Sav Share a template of a work order such as the following one and guide the par cipants in comprehending it. COMPANY NAME WORK XXX, Street no. X City, Pin code - XXXXXXX ORDER Order Date: Customer Order No. : Phone: Order taken by: Starting Date: Servicer: Bill To: Address City-State-Pin Code: Signature of Recipient Job Name/Location: Job Phone No. : Description Comments: Total Material: Total Labour: TAX: Total Due: Date completed: I hereby acknowledge that work specified above is completed. Signature Fig 6.4.1: Workorder template

#### -Explain

- Explain to the par cipants what organiza onal context refers to - such as work division/department, work unit or work role.
- Explain to them that they need to be aware of set protocols like:

- o Follow rules and policies laid down by the company
- Follow the structure of reporing
- o Adhere to the defined role of work
- o Complete the documenta on process
- Explain the common policies of the company which include the following:
  - o Repor ng and dispersing on me
  - o Not carrying out illegal ac vi es
  - o Coordina ng with co-workers to e ec vely complete deliverables
  - Following a proper code of conduct in terms of behaviour and work output delivered
- Explain the importance of filling forms and subming to the respecive 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 sec on containing a close aide's name and contact informa on, who can be contacted in case of an emergency. It would also include a sec on which lists the employee's allergies, if any.
  - o Upda ng forms or a database to fill invoice details.
  - o Upda ng a endance sheet for record keeping.
  - o Filling up leave applica on forms for planned leaves.

#### Facilitator Guide

#### UNIT 6.5: Adhering to Health and Safety Norms

## - Unit Objec ve 🤘

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

- Iden fy safety issues at work
- Iden fy health issues at work
- Prac ce the preven ve measures to be taken

Ask (ask)

- Ask the par cipants if they can list the steps to be taken in case a fire breaks out.
- Ask them to name the safety gears a wireman should use.
- Ask the par cipants 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 par cipants to list a few poten al hazards.
- Ask them about the basic first aid steps by giving them the following situa ons:
  - o A co-worker faints
  - o A co-worker burns his/her finger
  - o Someone su ers a bee s ng
  - o Someone chokes while ea ng
- Explain
- Explain to the par cipants how providing health and safety informa on helps to ensure that the employees work safely and without risks to their health. For example, it is essen all 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.
  - o The basic first aid measures so that he/she may help a vic m.
  - o The importance of iden fying, repor ng and escala ng any poten al hazard.
  - o The basic health guidelines drawn by the company.
  - o The need to assess and control risks.
- Tell that e ec ve health and safety training shall help them in being competent during an unforeseen mishap. For example:
  - o Electric shocks
  - o Falls
  - o Burns
  - o Inhaling any foreign body
  - o Cut

- Explain to the par cipants about Electrosta c Discharge also known as ESD. Tell them how
  ESD is harmful for sensi ve components while assembly of the device, produc on and
  shipping. Microchips can be damaged by ESD. To prevent ESD, grounding is crucial. A
  Human Body Model (HMB) is a frequently used model for tes ng the vulnerability of
  electronic equipment to ESD from human contact. This ESD simulator shows the discharge
  that might happen from an electronic device due to human touch.
- Talk about the protec ve 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 dothing.
- Explain to them the method of using a basic equipment like a fire ex nguisher or raising a fire alarm.
- Tell them about the procedures they are required to follow in case of emergencies.
- Explain to them in detail about providing first aid.
- Explain the importance of maintaining a proper posture while working.
- Tell the par cipants about the signs typically used to signal an emergency.

### UNIT 6.6: Improving Work Process

### · Unit Objec ve 🙆

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

Iden fy ways to improve the work process

### Explain

- Explain to the par cipants how small process improvements can be set up and executed in a short period of me.
- Explain how zero-defect work can be achieved. Tell the par cipants that zero defects mean that there should not be any wastage while working on an exis ng project.
- Explain that Zero defects theory is based on four fundamentals for successful implementa on of projects.
  - Quality means adhering to requirements. Understanding and fulfilling requirements as per instruc ons 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, rework, labour, customer dissa sfac on and lost revenue.
  - Quality should be maintained according to the zero defects theory. Mistakes are not inevitable. Perfec on in work, and not just being good, should be the aim.
- Explain to the par cipants that anything during the project, which is unproduc ve and does not add value to it, should immediately be removed.
- Tell them the importance of quality in work and mely delivery.
- Explain the importance of reporing to the supervisor in case of a change in project plans.
- Explain that work done should comply to set standards and regula ons of the company.
- Tell the par cipants that a dean work area will make them feel posi ve about the work and help them avoid waste of me.

#### Notes for Facilita on

- To facilitate a discussion, refer to the following ques ons to encourage the par cipants to answer:
  - o Maintaining a dean work environment

What should you do if you see a worksta on with various equipment sca ered 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 mely comple on of work

What steps should you take to enable yourself to complete your work on me? 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?

o Achieving Zero defect in work

Do you think inappropriate ligh ng 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 di erence while working on a circuit breaker?

- To facilitate iden fica on of poten al hazard, give the par cipants an example.
- Tell them how while working an employee used to slouch too much while si ng on the chair. Despite being asked to use preven ve measures, the incorrect posture of working led to a severe backache for a long period of me.
- Further ask the par cipants to describe any of their experiences of spo ng a poten al hazard related to health and safety before moving on to a empt the ques ons.









Transforming the skill landscape



# 7. Interact with Co-workers

Unit 7.1 – Introduc on of the Module Unit 7.2 – Interact with Supervisor Unit 7.3 – Interact with Colleagues Unit 7.4 – So Skills



## Key Learning Outcomes 💈

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

- Iden fy the right way to interact with supervisors and colleagues
- Use so skills required for doing the job
#### UNIT 7.1: Introduc on of the Module

## Unit Objec ves 🤘

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

- Iden fy the work requirements clearly for the work assigned to them
- Iden fy the importance of working in a team
- Demonstrate the ways to e ciently communicate with team members
- Describe so skills that would help them work e ciently with colleagues and supervisors

Ask 🔍

- Ask the par cipants if they know what the job of a wireman is and what all does it involve.
- Ask the par cipants to tell what according to them are the skills required to do the work of a wireman.
- Ask them if they know whether a wireman works in isola on or in a team.
- Ask them to share their expecta ons from this course.

#### UNIT 7.2: Interact with Supervisor

## - Unit Objec ve 🤎

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

- Define work requirements
- Iden fy the right work ethics
- · Iden fy what customer feedback is

## Ask

- Start the session by asking the par cipants what they think the job of a wiremanis.
- Ask them to tell if they know about the skills required to do the work of a wireman.

## Say

- Understand the task which must be performed. This includes understanding:
   The requirements of the task
  - o The need to be competent and knowledgeable to do the task
  - o The need for an ability to solve the problem
- Understand that the supervisor is assigned to get the work done. One should always follow the chain of command or the line of authority for a smooth flow of work.
- Understand the various tools and equipment which will be required to perform the task.
- You should keep abreast with new developments and new product models that are in the market. Ask your supervisor if he knows about any new product or new developments that are in the market. Read about them in magazines, journals and on websites.
- Always plan and organize your work for greater e ciency. You can keep control on your work by measuring it against the standard or the bench mark.

## Ask (ask)

- Then, ask the par cipants what work ethics are and are there ethics involved in the work of a wireman.
- Also, ask them why the feedback of the customer is important.

#### Notes for Facilita on

Tell the par cipants that for certain urgent ma ers, it is the duty of the wireman to report to the supervisor or interact with him immediately. Some examples include:

• You no ce a safety breach, which can result in an accident. You must escalate the ma er to your supervisor.

- You no ce an unethical ac on happening around. You must report to your supervisor.
- You no ce any other work-related issues, which may raise a concern. You must escalate the ma er to your supervisor.

## Say 🦻

- Tell the par cipants that feedback helps to understand the problems and the good things in the work which you have done. It helps to outline the scope for further improvement. It also makes the customer feel happy that they can give feedback regarding the service. The feedback also helps the supervisor monitor your work, e ciency, and other key performance aspects of your work that may relate to appraisals and further assignments.
- Tell the par cipants to remember that all the members of a team, whether a senior or a junior, may work together or may work on individual projects to fulfil the organiza ona l goals. Therefore, it is important to understand that the role of each team member is significant for the organiza on.
- The process flow of the work that takes place in a day in the life of a wireman includes:
  - o Issuing the tools from the stores. Ensure that you issue the tools and use them
  - o properly and return a er the use.
  - o You may also have to a end to customer complaints.
  - You should also help your colleagues, if it is required.

#### UNIT 7.3: Interact with Colleagues

## - UnitObjec ve 🤎

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

- Define the role of the team members
- Iden fy the work place rela onships
- · Iden fy work behaviour

## Say 🤷

Highlight to the par cipants the importance of the following:

- Working in a team.
- Team members must be aligned to the targets and must work in coordina on and harmony.
- All the members are di erent and each one has a special quality to be in the team.
- Adherence to me and quality is important.

## Explain 🕎

- Explain to the par cipants that the work that is assigned to them will also have certain melines which they should follow. It is important to adhere to the targets and melines so that there is no conflict between team members and also no delay.
- Work done should always match to the company delivery standards. There are incen ves for the work done well. Be aware of such incen ves and try to achieve them. This leads to having a sense of sa sfac on and achievement.
- The manager has certain du es and responsibili es. It is the duty of the manager to get the task done, which may not be involving working directly on the control panel.
- Similarly, a supervisor may be direc ng working on the wiring process however the work involves ge ng all the wireman to perform the task as per the blueprint and maintain healthy and safe working condi ons.
- The wireman should be able to work in harmony with colleague or members in the team. In case of any conflict the ma er should be resolved by communica ng with them. If the need for an interven on by a senior is felt, then the ma er should be reported to the supervisor.
- While doing work and any interac on related to work the interest of the organiza on should be the focus.
- All the members may work together or may work, on individual's projects to fulfil the organiza onal goals.
- It is important to understand the role and responsibility of each one of the team members and the task being performed by that person.

## - Notes for Facilita on 🗐

To facilitate the role play:

- Ask one par cipant to play the role of supervisor and another one to be Ravi.
- In case the par cipants hesitate or do not know where to begin, provide them hints, such as the basic roles and responsibilies of a wireman. Ask them that in case of any task or emergency or report, whom should they 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 par cipants that the objec ve of this role play is to understand the following:
  - o Role of a supervisor
  - o Role of a colleague
  - o Work of a wireman
  - o Role and responsibility of each team member
- Ask the par cipants to prepare for the role play for 15 minutes and then perform it.
- Prepare the following:
  - o Supervisor
    - Work schedule and a wire diagram Line of command chart Important safety equipment
  - Colleague
     Important things while at work
     Show good rela on and helping a tude
     Use of safety equipment
     Other important things at work
  - o Ravi

Show posi ve learning a tude Ask ques ons and show eagerness to learn

#### UNIT 7.4: So Skills

## - Unit Objec ve 🖾

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

- · Iden fy good communica on skills
- Explain team work
- Demonstrate decision making skills
- Recognize reflec ve and cri cal thinking skills

## Say 2

- Communica on is a two-way process.
- The sender of message, who has a need to communicate with another person, the receiver of the message, can send a message. This happens in a medium and then reaches the receiver who then responds, based upon the understanding of the message.
- Communica on 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. In the morning when you join for work, your supervisor gives you a wire diagram and tells you the task which has to be performed (Message). Wire diagram is the wri en medium of communica on. The telling becomes the spoken communica on. In this case you are the receiver of the message. When you respond a er having understood the message then that becomes a feedback.
- Tell the par cipants that communica on includes:
  - Verbal Communica on It mainly consists of the spoken words, such as, you are talking to your team members or talking on phone with the customer.
  - Non-verbal communica on It consists mainly of gestures, facial expressions and movements. You show a thumb up to say that the connec on of wiring is done to your assistant, who is far away, or you call your assistant by waving to come closer with the cord.
  - Wri en communica on It is the wri en form of communica on such as, reports, analysis and e-mails. The wiring diagram, which is a wri en document, a report which has been submi ed or an applica on, all are examples of wri en communica on.

Then inform the par cipants about some basic Dos and Don'ts of communica on using the following points:

Do's	Don'ts
Communica on should be very clear and	Don't communicate when you are not sure.
precise. Men on all the details required to	Also, never give incorrect details.
take ac on. Also, men on dearly the ac on	
intended.	
Communica on should be concise or short.	Never give incomplete message.
It should not have irrelevant details which is	
of no concern to the recipient of the	
message.	
Communica on should be concrete.	Never communicate in an uncourteous
Men on the specific and ac onable things.	way.
The message in communica on should be	Don't use jargons that the recipient may be
coherent or should be related. If you have	unfamiliar with. Don't use complex words or
to men on something extra, then men on	sentences.
dearly that it is an addi on. Meaning is	
derived when the en re message is in	
context.	

Fig 7.4.1: Do's and don'ts of communica on



- Explain to the par cipants that to be able to listen ac vely and to ensure that they can respond and understand e ciently, they need to:
  - Stop talking to listen to what the other person has to say.
  - o Remove any external noise or distrac ons.
  - Don't jump to a conclusion or respond the moment the other person begins to speak.
  - o Try not be defensive in a conversa on, especially when you are receiving a feedback.
  - o Show your interest in listening to a person who is speaking through non verbal dues such as a nod or words such as hmm, yeah and so on.
  - o Ask for details to get the complete informa on.
  - o Filling up leave applica on forms for planned leaves.

#### Notes for Facilita on

- Finally, explain to the par cipants, the concept of team work and team building. Tell them that:
  - o Teamwork is defined as coming together of people to achieve a common goal. The goal here is the organiza onal goals. The daily tasks which are assigned are a part of the organiza onal goals. Team work means that each member in the team is contribu ng equally to the tasks.

- In a team, all the members are important and might be dependent on each other for work. Some mes the members do the work individually. However, the collec ve result is a team e ort, similar to what you will see in a game of cricket or during the construc on of a building or building an aircra. It is also important to understand that the work may depend on the comple on of your task. Therefore, for the smooth progress of work you should complete your task on me.
- For the ac vity, The Communica on Game, do the following:
  - Tell the par cipants that the objec ve of the ac vity is to understand the importance of the following:
    - Verbal communica on
    - The type of instruc ons which should be given
    - Feedback
    - Direct interac on with the concerned person for proper communica on.
  - Take 5 minutes for each ac vity. Ensure that you have simple and not too complicated images, which can be work related or general.
  - Make the par cipants sit back to back or behind the board and then pass the instruc ons to draw.
  - Later, a er the ac vity, you can comment on how the instruc on passing and interpreta on could have been be er.
- For the ac vity, Case Discussion, do the following:
  - Tell the par cipants that the objec ve of the ac vity is to understand the importance of the following:
    - Planning and scheduling of work
    - Organizing task
    - Handling work pressure
    - Maintaining helping but asser ve behaviour
    - Being responsible and accountable for work
  - Make four groups. Let the par cipants discuss the case for 20 minutes and come up with solu ons for their colleagues. Have a presenta on where all the groups should individually present the case.
- For the ac vity, Team Game, do the following:
  - Tell the par cipants that the objec ve of the ac vity is to understand the importance of the following:
    - Non-verbal communica on Leadership
    - Team work
  - Make two groups. The more the number the be er. One par cipant can act as the leader and guide the team to stand as per their date of birth, in ascending or descending order. They cannot talk but can use non -verbal gestures to do this ac vity.

## Ask (ask)

- Ask the par cipants what decision making is.
- Ask them if they think that decision making is di cult and the reason for it.
- Ask them to tell what they know about reflec ve thinking. Also, ask the par cipants what they understand by the term "cri cal thinking".

#### Say 🤷



Fig 7.4.2: Cri cal thinking process









Transforming the skill landscape



# 8. Maintain Safe Work Surroundings

Unit 8.1 – Introduc on of the Module Unit 8.2 – Safety Measures and Standards Unit 8.3 – Occupa onal Health and Wellness



## Key Learning Outcomes 🖞

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

- Iden fy the safety guidelines
- Use safety equipment e ciently
- Demonstrate safety measures
- Prac ce emergency procedures
- Demonstrate handling of heavy and hazardous materials
- Maintain good health
- Par cipate in health sessions

#### UNIT 8.1: Introduc on of the Module

## - UnitObjec ves 🙆

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

- Explain safety measures and standards at work
- Demonstrate safety guidelines that should be followed at workplace
- Iden fy various safety equipment required and demonstrate safety measures
- Explain emergency procedures and demonstrate handling of heavy and hazardous materials
- Understand the importance of maintaining good health and par cipa ng in health sessions



#### UNIT 8.2: Safety Measures and Standards

## - Unit Objec ve 🖾

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

- Discuss the safety guidelines
- Iden fy the safety equipment
- Demonstrate the safety measures
- Prac ce the emergency procedures

#### Resources to be Used

- Available objects such as a duster, pen, notebook and so on.
- Protec ve equipment such as a helmet, gloves, goggles and so on.
- Portable fire ex nguisher

## Ask (ask)

- Ask the par cipants to tell some safety guidelines that they should follow at workplace.
- Ask the par cipants if they know what the term 'ESD' stands for.
- Ask them if they know the meaning and poten al causes of ESD.
- Ask them if they can tell how to reduce the risk of ESD.

#### Say 5

- Understand the task which must be performed. This includes under standing:
   The requirements of the task
  - o The need to be competent and knowledgeable to do the task
  - o The need for an ability to solve the problem
- Understand that the supervisor is assigned to get the work done. One should always follow the chain of command or the line of authority for a smooth flow of work.
- Understand the various tools and equipment which will be required to perform the task.
- You should keep abreast with new developments and new product models that are in the market. Ask your supervisor if he knows about any new product or new developments that are in the market. Read about them in magazines, journals and on websites.
- Always plan and organize your work for greater e ciency. You can keep control on your work by measuring it against the standard or the bench mark.



## Explain

- Explain that it is very important for them to use safety equipment while working as they provide protec on to various parts of their body.
- Inform the par cipants that always remove rings, chains or bracelets or other metal objects before working on the panel. Also, tell them that they should use the prescribed protec ve safety equipment such as rubber shoes, helmet, gloves, and so on.
- Tell them that:
  - Goggles provide them eye protec on from hazards such as electric sparks, minute flying par des and dust.
  - Helmets provide protec on from injury to head from falling objects and slipping and tripping.



- Shoes provide foot protec on from hazards such as electrocu on, falling of hot or heavy objects and slippery floor.
- o Ear plugs provide hearing protec on from extreme noise levels.
- ESD pins provide protec on from electrosta c current which can cause electric shocks.

#### Demonstrate 🖳

- Demonstrate the procedure of using a fire ex nguisher.
- Ac vity 🖉
  - Conduct a mock fire drill.

## Time 🕑

- Set fi een minutes as the me limit of the ac vity.
- Ensure that the ac vity finishes within me.

#### Explain 🗋

- Briefly explain the steps of a fire drill.
  - Fire evacua on strategy: Make a clear and concise evacua on plan that meets the need of your building and its occupants.
  - Ac on on hearing the fire alarm: Everyone should respond to the sound of the fire alarm and exit in an orderly manner.
  - o Calling the fire brigade: Call the fire department and give them your loca on.
  - Iden fica on of key escape routes: Plan at least two emergency exits so that if one is blocked, the other can be used.
  - Appropriate use of the fire ex nguisher: Demonstrate the correct way to use a fire ex nguisher.
  - Correct use of the emergency evacua on plan: Appoint someone to monitor the drill and measure the dura on of a complete evacua on.
  - Explain that a er comple ng every fire drill they should:
    - o Record the total evacua on me.
    - o Silence the alarms.
    - o Ensure that the fire alarm system is back to normal opera ng condi on.
    - o Re-evaluate any concern that arose during the fire drill and discuss it.
    - o Keep record of the fire drill and of any note on the evacua on checklist report.

#### - Say 🔎

- Tell the par cipants that to make the workers capable of handling emergency situa ons, workshop trainings are conducted.
- Tell that the mock fire drill they just conducted is also an integral part of the workshop training.

#### - Explain 🗋

- Explain that the employee workshop training would include:
  - Roles and responsibilies of the wiremen
  - o Threats, hazards, and protec ve ac ons to be taken
  - o No fica on, warning, and communica on procedures in case of an emergency
  - o Evacua on, shelter and accountability procedures in case of an emergency
  - o Emergency shutdown procedures

#### Ask ask

• Ask the par cipants if they know what to do in case of an emergency, a fire or an accident.

#### Explain 🗋

- Explain that they should follow certain procedures:
  - o In case of a fire:
    - Try to remain calm.
    - Pull the fire alarm.
    - Move quickly to the nearest exit.
    - Use the staircase, do not use the li .
    - Assist others in evacua ng.
    - Call the fire sta on and give your loca on.
  - o In case of an accident:
    - Determine the extent of injury. Provide first-aid for minor injuries. Inform medical personnel and paramedics. Avoid moving or shi ing the injured.
  - In case of an emergency such as an earthquake: Take shelter under tables, desks and so on. Stay away from the windows. Leave the building as soon as it is safe.

## In case of a violent or a threatening person: Try to remain calm. Do not confront the person. Do not try to subdue the person.

Inform the security as soon as it is possible.

## Notes for Facilita on

- Give the par cipants a brief overview of what all will be covered in the program.
- Start the discussion by inving the part cipants to join in.
- Introduce the topic by discussing safety guidelines.
- Write the safety guidelines men oned by the par cipants on the whiteboard.
- Add any point not covered by them.
- Go over each point one by one and explain it in a few sentences.
- Explain the full form of the term 'ESD' and its meaning.
- Go over the causes of ESD one by one and explain each point briefly.
- Write the ESD safety guidelines men oned by the par cipants on the whiteboard.
- Add any point not covered by them.
- Tell them that they should:
  - o Hold the IC by its body and not by the pins.
  - o Hold the PCBs by their edges.
  - Never place the components on a metal surface. This is so because there is a stacc charge in metal surfaces which can cause damage to the sensive electronic parts.
  - Leave all the electronic components in their ESD-safe packaging II the me they are not in use.
  - Never touch anyone working on integrated circuits. This is so because everybody has a charge and touching someone who is grounded can lead to ESD.
  - Desist from wearing synthe c dothing such as polyester because there is an electrosta c field surrounding these non-conductors and it cannot be removed completely.
- A er going over the safety guidelines, introduce the topic of safety materials and equipment.
- Next, tell them that the most important safety equipment is the fire ex nguisher.
- Explain its importance as a first level of protec on against any fire hazard.
- Explain the purpose of conducing a fire drill.
- Tell them that a er comple on of every drill they should evaluate the e ec veness of the drill.
- Tell them that to be e ec ve, the fire drill should be carried out periodically and should use di erent escape routes every me.
- Next, tell them that the fire drill is a part of employee workshop training.
- Explain that every organiza on has an emergency plan to manage any emergency or accident that might occur.
- Tell them that they should be aware of the procedures to be followed in case of any emergency.

#### UNIT 8.3: Occupa onal Health and Wellness

#### 🗉 Unit Objec ve 🤎

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

- Maintain correct posture while working
- · Demonstrate handling of heavy and hazardous materials
- Maintain good health
- Define a health session

## • Resources to be Used

- Available objects such as a duster, pen, notebook and so on.
- A big box

Ask (ask)

- Ask the par cipants how long they generally sit or stand in one posi on at work.
- Ask the par cipants if they know the meaning of the term 'Posture'.
- Ask the par cipants if they can tell the reasons that make manual handling of heavy and hazardous materials di cult.

- Explain 🗋

- Introduce the topic of maintaining appropriate posture.
- Explain that posture means the way we hold our body when we sit, stand, li , bend and so on.
- Explain the importance of maintaining a good posture while working and the consequences of bad posture habits.
- It is important to understand the role and responsibility of each one of the team members and the task being performed by that person.

Demonstrate 🖾

Show the correct and incorrect postures while standing, sing and ling a load.

Explain

Explain that while standing you should:

- o Stand with your feet apart and balance equally on both.
- o Pull the shoulders back.
- o Keep your knees straight.

- o Tuck your stomach in.
- o Li your chin.
- Explain that while si ng you should:
  - o Sit with your back straight.
  - o Place your bu ocks at the back of the seat
  - o Place your feet flat on the floor with your knees bent at a 90-degree angle.
  - o Pull the shoulders back.
  - o Li your chin.
  - Explain that while li ing a load you should:
    - o Place the load in front of you.
    - o Bend the knees to a squat posi on.
    - o Bring the load towards your chest.
    - o Tighten the lumbar muscles to "lock" the back.
    - o Li from the legs to a standing posi on.
- Do not:
  - o Overreach or stand on ptoes.
  - o Li from a twisted or a sideways posi on.
  - o Li from a forward stooped or an imbalanced posi on.
- Explain that incorrect standing or si ng in an incorrect posture for long periods results in:
  - o Back pain
  - o Neck pain
  - o Degenera on of spine
  - o Wear and tear of muscles
- Introduce the topic of manual handling of heavy and hazardous materials.
- Explain that the risks associated with handling of heavy and hazardous materials can be reduced by:
  - o Iden fying the hazard
  - o Assessing the risk
  - o Selec ng appropriate measures to control or reduce the risk

#### Example

- Give an example that if they have to li a huge box of wires then they should:
  - First, iden fy the hazard ' they should check if it is heavy, if it is di cult to grasp and so on.
  - Second, they should assess the risk associated with the load ' they should assess if it is strenuous to li , if there is a danger of it falling over, if there is adequate space to li it, if the floor is slippery or dirty and so on.
  - Third, they should select the appropriate measures to reduce the risk ' they should li it in such a way that it does not cause them any injury or strain, they should choose proper li ing aid and so on.



- one each for load, task, workplace and individual. Do not write the column headings as yet.
- Write down the reasons for di culty in handling heavy loads as cited by them on the whiteboard in the appropriate columns.
- Add any point missed by them.
- Now, give column headings as load, task, workplace and individual.
- Explain each factor one by one.









Transforming the skill landscape



# 9. Employability & Entrepreneurship Skills

- Unit 9.1 Personal Strengths & Value Systems
- Unit 9.2 Digital Literacy: A Recap
- Unit 9.3 Money Ma ers
- Unit 9.4 Preparing for Employment & Self-Employment
- Unit 9.5 Understanding Entrepreneurship
- Unit 9.6 Preparing to be an Entrepreneur



#### Introduc on: Employability and Entrepreneurship Skills

This Facilitator's guide includes various ac vi es which will help you as a facilitator to make the sessions par cipa ve and interac ve.

Ice breaker

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

Five of Anything Ice Breaker Steps:

- Divide the par cipants into groups of four or five by having them number off. (You do this because people generally begin a mee ng by sit ng with the people they already know best.)
- Tell the newly formed groups that their assignment is to share their five favourite movies of all me, 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 dass upon comple on of the assignment.

#### Expecta on Mapping

During the first session and after ice breaker session, ask the par cipants to answer the following ques on: "What do lexpect to learn from this training?"

- 1. Have one of the par cipants write their contribuons 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, commen ng on what will and what will not be covered during the training.
- 4. Set some ground rules for the training sessions. Ask the par cipants 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. Benefitsofdoingthisac vity:
  - Par cipantsfeel better as their opinions are heard.
  - Par cipants 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. Expecta onsfrom the par cipants:
  - Must sign the attendance sheet when they arrive for class.
  - Conduct themselves in a posi ve manner
  - · Bepunctual, atten ve, and par cipa ve
- 8. Explain the contents that are going to get covered one by one and connect it with the expecta on mapping done earlier.
- 9. By the end of this exercise, the par cipants should have a clear understanding of what to

expect from the session and what are the areas that will not get covered.

DefiningObjec ves

- 1. Defining the objec vesin the beginning of the units sets the mood for the unit.
- 2. To begin with the end in mind sets the expecta ons of the par cipants as what could be the important takeaways from the session.
- 3. It is also a way of making par cipants take responsibility of their own learning process.
- 4. For the facilitator, the objec ves decide a designed path to progress on so that the learning stays aligned and on track.
- 5. Read the objec vesslowly, one by one, and ask the par cipants to explain what they think it means.
- 6. At the end of the session, you could again revisit the objec ves to find out from the par cipants about how many objec ves have been achieved.

In order to effec vely facilitate this workshop:

- 1. You must have thorough knowledge of the material in the Par cipant Handbook, and be prepared to answer ques ons 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 me or knowledge.

You can either state that you will obtain answers and get back to the par cipants with the informa on. In case the query can be turned to an assignment to the class, do so. You can work with the par cipants on the assignment.

- 4. You must have a very clear understanding of what the par cipants want to accomplish by the end of the workshop and the means to guide the par cipants.
- 5. As the facilitator, it is your responsibility to make sure that all logis cal 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 par cipants.
- 8. Probe the par cipants further and lead them to come to affirma ve conclusions.
- 9. Let the par cipants answer. No answer is incorrect.
- 10. Ask one par cipant 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 instruc onsfor 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 situa on in which you can prac ce certain skills.

- 2 When you read the brief, try to imagine yourself in the situa on 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 star ng point. It simply sets the scene and the tone of session or ac vity. Try not to keep referring to the brief as this will affect the spontaneity of the mee ng. Allow the role play to develop as you think it might in real life and change your reac ons in line with the behavior and responses of others involved.
- 5. If you find that you have too little informa on to answer ques ons or to describe what has happened in the situa on, 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 improvisa ons asrealis caspossible.

#### UNIT 9.1: Personal Strengths & Value Systems

#### Key Learning Outcomes 💈

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

- 1. Explain the meaning of health
- 2 List common health issues
- 3. Discuss ps 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 cri cal safety habits to be followed by employees
- 9. Explain the importance of self-analysis
- 10. Discuss mo va on with the help of Maslow's Hierarchy of Needs
- 11. Discuss the meaning of achievement mo va on
- 12 List the characteris cs of entrepreneurs with achievement mova on
- 13. List the different factors that mo vate you
- 14. Discuss the role of at tude in self-analysis
- 15. Discuss how to maintain a posi ve at tude
- 16. List your strengths and weaknesses
- 17. Discuss the quali es 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 characteris cs of highly crea ve people
- 22. List the characteris cs of highly innova ve people
- 23. Discuss the benefits of me management
- 24. List the traits of effec ve me managers
- 25. Describe effec ve me management technique
- 26. Discuss the importance of anger management
- 27. Describe anger management strategies
- 28. Discuss ps for anger management
- 29. Discuss the causes of stress
- 30. Discuss the symptoms of stress
- 31. Discuss ps for stress management



• You will need at least 4 volunteers (Narrator, Health Representa ve, Head of the Village,



• At the end of 5 minutes, ask the par cipants to check howmany ckshave they got.

#### Summarize 🖉

(ask)

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

## Ask C

Sav

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

• Discuss the meaning of hygiene as given in the Par cipant Handbook.

Ac vity 🦉 \_\_\_\_

Health Standard Checklist: Hygiene

#### Say 🤷

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

#### Do 🗸

- Ensure that all the par cipants have opened the right page in the Par cipant Handbook.
- Read aloud the points for the par cipants and explain if required.
- Give them 5 minutes to do the exercise.
- At the end of 5 minutes, ask the par cipants to check how many cks have they got.
- Ask them to calculate their score.
- Tell them what each score indicates by reading aloud what has be en men oned in the Par cipant Handbook.

Ask 
How many of you have heard about "Swachh Bharat Abhiyan"?

• Can you tell the class what it is about?



#### UNIT 9.1.2: Safety

Unit Objec ves 🦉

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

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

## - Resources to be Used

- Par cipant Handbook
- Safety signs and symbols
- Safety equipments
- Blank papers
- Pens

#### Say 5

- There are many common safety hazards present in most workplaces at one me or another. They include unsafe condi ons 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, sca olds, 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.
  - o Machinery-related hazards (lockout/tag out, boiler safety, forkli s, etc.)

## - Team Ac vity 🟙

#### Safety Hazards

- There are two parts to this ac vity.
- First part will cover the poten al 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 ac vity.

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



Ask (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 par cipants what they have learnt so far.
- Ask if they have any ques ons related to what they have talked about so far.
- Close the discussion by summarizing the ps to design a safe workplace and nonnego able employee safety habits.

# UNIT 9.1.3: Self-Analysis-At tude, Achievement Mo va on: What is Self-Analysis?

	In	it	$\cap$	h	iec	ves	Ø
U	11	IL	U	N		VUS	

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

- Explain the importance of self- analysis
- Discuss mo va on with the help of Maslow's Hierarchy of Needs
- Discuss the meaning of achievement mo va on
- · List the characteris cs of entrepreneurs with achievement mo va on
- List the di erent factors that mo vate you
- Discuss the role of a tude in self-analysis
- Discuss how to maintain a posi ve a tude.
- List your strengths and weaknesses

## - Resources to be Used

- Par cipant Handbook
- Old newspapers
- Blank papers
- Pencils/ pens

Ac vity 🖉

This is a paper pencil ac vity.

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 ques ons on the board/flipchart before the session begins.
- Give plain papers and pencils/ pens to each par cipant.
- Tell par cipants to write the answer for the three ques ons on the paper.
- Tell them the purpose of this ac vity is not to judge anyone but to understand more about self.


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 di erence 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 di erence to this one." What di erence are we making? Big or small, it does not ma er. If everyone made a small di erence, we'd end up with a big di erence, wouldn't we?

Ask ask What did you learn from this story? Ac vity What Mo vates You? This is an individual ac vity. • It is an exercise given in the Par cipant Handbook. Do Ask the class to open their Par cipant Handbook and complete the exercise given in the sec on What Mo vates You? Ensure that the par cipants have opened the correct page for the ac vity. Give the class 5 minutes to complete the ac vity. Say Discuss the concept of at tude and how to cul vate a posi ve at tude as discussed in the Par cipant Handbook. **Summarize** Close the discussion by summarizing how self-analysis, knowledge about what

mo vates you and your posi ve at tude can help in your business as well in life.



- Put down the de-brief ques ons on the board and ask the groups to focus their discussion around these ques ons.
- The group is expected to analyse and discuss the case amongst them and find a solu on to the given problem.
- Give the dass5-10 minutes to discuss the case and note down their solu ons.
- At the end of 10 minutes the team should present their case solu on to the class. The presenta on can be a narra on 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 presenta on.

# Team Ac vity 🕍

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 shou ng 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 thr eatens to sue him and to go to Consumer Court for chea ng her. Now, the problem occurred somewhere outside the shop but as other customers were listening to the conversa on, it might impact his business. The situa on needs to be managed very sensi vely. What would you do if you were in Aakash's place?

#### Scenario 2

Rajni does beau ful 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 weddingwas 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 duppatas, 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 func ons. 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 ar st 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 dient?

#### Scenario 4

Shailender is an online doth reseller who does business through social networking sites such as Facebook and WhatsApp. Priyanka made online payment for a dress to Shailander. But she did not receive the dress for a month. When she asked for a cancella on, Shailander 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 Howcould this situa on have been managed?

# Say 🤷

- Now, let's discuss the problem and solu on with the larger group.
- The group will first briefly describe the case to the class.
- Then discuss the issue iden fied and the proposed solu on.
- Once the presenta on is over, the class can ask their ques ons.

### - Do 🗠

- Congratulate each group for the group presenta on.
- Ask the audience to applaud for them.
- Ask de-brief ques ons to cull out the informa on from each group.
- Keep a check on me. Tell the group to wind up the discussion quickly if they go beyond the given me limit.

# - Summarize 🔎

- Ask the par cipants what they have learnt from the exercise/ ac vity.
- 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 9.1.5: Crea vity and Innova on

# Unit Objec ves 🦉

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

- List the characteris cs of highly crea ve people
- · List the characteris cs of highly innova ve people

# Resources to be Used

- Par cipant Handbook
- Chart papers
- Marker pens

# - Ask 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 innova velowcost water purifier.

Inspira on 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 dean water without having to make an investment in purchasing a filter/purifier. Soring's idea is to have a centralized purifica on system at the point of distribu on like water tank while Subash's idea is to have such purifiers attached to public taps.

Source: <u>http://www.rediff.com/getahead/report/achievers-top-31-amazing-innova\_ons-from-young-Indians/20151208.htm</u>

#### Solarseeder

This is a story of a innova ve solar seeder and developed by Subash Chandra Bose, a dass 8, student from St Sebasthiyar Matricula on School, Pudukko ai, Tamil Nadu. Subash has developed a solar powered seed drill, which can undertake planta on for different size of seeds at variable depth and space between two seeds.

Source: <u>http://www.rediff.com/getahead/report/achievers-top-31-amazing-innova\_ons-from-young-Indians/20151208.htm</u>

#### 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 Matricula on, 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: <u>http://www.rediff.com/getahead/report/achievers-top-31-amazing-innova\_ons-from-young-Indians/20151208.htm</u>

Ask (ask)

- If they can, why can't you?
- Discuss concepts related to 'Crea vity and Innova on' with the par cipants as given in the Par cipant Handbook.

### Say 🤷

- Recall the stories on mo va on.
- What is the inner drive that mo vates people to succeed?
- Let's learn more about such crea ve and innova ve entrepreneurs with the help of an ac vity.

# - Team Ac vity 🕍

#### • Thisisagroupac vity.

Think of any one famous entrepreneur and write a fewlines about him or her.

#### Ac vity De-brief

- Why did you choose this par cular entrepreneur?
- What is his/her brand name?
- What crea vity does he/she possess?
- What was innova ve about their ideas?

# - Do 🗸

- Instruct the par cipants 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 par cipants they have to write a few lines about any one famous entrepreneur.
- Give the par cipants 10 minutes to discuss and write.
- Keep a check on me. Tell the group to wind up quickly if they go beyond the given me limit.
- Ask each group to read out what they have wri en.
- Ask the de-brief ques ons.

### Summarize 🏼

- Summarize the unit by asking par cipants if they know of some people who are highly crea ve and innova ve in their approach.
- Ask them to share some experiences about these people with the class.

# - Notes for Facilita on 🗐

Source for stories on innova ons:

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

Facilitator Guide

### UNIT 9.1.6: Time Management

Unit Objec ves 🦉

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

- Discuss the benefits of me management
- List the traits of e ec ve me managers
- Describe e ec ve me management techniques

# - Resources to be Used

Par cipant Handbook

Ask (ask)

Does this sound like you?

- I can never get enough me 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 me.
- I had so much to do, so I could not deliver that order on me.
- I would love to start my dream business; but, I just do not have the me.

# Example

Let'slook 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 rou ne. But there is a challenge and it is distrac on. As she works from home, she can easily just get up and sit down on the sofa to watch TV, was ng valuable me. 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 dients 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 fullme, 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 me away from the work. He is s II 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.



#### 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 di erent heading.
- At the heart of the urgent-important grid, are these two ques ons
  - o Is this task important?
  - o Is this task urgent?
- Now, you have to think about each ac vity 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
  - o This category is for the highest priority tasks. They need to get done now.
- Category 2: Not Urgent/Important
  - o This is where you want to spend most of your me.
  - This category allows you to work on something important and have the me to do it properly.
  - o This will help you produce high quality work in an e cient 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 direc on and planning all vital parts of running a successful business.
- Category 3: Urgent/Not Important
  - This is where you are busy but not produc ve. These tasks are o en mistaken to be important, when they're most o en busywork.
  - o Urgent but not important tasks are things that prevent you from achieving your goals.
  - o However, some may be ac vi es 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 me management.
  - o Some may be ac vi es that other people want you to do.
  - o These might include unplanned leisure ac vi es as well.

#### To – Do List Format

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#### URGENT-IMPORTANT GRID NOT URGENT/ IMPORTANT **URGENT/IMPORTANT** Planning • Mee ngs ٠ Working towards goals • Last minute demands • Building rela onship • Project deadlines Personal commitments • Crisis 1 2 3 4 • Interrup ons • Internet surfing Phone calls/ E-mails • Social media ٠ • Other people's minor demands • Watching TV **URGENT/ NOT IMPORTANT** NOT URGENT/ NOT IMPORTANT



### Do 🗠

- Put down the formats for the to-do list and the urgent/important grid on the board.
- Instruct the par cipants to prepare their to-do list first.
- Give the par cipants 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 par cipants giving examples specific to their context.
- As you explain the categories fill the grid with the type of tasks.
- Give the par cipants 40 minutes to fill the grid.
- Then explain how to balance the tasks between the four categories.
- Keep a check on me. Tell the group to wind up quickly if they go beyond the given me limit.

#### .

Sav

Ac vity De-brief:

How can we balance tasks between the four categories? How to manage me through this grid?

- Category 1: Urgent/Important
  - o Try to keep as few tasks as possible here, with the aim to eliminate.
  - If you spend too much of your me in this category, you are working solely as a trouble shooter, and never finding me to work on longer -term plans.
- Category 2: Not Urgent/Important
  - o Plan these tasks carefully and e ciently as they are most crucial ones for success.
  - If necessary, also plan where you will do these tasks, so that you're free from interrup ons.
  - Include strategic thinking, deciding on goals or general direc on and planning in your planning process.
- Category 3: Urgent/NotImportant
  - o Ask yourself whether you can reschedule or delegate them.
  - A common source of such ac vi es is other people. Some mes 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
  - o You also want to minimize the tasks that you have in this category.
  - o These ac vi es are just a distrac on avoid them if possible.
  - o 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 ac vi es carefully so that they don't have an impact on other important tasks.
- Discuss the traits of effec ve me managers and effec ve me management techniques as given in the Par cipant Handbook.

### Summarize 🖉

 Discuss the traits of effec ve me managers and effec ve me management techniques as given in the Par cipant Handbook.

### - Notes for Facilita on 📗

- Here is a short story. You can conclude the session narraing the story. To make it more interesing you can perform the demonstration described and discuss the short story.
  - One day an expert in me 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 me, 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 me, 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 0 the sand in the jar and it went into all of the spaces le between the rocks and the gravel. Once more he asked the gues on, "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 un I the jar was filled to the brim. Then he looked at the class and asked, "What is the point of this illustra on? "One student raised his hand and said, "No ma er 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 illustra on 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 educa on; your dreams; a worthy cause; teaching or mentoring others; doing things that you love; me 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 li le stu (the gravel, sand, and water) then you'll fill your life with li le things you worry about that don't really ma er, and you'll never have the me you need to spend on the big, important stu (the big rocks).
- End the story with these lines...

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

### UNIT 9.1.7: Anger Management

# Unit Objec ves 🧭

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

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

# - Resources to be Used

• Par cipant Handbook

- Ask 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 Par cipant Handbook.
- Let us do a small ac vity. This is an individual ac vity.
- Think of the incidents and situa ons that angered you and hurt you.

### Do 🗠

- Instruct them to note down these situal ons under dillerent categories (as given in the Ac vity).
- Give the class 3-5 minutes to think and note down their answers.
- At the end of 5 minutes, ask some par cipants to volunteer and present their answers.
- They can also share these situal ons with their fellow part cipants if they do not wish to share it with the entire class.

# - Ac vity 🖉

- Do you remember any incident which hashurt?
  - o you physically
  - o youmentally
  - o your career
  - o your rela onships.

# Ask (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 rela onship?
- Do you remember any incident where someone lost business/ friend/ rela onship due to temper (anger)?

### Say 5

- There are a few strategies which can help in controlling your anger. Let's do an ac vity to understand the anger management process be er.
- This is an individual ac vity.
- Think of the incidents/ situa ons which trigger your anger (the cause).
- Then think what happened as a result of your anger (the e ect).
- 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 ac vity.
- Put down the ac vity format (Anger Triggers, Result of your Anger, Anger Management Techniques) on the board and instruct the class to write the answers under di erent categories.
- Give the class 3-5 minutes to think and note down their answers.
- At the end of 5 minutes, ask the par cipants who wish to volunteer and present their answers.

### Ac vity 🖉

Trigger points and Anger Management Techniques Ac vity

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 뎙

- Now, let's discuss the problems and solu on with all.
- The individual will first briefly describe trigger points to the class.
- Then discuss the result of the anger. Other par cipants are requested to remain quiet while one is making the presenta on.
- Post presenta on, other par cipants may ask ques ons.

- Do 🗹

- Congratulate each individual for sharing their points.
- Ask the audience to applaud for them.
- Ask de-brief ques ons a er the presenta on to the class.
- Keep a check on the me. Ask the par cipants to wind up the ac vity quickly if they go beyond the given me limit.

Ask

De-briefques ons:

- In the situa on described by the presenter, who was at fault?
- Howcould you have handled this situa on alterna vely?

### - Summarize 🔎

- Close the discussion by summarizing the strategies and ps of anger management for entrepreneurs.
- Ask the par cipants what have they learnt from this exercise/ ac vity.
- Ask if they have any ques ons related to what they have talked about so far.

# Notes for Facilita on 🗐

- Encourage the par cipants to share informa on about them while presen ng the situa ons to the class.
- Keep the format of the Ac vity prepared in a chart paper so that it can be displayed during the session.

### UNIT 9.1.8: Stress Management: What is stress?



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

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

# Resources to be Used

Par cipant Handbook

Ask (ask)

- You are wai ng in the recep on for an interview or a very important mee ng, suddenly your legs are shaky, your hands are cold, you are feeling nervous. Have you ever been in this kind of situa on?
- 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 6

- 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 Par cipant 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 solu on to the problem.
- This will be a group ac vity.

# Do

- Divide the class into four groups of 5-6 par cipants (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 solu on to the given problem.
- Explain their discussion should result in get nganswers for the following ques ons:
  - What was/were the cause(s) of stress?
  - Was the stress avoidable or manageable under the given circumstances?
  - o If yes, how do you think that the stress could be avoided (managed)?
  - o If no, then why not?
- Give the class 10-12 minutes to discuss the case and note down their solu ons.
- At the end of 12 minutes, the team should present their case solu on 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 presenta on.

# · Team Ac vity 🕍

Case Study Analysis

#### Scenario 1

Akash's alarm doesn't go o and he gets late ge ng out of the house. He hits tra c and ends up 15 minutes late to work, which his boss no ces. 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 dient 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 posi on to a end the call or finish the reports on me.

#### Scenario 2

While paying his overdue bills, Rahul realised that it's the middle of the month and he has only Rs 500 le in his account. He has already asked all of his friends, and family for loans, which he hasn't paid back yet. He is s II contempla ng over the issue when his phone rings. His sister's birthday is due next week and she has seen a beau ful 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 tasksassigned. His team leader has already warned him of the delay.

#### Scenario 3

Sheela calls the cable company asshe has unknown charges on her bill. She has to go through the automated voice mail menu three mes and s II can't get through to a customer care execu ve. After 15 minutes of repeated efforts, her call is answered. She explains the en re issue to the customer care execu ve 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 execu ve. She is very angry and calls again but cannot connect this me.

She has to leave to office so she decides to call from office and check. When she connects this me, she is angry and argues with the execu ve on the call. All her co-workers around are looking at her as her volume hassuddenly 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 liabili es, 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 star ng a business when nobody ever in his family had been in business.

He has not been able to get a good deal II now. This is an important life shi 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 (ask)

De-briefques ons:

- 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 solu on with the larger group.
- The group will first briefly describe the case to the class.

- Then discuss the issue iden fied and the proposed solu on.
- Post presenta on, the other groups may ask ques ons to the group that has presented.

### Do 🗹

- Congratulate each group for sharing their points.
- Ask the audience to applaud for them.
- Ask de-brief ques ons to cull out the informa on from each group.
- Keep a check on me. Tell par cipants to wind up the discussion quickly if they go beyond the given me limit.

### Say 6

- 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 nega ve impact on your performance.
- Stress can deplete the most vibrant of souls. It can have a nega ve e ect on every aspect
  of a person's life including their health, emo onal well-being, rela onships, 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 me management and the habit of procras na ng. If Akash would have managed his me well, planned alternate ways to get up on me, finished prior tasks on me and planned for dient mee ngs 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, di eren a ng between needs and wants and keeping a check on non-essen al expenditure would have saved Rahul from this situa on.

#### Scenario 3

Some mes, 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 me, you will get in touch with a new execu ve and will have to explain all over again. This might cause stress but despite being frustrated and angry there is li le that we can do about it. All Sheela could do was to find ways to calm herself down through some breathing exercises and medita on, reading some good book or listening to music and then start afresh.

#### Scenario 4

A posi ve, 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 posi ve 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 par cipant who can volunteer and read out this scenario to the class.

#### Scenario 5

Rakesh lives in Kathmandu with his wife and two beau ful daughters Sarah and Sanya. Nepal was hit by a massive earthquake and Rakesh's building collapsed during the earthquake. During evacua on, 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 fran cally. 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 par cipant a er the scenario is read completely.
- Discuss the scenario, ask de-brief ques ons:
  - o What kind of stress was Rakesh undergoing in this case?
  - o Was the stress avoidable or manageable under the given circumstances?
  - o What was the result of the stress?

### Say 2

#### 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 adrenal ine is good for us.

# Summarize 🔎

- Close the discussion by summarizing the ps to manage stress as given in the Par cipant Handbook.
- · Ask the par cipants what they have learnt from this exercise/ ac vity.
- Ask if they have any ques ons related to what they have talked about so far.

# - Notes for Facilita on 🗐

- Keep printed copies of the ac vi es/ scenarios ready for the session.
- Put down the de-brief ques ons on a flip chart so that it can be displayed in the class during the ac vity.
- Encourage par cipa on and make the discussions interac ve.

# UNIT 9.2: Digital Literacy: A Recap

### Key Learning Outcomes 🖞

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

- 1. Iden fy the basic parts of a computer
- 2 Iden fy the basic parts of a keyboard
- 3. Recall basic computer terminology
- 4. Recall the func ons of basic computer keys
- 5. Discuss the main applica ons of MS O  $\,$  ce  $\,$
- 6. Discuss the benefits of Microso Outlook
- 7. Iden fy di erent 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

#### Facilitator Guide

# UNIT 9.2.1: Computer and Internet Basics: Basic Parts of a Computer

# Unit Objec ves 🦉

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

- Iden fy the basic parts of a computer
- Iden fy the basic parts of a keyboard
- Recall basic computer terminology
- Recall the func ons of basic computer keys

### Resources to be Used 🦉

- Par cipant Handbook
- · Computer Systems with the required applica ons

### Say 5

- 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 Par cipant Handbook.

Explain

• Explain all the parts of the computer and the keyboard by demonstraing 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 par cipants as given in the Par cipant Handbook.

### Summarize 🔎

- Ask the par cipants what they have learnt from this exercise/ ac vity.
- Ask if they have any ques ons related to what they have talked about so far.

Close the discussion by summarizing the importance of computer and internet for entrepreneurs.

 Prac cal 🕅
<ul> <li>Conduct a prac cal session.</li> <li>Ask the par cipants to assemble in the computer lab.</li> <li>Give some hands-on prac ce exercises.</li> </ul>
<ul> <li>Group the par cipants for the ac vity depending on the batch size and the number of computer systems available in the lab.</li> <li>Explain the purpose and dura on of the ac vity.</li> <li>Ensure the par cipants complete the prac cal exercises assigned.</li> </ul>



### UNIT 9.2.2: MS Office and Email: About MS Office

### - Unit Objec ve 🤎

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

- Discuss the main applica ons of MSO ce
- Discuss the benefits of Microso Outlook

# - Resources to be Used

- Par cipant Handbook
- · Computer Systems with the required applica ons

Ask ask

- What is the most frequent ac vity that you do on the computer?
- Do you know how to make presenta ons on the computer?

# Say 🤷

- Give a brief introduc on of MSO ce as given in the Par cipant Handbook.
- Discuss the most popular o ce products. Explain in brief their applica on, benefits and working.
- Microso Word is a word processing program that allows for the crea on of documents. The program is equipped with templates for quick forma ng. There are also features that allow you to add graphics, tables, etc.
- Microso Excel is a tool for accouning 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
  calcula ons 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
  mull ple pages in each workbook. Each page, or sheet, is called a Worksheet. When you
  open a new Excel file, it automa cally 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 o en do you check your e-mails?



Askiftheyhave

#### Facilitator Guide

### UNIT 9.2.3: E-Commerce

Unit Objec ve

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

- Iden fy di erent 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 connec on
- Par cipant 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 introduc on of "What is E-commerce". Refer to the Par cipant 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, dothes, entertainment, furniture and many other items can be purchased online.

Ask ask

• What other types of transac ons have you performed on the internet other than buying products?

Sav Sav

• Give examples of e-commerce ac vi esfrom Par cipant Handbook.

# Team Ac vity

E-commerce examples

 Instruct the par cipants to list some of the payment gateways that they have used for ecommerce ac vi es.

- Give them 5 minutes to make this list.
- Discuss payment gateways and transac on through payment gateways.
- Conclude the discussion by men oning how important e-commerce has become in our day to day transac ons.

# • E-commerce ac vi es can be classified based on the types of par cipants in the transac on.

• Discuss "Types of E-commerce" from the Par cipant Handbook.

### Do 🗅

- Discuss all types of E-commerce by giving examples and names of some popular websites which use them.
- Make the discussion interac ve by asking the class to share some popular e-commerce sites of each type.

Say 6

- E-commerce ac vi es bring a host of benefits for both, retailers and customers.
- Discuss benefits of E-commerce from the Par cipant Handbook.

# Explain

- The majority of the popula on that uses E-commerce ac vi es lives in er-1 and er-2 ci es. To encourage the use of digital money in er-3 and 4 areas, PM Mr. Modi launched the "Digital India Campaign".
- Discuss "Digital India Campaign" from the Par cipant Handbook.
- By Digital India project the government will deliver services via mobile connec vity and in doing so, is expected to bring the internet and broadband to remote corners of the country. This connec vity will in turn enhance e-commerce ac vi es also. Furthermore, the Indian Government is also modernizing India Post and aims to develop it as a distribu on channel for e-commerce related services.

# Say 6

- Now let us discuss how to sell a product using E-commerce.
- Every product has to be sold on a pla orm 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 mul ple sellers in that shop. A common example is a departmental store which has products from mul ple 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:
  - o Developing the website
  - o Hos ng the website
  - o Maintenance of the website
- If you rent a website it will also showcase your own products but the development, hos ng and maintenance parts goes to the owner. This saves me and the cost to manage these ac vi es.
- Smaller companies usually go for ren ng a website and the bigger ones develop their own website.
- The concept of shared pla orms has become very popular in recent mes. In this pla orm, the sellers have to register and then they can sell their goods on a common pla orm. Among the most popular of these are Amazon, Myntra, Flipkart, etc.

### - Role Play 💆

- Tell the par cipan ts to choose a product or service that they want to sell online.
- Tell them to write a brief note explaining how they will use exis ng e -commerce pla orms, or create a new e commerce pla orm 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 6
- Demone za on has made carrying cash in the wallet very di cult. 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 demone za on. 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.



- Ask if they have any ques ons related to what they have talked about so far.
- Close the discussion by summarizing the importance of e-commerce and digital money.

Facilitator Guide

# UNIT 9.3: Money Matters

Key Learning Outcomes 🖞

At the end of this unit, par cipants 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. Di eren ate between fixed and variable costs
- 6. Describe the main types of investment op ons
- 7. Describe the di erent types of insurance products
- 8. Describe the di erent types of taxes
- 9. Discuss the uses of online banking
- 10. Discuss the main types of electronic funds transfer

### UNIT 9.3.1: Personal Finance - Why to Save?

# - Unit Objec ve 🤘

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

- Discuss the importance of saving money
- Discuss the benefits of saving money

# Resources to be Used

• Par cipant 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'slook 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 iden fy 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 par cipants as given in the Par cipant Handbook.

### - Ask 🖻

- What are the benefits of saving money?
- What does being financially independent mean to you?

### Say 🤷

- Discuss "Benefits of Saving" with the par cipants as given in the Par cipant Handbook.
- Now let us con nue 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 notkept any record and nowshe 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 be er and more e ec ve manner?
- Do you want to learn how to save money and use it e ec vely?

Say 🤦

• Let's learn personal saving with the help of a group ac vity.


You can summarize the session by discussing:

- The importance of savingmoney.
- Ways to save money.
- How the money saved can be used for different purposes.

#### Facilitator Guide

# UNIT 9.3.2: Types of Bank Accounts, Opening a Bank Account

# - Unit Objec ve 🤘

At the end of this unit, par cipants 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
- Par cipant Handbook

Ask 🔎

- Howmany of you save money?
- Where do you keep the money you save?
- Howmany of you have a bank account?
- What type of account do you have?

#### Example

2

Ask

Let'slook at the given example:

Reena is in the third year of college but in the evening, she gives tui ons for children living in her colony. She earns 15,000/- per month. As her students stay in di erent parts of the city, she has to walk a lot.

To save me, 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.

• Do you try to save money monthly but have to spend it on unforeseen expenditure?

Have you ever thought of deposi ng your savings in a bank?



# Team Ac vity 😫

#### Opening a Bank Account

- This ac vity 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 sec on "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.

#### Ac vity 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 ac vity help you in future?

#### · Do 🗅

- Instruct the par cipants to read the sec on "Opening a Bank Account' of the Par cipant Handbook.
- Give each group one sample account opening form.
- Give the par cipants 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 me.
- Tell the group to wind up quickly if they go beyond the given me limit

#### - Summarize 🏼

#### Note:

- You can summarize the unit through a role play.
  - o A person wan ng to open an account in the bank.
  - What is the procedure that he will go through?
  - o Discuss the key points of di erent types of bank accounts.
  - o How to select the type of account
  - o How to fill the account opening form.

<ul> <li>A sample account opening form is given in the following page for reference. Use it for the ac vity in the class.</li> <li>Sample Bank Account Opening form.</li> </ul>						
Photograph			XXX Bank			
	SAVING BAN	K ACCOUNT OPE	INING FORM			
Account No.:			Date:			
Name of the Branch						
Village/Town						
Sub District / Block	<					
District						
State						
SSA Code / Ward No.						
Village Code / Towr	1	Name of Villa	age /			
Code		Town				
Applicant Details:						
Full Name Mr./Mrs./	First	Middle	Last Name			
Marital Status	TH St	Widdle	Edithume			
Name of						
Spouse/Father						
Address						
Pin Code						
Tel No. Mobile			Date of Birth			
Aadhaar No.			Pan No.			
MNREGA Job Card No.						
Occupa on/Profession						
Annual Income						
No. of Dependents						

Facilitator Guide

Detail of Assets	Owning Hous Y/N No. of Animal		Y/N	Owning Farm Any other	1
Existing Bank A/c. of family members / household		/ N	If	yes, No. of A/cs	
Kisan Credit Card	Whether Eligi	ble	Y/N		
request you to is	sue me a Rupa	ay Card			
needs subject to	the condition aft facility. I sh	that on	ly one mem	meeting my emerg ber from the hous ms and conditions	ehold will be
				be in force from ti	
declare that I have Place: Date:				be in force from ti it facility from any o Signature / LTI o	ther bank.
declare that I have Place: Date: Nomination:	e not availed ar			it facility from any o	ther bank.
	e not availed ar			it facility from any o	ther bank. <b>If Applicant</b> d in case to nount of half of the event of my
declare that I have Place: Date: Nomination: I want to nomin Name of	e not availed ar	ny Over	draft or Cred Date of Birth in case of	Signature / LTI o Signature / LTI o Person authorise receive the ar deposit on beh nominee in the e	ther bank. <b>If Applicant</b> d in case to nount of half of the event of my
declare that I have Place: Date: Nomination: I want to nomin Name of	e not availed ar	ny Over	draft or Cred Date of Birth in case of	Signature / LTI o Signature / LTI o Person authorise receive the ar deposit on beh nominee in the e	ther bank. <b>If Applicant</b> d in case to nount of half of the event of my leath.

#### UNIT 9.3.3: Costs: Fixed vs. Variables: What are Fixed and Variable Costs? Unit Objec ve At the end of this unit, par cipants will be able to: • Di eren ate between fixed and variable costs Resources to be Used Par cipant Handbook Blank sheets of paper ٠ Pens Ask What is cost? . Will a telephone bill fall under the category of a fixed or variable cost? • Sav Discuss: Fixed and Variable cost with examples. Let us do a small ac vity. Team Ac vity 🕍 Iden fy the type of cost 1. Rent 2. Telephone bill 3. Electricity bill 4. Machinery 5. Insurance 6. Office supplies/Rawmaterials 7. Employee salaries 8. Commission percentage given to sales person for every unit sold 9. Credit card fees

10. Vendorbills



- 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 di eren ate between the fixed and variable cost.

#### Ac vity De-brief

- What is the total cost of your business?
- What are the fixed costs?
- What are the variable costs?
- · How did you di eren ate between the fixed and variab le costs?

# - Do 🗹

- Instruct the par cipants that this is group work.
- Divide the class into small groups of 4 or 6.
- Give each group a sheet of paper.
- Tell the par cipants that they have to start their own entrepreneur business.
- Ask them the type of business they want to start.
- Instruct them to di eren ate between the fixed and the variable costs of the business they want to start.
- Give the par cipants 15 minutes to discuss and write.
- Keep a check on me. Tell the group to wind up quickly if they go be yond the given me 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 Facilita on 🗐

	Answersfor the ac vity-Iden fy the type of cost	
1.	Rent	(Fixed)
2	Telephone bill	(Fixed)
З.	Electricity bill	(Fixed)
4.	Machinery	(Fixed)
5.	Insurance	(Fixed)
6.	O ce supplies/ Raw materials	(Variable)
7.	Employee salaries	(Fixed)
8.	Commision percentage given to sales person for every unit sold	(Variable)
9.	Credit card fees	(Variable)
10.	Vendor bills	(Variable)

Facilitator Guide

#### UNIT 9.3.4: Investments, Insurance and Taxes

### Unit Objec ve 🦉

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

- · Describe the main types of investment op ons
- Describe the di erent types of insurance products
- Describe the di erent types of taxes

# Resources to be Used

• Par cipant Handbook

Ask 🗣

- Ask the par cipants- "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 educa on.

Shivani is working in a corporate office and get ng 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.

• Discuss the Investment, Insurance and Taxes as given in the Par cipant Handbook.



5.	Who is the buyer of stocks and equies? 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 securi es on behalf of investors. Hedge funds invest in both financial deriva ves and/or publicly traded securi es.
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 protec on 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 dura on 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? Securi es Transac on 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 impor ng or purchasing goods from another country. OCTROI is levied on goods that crossborders within India.

#### UNIT 9.3.5: Online Banking, NEFT, RTGS, etc.

# - Unit Objec ve 🤘

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

- Discuss the uses of online banking
- Discuss the main types of electronic funds transfer

### - Resources to be Used 🖉

- Par cipant Handbook
- Computer System with internet connec on
- Debit card

### Ask 🔎

- When was the last me 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 Say

- Most of us lead a busy life. Time has become more important than money. In this busy schedule, no one has me 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 transac ons through the internet.
- Discuss "What is online banking?" from the Par cipant Handbook.
- There are various advantages of online banking:
  - o It saves me, as you need to visit the branch.
  - You can conduct your banking transac ons safely and securely without leaving the comfort of your home.
  - o Online Banking also gives you round the dock access.
  - o 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:
  - o Through their website set-up your online account.

- o Choose a secure username and password.
- o Set-up your contact informa on.
- o Once your informa on 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 o ers, as discussed earlier, is transferring money from one account to another. This transac on 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 me, thus saving me and e ort involved in physically transferring a sum of money.
- Discuss "Electronic Funds Transfer" from the Par cipant 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 par cipants if they have any ques ons related to what they have talked about so far.

### UNIT 9.4: Preparing for Employment & Self-Employment

Key Learning Outcomes 🦉

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

- 1. Discuss the steps to follow to prepare for an interview
- 2 Discuss the steps to create an effec ve Resume
- 3. Discuss the most frequently asked interview ques ons
- 4. Discuss how to answer the most frequently asked interview ques ons
- 5. Iden fy basic workplace terminology

#### Facilitator Guide



- Once he/she is done, ask the rest of the par cipant what they gathered about the par cipant who was providing informa on.
- Now repeat the exercise with five other par cipants.





# UNIT 9.4.2: Preparing an Effec ve Resume: How to Create an E ec ve Resume?

- Unit Objec ve 🦉

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

• Discuss the steps to create an effec ve Resume

### - Resources to be Used

- Par cipant 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 qualifica ons 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 crea ng an e ec ve/a rac ve resume discussed in the Par cipant Handbook.
- Now let's prepare a resume to understand the processin a better way.

#### Do

- This is an individual ac vity.
- Give the details of the ac vity.
- Instruct them to read the ac vity carefully.
- The par cipant is expected to make an a rac ve resume based on the informa on provided.
- Give the class 25-30 minutes to study the case and create a resume.
- At the end of 30 minutes, the par cipants should exchange the resume with the person sing next to him or her.
- Every par cipant will evaluate the resume prepared with their fellow par cipants.

### Say 🖻

- Do you think the candidate should apply for the job pos ng described in the adver sement?
- We have already discussed the steps involved in crea ng an e ec ve/a rac ve resume.
- Now let's prepare a resume for the candidate details given in the ac vity.

# - Ac vity 🖉

Case Study Analysis

- In the first sec on of the ac vity, you are being given the informa on about a candidate who is applying for a par cular job.
- In the second sec on, you are being given the detailed descrip on of the job pos ng. Create a resume for the candidate to apply for the job pos ng.
- Use the informa on 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 988XXXX01, 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 pain ng and watching old Hindi movies. As part of a school charity program, he volunteered at the children'shospital duringhissenior years.

In July 2007, he joined Westwood School of Hotel Management, Zirakpur to pursue a diploma course in Hotel Management and Catering. After comple ng 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 deanliness and maintenance of one floor in the hotel. Taking advantage of his strong interpersonal skills, he also got opportuni es to make housekeeping arrangements for corporate mee ngs. While pursuing education, he gained working knowledge of Microso Word, Excel, Accessand 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 comple ng the internship, his objec ve 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 housekeepingassistant.

#### Job Pos ng

\*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 interna onal brand to celebrate and explore Amritsar. *Salary:* Nego able

Industry: Travel / Hotels / Restaurants / Airlines / Railways

Func onal Area: Hotels, Restaurants

Role Category: Housekeeping

Role: Housekeeping Execu ve/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 communica on skills, English is a must.

In return we'll give you a compe ve 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 ushowyou could bring your individual skills to IHG. Educa on-*UG:* Any Graduate/Diploma holder

PG: PostGradua on NotRequired

# Say 6

 Now, let's share the resume with the fellowpar cipant sit ng next to you and evaluate each other's effort.

### 

- Congratulate each par cipant for making their first a empt towards crea ng an e ec ve resume.
- As a followup ac vity, you can suggest them to prepare their own resume and showit to you the next day.

#### .Summarize 🏼

- Close the discussion by showing some e ec ve resume samples to the candidates.
- Ask the par cipants what they have learnt from this ac vity.
- Ask if they have any ques ons related to what they have talked about so far.

### Notes for Facilita on 🗐

- Keep printed copies of the ac vity 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 par cipants' 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: nxxxxxxxla@gmail.com

Objec ve: Seeking an opportunity to use my interpersonal skills and experience to contribute to your company's growth, profitability and objec ves.

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 mul -cultural environment
- Detail oriented, flexible, and adaptable
- Knowledge of Microso Word, Excel, Access and PowerPoint

Educa onal 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 deanliness and maintenance of one floor in the hotel.
  - o Got opportuni es to make housekeeping arrangements for corporate mee ngs.

Volunteer Work:

• Student volunteer at children's hospital in Chandigarh.

Nipesh Singla

Facilitator Guide

### UNIT 9.4.3: Interview FAQs

### - UnitObjec ve 🤎

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

- Discuss the most frequently asked interview ques ons
- · Discuss how to answer the most frequently asked interview ques ons

# Resources to be Used

• Par cipant Handbook

Sav

- Tell the par cipants you will provide them with interview situa on and ques ons and they have to try to answer them.
- Tell them you will also explain the different ways to approach these ques ons.

### - Do 🗹

- Divide the class in pairs and ask the par cipants 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 pa ern for all other situa ons.
- Time allo ed for each situa on is 8-10 minutes.
- · Congratulate each par cipant for giving their input.
- · Ask the class to applaud each me a team has completed their role play.
- Keep a check on me.

#### 🛛 Role Play 💆

Conduct a role play for the situa on given.

Situa on 1

- The interviewer will start by asking the interviewee a few generic ques ons such as
  - o What is your name?
  - o Tell me something about yourself?
  - o Can you tell me something about your family?

- Then, the interviewer will bluntly ask the following ques ons:
  - How do you explain this huge me gap in your resume?
  - o What is the reason for this?
  - Weren't you looking for a job or is it that no one selected you?

# Say G

#### De-brief:

- When you put informa on on your resume, you should be prepared to answer any ques ons about it.
- Be present and focused on the ques ons being asked to you.
- One way of tackling the blunt ques ons is to tell the interviewer you did not come across an opportunity where you were su ciently sa sfied with both the remunera on o ered 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 situa on given.

Role Play-Situa on 2

- The interviewer will start by asking the interviewee a few generic ques on ssuch as
  - o What is your name?
  - o Tell me something about yourself?
  - o 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?

Sav

De-brief:

- There is nothing wrong with sta ng your strengths and achievements. However, do not come across as arrogant or too boas ul.
- You need show the interviewee that you have unique skills or tale nts 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 situa on given.

Role Play-Situa on 3

- The interviewer will start by asking the interviewee a few generic ques on such as
  - o What is your name?
  - o Tell me something about yourself?
  - o Can you tell me something about your family?
  - Then, lean forward, dasp your hands on the table and in a so 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 favouri sm?

Say 1

De-brief:

- Keep this in mind: Do not cri cize 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 construc ve and neutral.
- Since cri cism will show you in nega ve light, you should keep your answers honest yet diploma c.
- You can tackle such ques ons by saying, "I got along well with most of my faculty and peers."
- Role Play 💆

Conduct a role play for the situa on given.

Role Play-Situa on 4

- The interviewer will start by asking the interviewee a few generic ques on ssuch as
  - What is your name?
  - Tell me something about yourself?
  - o Can you tell me something about your family?
- Then very bluntly ask the interviewee:
  - o Howlong do you plan to stay with this company if you are selected?
- After the candidate responds, ask sarcas cally:
  - o Do you seriously mean that?

Say 1

De-brief:

- Don't provide unreal and idealis canswers.
- Your answers should be honest yet diploma c. In a situa on like this, the interviewer does not expect you to provide a specific meline.

• You can say something like, "I would like to stay with the company as long as I can contribute construc vely and develop as an employee, within the organiza on, professionally and financially."

Role Play 🛽

Conduct a role play for the situa on given.

Role Play-Situa on 5

- The interviewer will start by asking the interviewee a few generic question on such as:
   What is your name?
  - o Tell me something about yourself?
  - o Can you tell me something about your family?
- · Ask him/her howimportant he/she thinks it is to be punctual in the corporate world.
- A er 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 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 ac ons should be in line with this statement.
- Avoid giving any excuses.
- You might feel obligated to provide a jus fica on 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 situa on given. Role Play-Situa on 6

- The interviewer will start by asking the interviewee a few generic ques ons such as
  - What is your name?
  - o Tell me something about yourself?
  - o Can you tell me something about your family?
  - After asking a few academic or job-related ques ons, ask the interviewee:
    - o 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 ques on, respond to the interviewer by providing a reasonable and well-thought out salary range.
- Role Play 💆

Conduct a role play for the situa on given.

- Role Play-Situa on 7
- The interviewer will start by asking the interviewee a few generic ques ons such as
  - o What is your name?
  - o Tell me something about yourself?
  - o Can you tell me something about your family?
- Then, bringing the interview to a close, ask the interviewee:
  - o Do you have any ques ons for me?

### Say 🤷

#### De-brief:

- Ask relevant ques ons.
- Don't bombard the interviewer with ques ons.
- If you have ques ons about the result of the interview, you can limit your ques ons 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 par cipants to be prepared for answering di erent types of ques ons 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 par cular ques on.
- Try to keep your ac ons, tone, and gestures neutral.
- Maintain your composure while answering personal ques on.

# Do 🗹

- Tell all the par cipants to form pairs again.
- Tell them to use the following list of frequently asked intervie wques ons to conduct mock interviews.

- They will use all or some of these ques ons 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.
- A er they are through asking and answering the ques ons, the roles will be reversed.
- The same list of ques ons will be used again.
- A er each mock interview ask the interviewer to provide feedback and clear any doubts that may arise.
- Time allo ed for each situa on is 30-35 minutes.

MockInterviewQues ons

Ac vity

Mock Interview Ques ons

Tell me something about your family.

What quali es would you look for in a Manager or a Supervisor?

Why did you apply for this job?

What do you know about this company?

How do you deal with cri cism?

How do you plan to strike a good work-life balance?

Where do you see yourself five years from now?

Have you applied for jobs in other companies?

What kind of salary do you expect from this job?

Do you have any ques ons for me?

### Summarize 🔎

- · Close the discussion by discussing the ques ons in the both ac vi es.
- Ask the par cipants what they have learned from this ac vity.
- Ask if they have any ques ons related to what they have talked about so far.





Do

# • Instruct the par cipants 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 wri en on the chart, they have to make a flow chart of the hiring process of the MND Company.
- Give them 10 minutes for this ac vity.
- Keep a check on me. Tell the group to wind up quickly if they go beyond the given me limit.

### Say 🗣

Let'sgo ahead with the ac vity.

### Team Ac vity 🟙

Terms and Terminology

• The ac vity con nues 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 darified. Can you think of the terms for which she wants darity? Make a list of those words.

Ac vity De-brief

 Ask the groups to share their list of words. Some of the words are benefits, comp. me, deduc on, employee training, holidays, lay-o, leave, maternity leave, mentor, no ce, paternity leave, and me sheet.

#### Do 🗠

- Instruct the par cipants to iden fy the key terms an employee of a company should know. They can use the same chart paper for this ac vity.
- Give them 5 minutes for this ac vity.
- Keep a check on me. Tell the group to wind up quickly if they go beyond the given me 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 9.5: Understanding Entrepreneurship

### Key Learning Outcomes 💈

#### At the end of this unit, par cipants will be able to:

- 1. Discuss the concept of entrepreneurship
- 2 Discuss the importance of entrepreneurship
- 3. Describe the characteris csof an entrepreneur
- 4. Describe the different types of enterprises
- 5. List the quali esofan effec ve leader
- 6. Discuss the benefits of effec ve leadership
- 7. List the traits of an effec ve team
- 8. Discuss the importance of listening effec vely
- 9. Discusshow to listen effec vely
- 10. Discuss the importance of speaking effec vely
- 11. Discusshow to speak effec vely
- 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 nego a on
- 16. Discusshow to nego ate
- 17. Discusshowtoiden fynewbusinessopportuni es
- 18. Discusshowtoiden fybusinessopportuni eswithin your business
- 19. Explain the meaning of entrepreneur
- 20. Describe the different types of entrepreneurs
- 21. List the characteris csofentrepreneurs
- 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. Discusskey schemes to promote entrepreneurs
- 27. Discuss the rela onship between entrepreneurship and risk appete
- 28. Discuss the rela onship between entrepreneurship and resilience
- 29. Describe the characteris csofa resilient entrepreneur
- 30. Discuss how to deal with failure





# Unit Objec ves 🦉

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

- Discuss the concept of entrepreneurship
- Discuss the importance of entrepreneurship
- Discuss the characteris cs of an entrepreneur
- Describe the di erent types of enterprises

# - Resources to be Used

Par cipant Handbook

Say 🧣

· Let's start this session with some interesing quesions about Indian entrepreneurs.

### Team Ac vity 🕍 Quiz Ques ons 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 (autorickshawaggregator) 7. Who is the founder of OYO Rooms? Bhavish Aggarwal Do

• Tell them that you will ask them few ques ons about a few entrepreneurs.

- Divide the class in to two groups.
- In turns ask the quiz ques ons to the groups.
- If the answer is incorrect pass the ques on to the other group.
- Share the answer if the groups are not able to answer.
- · Congratulate the par cipants who answered correctly.

# Ask (ask)

- What do you understand by entrepreneurs?
- What is the importance of entrepreneurship in today's scenario?
- What do you think are the characteris cs of successful entrepreneurs?
- What are di erent types of enterprises that an entrepreneur in India can own and run?

#### Say 🔎

- Talk about entrepreneurs, importance of entrepreneurship, characteris cs of successful entrepreneurs, and di erent types of enterprises in India as discussed in the Par cipant Handbook.
- Tell the par cipants, 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 opportuni es for entrepreneurs in India.

# - Notes for Facilita on 🗐

- Check out di erent Government schemes for small entrepreneurs. Share the informa on with the par cipants.
- You can tell them about the government websites like Start Up India, mudra.org.in etc.
- Discuss about various schemes and policies by the Government of India for entrepreneurs.



### UNIT 9.5.2: Leadership and Teamwork

# Unit Objec ves 🦉

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

- List the quali es of an e ec ve leader
- Discuss the benefits of e ec ve leadership
- List the traits of an e ec ve team

# Resources to be Used

- Par cipant 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 a er seeing the picture.
- Now ask them, "What do you understand from this picture?"
- Encourage par cipants to share their thoughts.



Fig 9.5.1: Sharing thoughts

### Say 🦻

- This picture depicts the quali es of a leader and the di erence 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.


- Discuss that the objec ve of this ac vity was to open communica on channels and how this has been achieved.
- The par cipants should aim to keep the communical on channels open when interacing with their peers and team members.
- It will set the pace and enthusiasm required for all the ensuing teamwork ac vi es.
- Talk about teamwork and importance of teamwork in entrepreneurial success as discussed in the Par cipant 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 general ng more number of solul ons to a problem and developing improved communical on amongst employees.
- Ask the par cipants what they have learned from these exercises.
- Ask if they have any ques ons related to what they have talked about so far.

UNIT 9.5.3: Communica on Skills: Listening & Speaking: The Importance of Listening E ec vely
Unit Objec ves       Image: Comparison of the second
Resources to be Used     Par cipant Handbook
Ac vity Ac vity - Chinese Whisper Step 1: Form a circle.
Step 2: Start a whisper chain. Any one par cipant will whisper a message into his/her neighbour's ear. No one else must hear the message. The message can be serious or downright silly.
Step 3: The next person who first heard the message should whisper the message very quickly to the person sit ng next to them.
Step 4: The game goes on un 1 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 ask
<ul><li>De-brief ques ons:</li><li>Was the original message the same as the message that is communicated at the end of the game?</li></ul>

• Why do you think there was a di erence in the messages?

## - Say 🖻

- No, the original message was not same at the end of game.
- The barriers to communica on like language, disturbance and noise, poor listening skills, boredom, poor speaking skills, etc. are the poten al reasons this happens.

- There are various aspects to communica on. Speaking skills and listening skills are two major components to any communica on. There is always some room for improvement in the way we communicate.
- It is important to accept the reality of miscommunica on and work to minimise its nega ve impacts.
- Communica on is a two-way process where people exchange informa on or express their thoughts and feelings
- It involves e ec ve speaking and e ec ve listening.
- If I go to the store to get bread, I exchange money for the bread. I give something and get something in return.
- Communica on takes place in the same manner. You have to provide and receive informa on for communica on to take place.

Ask (ask)

Say

- How o en do you hear these statements?
  - o "You're not listening to me!"
  - o "Why don't you let me finish what I'm saying?"
  - o "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 e ec vely as discussed in the Par cipant Handbook.

Say ᅝ

• Let'splay a game to understand effec ve listening process better.

- Do 🗸

- This is a class ac vity.
- The par cipants need to answer the ques ons they hear.
- Instruct them to listen carefully.
- You will read it at a stretch and if need be repeat it once more.
- Tell the par cipants to raise their hand if they know the answer to the ques on asked.
- Keep a check on me.

# - Ac vity 🖉

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, howmany 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 wasa e or dispute. Howis 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 uniden fied 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 door bell. What is the colour of the bear?

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 s II 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 direc on is in South.

Answers:

Ask 🔍

De-brief ques on:

- What were the barriers that came into your way of listening?
- How can you overcome barriers to listening?

## Say 🦻

- There is a di erence 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 e ec vely and carefully without making assump ons.

## • Ac vity 🛓

#### Elevator Pitch:

You are in the li of a hotel and you bumped into your former dient who is a famous businessman. He has financed a lot of small business ventures and can finance your new startup too. A er 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 mee ng is called, and he is on his way. If you would been be er prepared, you're sure that he would have stayed long enough to schedule a mee ng with you too.

If you were given another chance, what would you have said to this person?

Do 🗠

- Start o the task by providing a beginning sentence to get the story started, and then go around the classroom ge ng each one to add a new sentence to keep the story going.
- This task should be done spontaneously allowing only a li le me to think (30 seconds).
- For example: There was once a student who was looking for a job a er gradua on.

## Notes for Facilita on 🖳

- Tell the par cipants 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. Iden fy Your Goal: Start by thinking about the objec ve of your pitch. For instance, do you want to tell the poten al dients about your organiza on? Do you have a great new product idea that you want to pitch to an execu ve 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 organiza on does. Focus on the problems that you solve and how you help people. Ask yourself this ques on as you start wring: 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 proposi on or USP. Iden fy what makes you, your organiza on or

your idea unique. You'll want to communicate your USP after you've talked about what you do.

- 4. Engage with a Ques on: After you communicate your USP, you need to engage your audience. To do this, prepare open-ended ques ons (ques ons that can't be answered with a "yes" or "no" answer) to involve them in the conversa on. Make sure that you're able to answer any ques ons that he or she may have.
- 5. Put it all Together: When you've completed each sec on of your pitch, put it all together. Then, read it aloud and use a stopwatch to me how long it takes. It should be no longer than 20-30 seconds. Remember, the shorter it is, the better! Example:

Here's howyour pitch could come together:

"My company deals with cloth retail online business and we use various ecommerce platforms to sell our products. This means that you can do shopping with ease and spend me 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 dients are happy with our products. So, how can you help us in crea ng our own web portal?

6. Prac ce: Like anything else, prac ce makes perfect. Remember, how you say it is just as important as what you say. If you don't prac ce, it's likely that you'll talk too fast, sound unnatural or forget important elements of your pitch. Set a goal to prac ce your pitch regularly. The more you prac ce, the more natural your pitch will become. Prac ce in front of a mirror or in front of colleagues un 1 the pitch feels natural.

- Summarize 🔎

• Close the discussion by summarizing how to speak e ec vely as discussed in the Par cipant Handbook.









#### Nego a on Scenario 1

have interviewed a prospec ve 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

You

plan. Finances are ght, yet you believe this person could make a significant impact on future profits. If youpaid the required salary for the new person, then you would have to restructure your en re business plan. You've been searching for an individual with this skill level for three months to the candidate is wai ng for your response. Now you have to call him in to make the final nego a ons.

#### Nego a on 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 le er saying that your loan applica on has been rejected as your start up idea did not appeal to the bank and they think that it is not a revenue genera ng model. You have taken an appointment to meet the manager and show your nego a on skills to get your loan approved.

# Notes for Facilita on 🗐

Facilita ng Role Plays

Preparing for the ac vity

- 1. Carefully review the details of the scenario and the character descrip ons.
- 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 situa ons depicted in the role-plays.
- 4. An cipate and knowhow to address issues par cipants might raise during the ac vity. Conduc ng the ac vity
- 1. Introduce the ac vity. Emphasize that role-playing provides par cipants with an opportunity to apply their newknowledge, skills, and tools in situa onsthat simulate actual interac ons with customers.
- 2 Ask par cipants to form pairs. Direct the members of each group to choose who will play the roles. Remind the groups that each par cipant should be given the opportunity to play/prac ce the different roles.
- 3. Conduct a demonstra on so that par cipants become familiar with the expecta ons related to the roles and support materials.
- 4. Give the pairs/groups10 to 15 minutes to conduct the role-play (depending on the dura on of the session).
- 5. After all the groups have finished with the role-play, conduct a debriefing session on each role-play.
- 6. Ask the groups to take five minutes to talk about what happened during the role-play. The groups should discuss the questions given in the debriefing for each role-play.

Encourage par cipants to provide construc vecri cism during their discussions.

Summarize

• Wrap the unit up a er summarizing the key points and answering ques ons.

Facilitator Guide



r Ac vity 🖗	
Do your SWOT analysis	
Strength What are your strengths? What unique capabili es do you possess? What do you do better than others? What do othersperceive as your strengths?	Weakness What are your weaknesses? What do your compe tors do better than you?
Opportunity What trendsmay posi vely impact you? What opportuni esare available to you?	Threat Do you have solid financial support? What trends may nega vely impact you?

## Do 🗸

- Congratulate everyone for the class ac vity.
- Ask the audience to applaud for themselves.
- Allot the par cipants su cient me to complete this ac vity, but do keep a check on me.
- Ask de-brief ques ons to cull out informa on from the par cipants.



De-brief ques ons:

- 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 iden fy business opportuni es within your business.
- Ask the par cipants what they have learned from this exercise.
- Ask if they have any ques ons related to what they have talked about so far.

#### Facilitator Guide

## UNIT 9.5.6: Entrepreneurship Support Eco-System

## - Unit Objec ves 🧖

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

- Explain the meaning of entrepreneur
- Describe the di erent types of entrepreneurs
- List the characteris cs 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

- Par cipant Handbook
- Chart papers
- Marker pens
- Pencils
- Colour pencils
- Scale
- Eraser
- Other requisite sta onery 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 Par cipant Handbook

## Ask

- Can you define entrepreneurship support eco-system?
- What are the key domains of the support eco-system?



# - Team Ac vity 🔛

• Presenta on on key schemes to promote entrepreneurs

#### Do 🗠

- Divide the dass 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 dura on of the ac vity.
- Go around checking the progress of each group.
- Set guidelines pertaining to discipline and expected tasks.

Ac vity 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 ques ons the par cipants may have.

### UNIT 9.5.7: Risk Appe te & Resilience

Ø

# Unit Objec ves 🦉

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

- Discuss the rela onship between entrepreneurship and risk appete
- Discuss the rela onship between entrepreneurship and resilience
- Describe the characteris cs of a resilient entrepreneur

# Resources to be Used

- Par cipant Handbook
- Chart papers
- Blank sheets of paper
- Pens
- Marker pens

Ask (ask)

- Can you define risk or explain what cons tutes a risk?
- What do you people mean when they say, "This may be a risky proposi on"?
- 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 a er Rampur was in a bad condi on. They advised him to take a shortcut and turn le from Moradabad and take the Kaladhungi road. This road is in a be er condi on.

Since he was going with his family, and did want to take the risk of ge ng lost, he le early. He took the Kaladhungi road and reached Nainital well in me.

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 le from Moradabad and take the Kaladhungi road as this road was in a be er condi on.

Suresh too decided to take the Kaladhungi road but he le Delhi in the a ernoon. It was dark by the me 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 direc ons. He ended up being in an unknown place that was scarcely inhabited.



- Let's see what type of risks Rohit and Suresh took.
- Discuss 'Risk Appe te and Resilience' with the par cipants as given in the Par cipant Handbook.

Say 🤷

· Let's learn more about risk appe te and resilience with the help of an ac vity.

# - Team Ac vity 🕍

Risk Appe te

- Thisisagroup ac vity.
- In the previous unit, you read success stories of Mr Dhirubhai Ambani and Dr Karsanbhai Patel.
- Mr Ambani le 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 Appe te Statement of both the companies.

Ac vity De-brief

- Who took a greater risk?
- What are the di erences between the Risk Appe te Statement of both the companies?

### - Do 🗹

- Instruct the par cipants that this is group work.
- Divide the class into small groups of 4.
- Give each group a chart paper.
- Tell the par cipants that they have to evaluate the risks taken by Mr Dhirubhai Ambani and Dr Karsanbhai Patel.
- Give the par cipants 15 minutes to discuss and write.
- Keep a check on me. Tell the group to wind up quickly if they go beyond the given me limit.

Ask 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 U ar Pradesh. He started his first job at an MNC. He quit a er 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

me, 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 a er which, the company enabled online payment transac ons. The company got licenses from RBI in 2016 to launch India's first ever payment bank. Moreover, the main mo ve of Paytm was to transform India into a cashless economy.

A er demone za on came into e ect, Vijay Shekhar Sharma started promo ng online and digital transac ons 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 quali es made Vijay Shekhar Sharma a resilient entrepreneur.
- Discuss Entrepreneurship and Resilience with the par cipants as given in the Par cipant Handbook.

- Say 🖻

Let's learn more about entrepreneurship and resilience with the help of an ac vity.

### - Team Ac vity 🟙

Entrepreneurship and Resilience

- Thisisagroupac vity.
- Think of some entrepreneurship ventures that faced challenging mes, but later resulted in success stories.
- Who is the founder of that company?
- What challenging mes did it face?
- How did it overcome those challenges?
- List the resilient characteris cs of the entrepreneur.

Ac vity De-brief

- Each group to give their presenta on.
- Why did you choose this company?
- What is the success story of the company?

### Do 🗠

- Instruct the par cipants that this is group work.
- Divide the class into small groups of 4.
- Give each group a chart paper.
- Tell the par cipants that they have to think of an entrepreneur who faced challenging mes, but eventually succeeded.
- Give the par cipants 15 minutes to discuss and write.
- Keep a check on me. Tell the group to wind up quickly if they go beyond the given me limit.

## Summarize 🔎

- You can summarize the key points of the unit.
- Ask the par cipants what they learned from the ac vi es.
- Clarify any ques ons or doubts they might have.

#### UNIT 9.5.8: Success and Failures

## - Unit Objec ves 🦉

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

• Discuss how to deal with failure

## - Resources to be Used

• Par cipant Handbook

Ask 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'shave 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 s II a substan al 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 par cipants as given in the Par cipant Handbook.

Ask ask

- Have you felt or experienced fear?
- What led you to feel that emo on?
- How did you handle it?

Sav 🗣

· Let's learn the about success and failure with the help of an ac vity.

## Team Ac vity 🕍

- 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 dura on of the ac vity.
- 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 darifica ons if needed. Give the par cipants about 5 minutes to discuss and decide their roles.
- Ask the groups to stop the discussion as soon as the me is over.
- Invite each group one by one to come and present their interview as a role play.

### - Notes for Facilita on 🖃

#### Facilita ng Role Plays

Preparing for the ac vity

- 1. Carefully review the details of the scenario and the character descrip ons.
- 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 situa ons depicted in the role plays.
- 4. An cipate poten all ques ons that might be raised by the part cipants and be ready to address them.

Conduc ngtheac vity

- 1. Introduce the ac vity. Emphasize that role playing provides par cipants with an opportunity to apply their new knowledge, skills, and tools in situa ons that simulate actual interac ons with customers.
- 2 Ask par cipants to form pairs. Direct the members of each group to choose who will play the roles. Remind the groups that each par cipant should be given the opportunity to play/prac ce the di erent roles.

- 3. Conduct a demonstra on so that par cipants become familiar with the expecta ons related to the roles and support materials.
- 4. To maintain spontaneity of the interac ons during the role play, ask the par cipants 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 ques ons that may arise and provide guidance as needed.
- 7. A er 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 question on given in the de-briefing for each role play. Encourage part dipants to provide constructive criticism during their discussions.
- 9. Conclude the ac vity by asking par cipants to think about whether and how they might use scripted role plays in their real life.



• Wrap the unit up after summarizing the key points and answering ques ons.



### UNIT 9.6: Preparing to be an Entrepreneur

### Key Learning Outcomes 💈

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

- 1. Discuss how market research is carried out
- 2 Describe the 4Ps of marke ng
- 3. Discuss the importance of idea genera on
- 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 se ng goals
- 10. Di eren ate 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 formali es for applying for bank finance
- 15. Discuss how to manage their own enterprise
- 16. List the important ques ons that every entrepreneur should ask before star ng an enterprise

UNIT 9.6.1: Market Study/ The 4Ps of Marke ng/ Importance of an IDEA: Understanding Market Research
<ul> <li>Unit Objec ves </li> <li>At the end of this unit, par cipants will be able to:</li> <li>Discuss how market research is carried out</li> <li>Describe the 4 Ps of marke ng</li> <li>Discuss the importance of idea genera on</li> </ul>
<ul> <li>Resources to be Used</li> <li>Par cipant Handbook</li> <li>Chart papers</li> <li>Markers pens</li> <li>Blank sheets of paper</li> </ul>
<ul> <li>Ask </li> <li>Suppose, you want to open a restaurant, what are the factors you will consider?</li> <li>How will you promote your restaurant?</li> </ul>
<ul> <li>Example</li> <li>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 or market research before star ng the project. Based on the informa on he gathered, he made his business plan. His hostel is now flourishing and he is thinking of expanding to other tourist des na ons.</li> </ul>
<ul> <li>Say </li> <li>Discuss "Market Study" with the par cipants. Refer to the Par cipant Handbook.</li> <li>Let's learn about market study and research with the help of an ac vity.</li> </ul>
Team Ac vity       Image: Second

What type of research will you do?

Ac vity De-brief

- Ask each group to come forward and give a brief presenta on.
- Encourage other groups to be interac ve and ask ques ons.
- What factors did you keep in mind while doing your research?
- Based on our research would you go ahead and open a tui on centre?

Do Say Say Set 100 Se

• By opening a tui on centre you are o ering a service.

What factors will you keep in mind before opening it?

- Say 🖻

Sav

Ask ask

• Discuss "The 4Psof Marke ng" with the par cipants as given in the Par cipant Handbook.

• Let's learn about the 4Ps of Marke ng with the help of an ac vity.

## - Team Ac vity 🕍

5

4 Ps of Marke ng

- This is a group ac vity.
- You have to sell a pen to four di erent segments:
  - 1. Rural villagers
  - 2 Rural middle class
  - 3. Urban middle dass
  - 4. Upper end rich people (Niche market)

Keeping the 4Ps of Marke ng in mind, what marke ng strategy will you design to sell the pen?

Ac vity De-brief

- Ask each group to present their strategy.
- Encourage other groups to be interac ve and ask ques ons.

## Do 🗠

- Instruct the par cipants 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 par cipants that they have to design a marke ng strategy keeping the 4Ps of Marke ng in mind.
- Give the par cipants 20 minutes to discuss and come up with their strategy.
- Keep a check on me. Tell the group to wind up quickly if they go beyond the given me limit

Ac vity De-brief

- Ask each group to come forward and give a brief presenta on.
- Ask each group what they kept in mind while designing their marke ng strategy.
- Encourage other groups to be interac ve and ask ques ons.

## Say 🤷

- Each entrepreneur has an idea of wants he wants to sell. It may be a service or a product.
- Discuss "Importance of an IDEA" as given in the Par cipant Handbook.

## - Summarize 🔎

- Summarize the key points of the unit.
- Ask the par cipants what they learnt from the ac vi es.
- Encourage them to ask if they have any doubts.

Facilitator Guide UNIT 9.6.2: Business En ty Concepts Unit Objec ves 🖉 At the end of this unit, par cipants will be able to: • Recall basic business terminology Resources to be Used Par cipant Handbook Sav Let's recall some basic business terminology. Discuss the Business En ty Concepts as given in the Par cipant Handbook. Let's learn some basic business terminology by having an activity. We will have a quiz today. Ac vity • The ac vity is a quiz. Do Divide the dass 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 ques on is passed to the next group. Explain the purpose and dura on of the ac vity. Ask the ques ons of the quiz. Keep a score of the groups. Set guidelines pertaining to discipline and expected tasks. Summarize 2 Summarize the unit by discussing the key points. Notes for Facilita on QUESTIONS FOR THE QUIZ 1. What does B2B mean? Business to business

2	What is a financial report?
	A comprehensive account of a business' transac ons and expenses
3.	Who is a sales prospect?
	A poten al customer
4.	How is working capital calculated?
	Current assets minus current liabili es
5.	What is an es ma on of the overall worth of a business called?
	Valua on
6.	You are buying a house. What type of transac on is it?
	Complex transac on
7.	How will you calculate the net income?
	Revenue minus expenses
8.	How is Return on Investment expressed?
	Aspercentage
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 transac ons?
	Simple, Complex and Ongoing Transac ons
14.	The degrading value of an asset over me is known as
	Deprecia on
15.	What are the two main types of capital?
	Debt and Equity

Facilitator Guide

#### UNIT 9.6.3: CRM & Networking

## Unit Objec ves 🦉

At the end of this unit, par cipants 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

• Par cipant Handbook

- Ask ask

- Can your business run without customers/buyers?
- Who is the most important en ty in any business?

#### Say 🤷

- The key to every success business lies on understanding the customer's expecta ons and providing excellent customer service.
- Discuss about CRM and its benefits. Refer to the Par cipant Handbook.
- Providing excellent customer service entails:
  - o Trea ng your customers with respect.
  - o Be available as per their need/schedule.
  - o Handling complaints e ec vely.
  - o Building long las ng rela onships.
  - o Collec ng regular feedback.
- Handle customer complaints proac vely. Ask "what happened", "why it happened", "how can it be avoided next me", etc.
- Collec ng feedback from the customers regularly will enable you to improve your good/service.
- "Let's understand it be er with the help of some case scenarios. You will be give n some cases within your groups. You have to analyse the case scenario that has been given to you and then find an appropriate solu on to the problem."

Do

- Divide the class into four groups of maximum six par cipants 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 solu on to the given problem.
- Put down the discussion points (de-brief ques ons) on the board. Give the class 5-10 minutes to discuss the case and note down their solu ons.
- At the end of 10 minutes, the team should present their case solu on to the class.

# - Team Ac vity 🕍

#### 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 bo om. 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 sa sfy the customer. What should Raju do to retain his customer?

#### Scenario 2

Rajni runs a bou que 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 bou que have unique designs. Smita has to a end her cousin's wedding; she goes to Rajni's bou que 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 a er this incident? What would you do if you were in Rajni's place?

#### Scenario 3

Shama is a beau cian who o ers 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 remunera on 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. A er 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 i n 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 proac vely takes part in all the transac ons 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 men on of the free services. She immediately demands to see the Shailender. When Shailender's head asks howmuch 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, crea ng 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 solu on with the dass.
- The group will first briefly describe the case to the dass.
- Then discuss the issue iden fied and the proposed solu on.
- Present the solu on as a role play.
- Post presenta on, the other groups may ask ques ons from the group that has presented.

### - Do 🗹

Sa

- Congratulate each group for the presenta on/role play.
- Ask the audience to applaud for them.
- Keep a check on me. Tell the group to wind up the discussion quickly if they go beyond the given me limit.

 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 Par cipant Handbook.

#### Group Discussion

Ac vity

• Conduct a group discussion in the class on how they can do networking for their business.

# - Summarize 🗵

- Ask the par cipants what they have learnt from this exercise/ ac vity.
- Ask if they have any ques ons 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 9.6.4: Business Plan: Why Set Goals?

# Unit Objec ves 🧭

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

- Discuss the importance of se ng goals
- Di eren ate 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 🦉
Par cipant Handbook
Chart papers
Blank papers
Marker pens
Ruler

# Ask 🔍

- Remember we had wri en 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 me bound goals?
- What me limit did you set for your goal 3 weeks, 3 years, 10 years?

_ Say 🖻
<ul> <li>Talk about short term, long term and medium-term goals, as discussed in the Par cipant Handbook.</li> </ul>
Ask 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 par cipants to share their business ideas.
A.sk (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 Par cipant Handbook. Let's understand it be er with the help of an ac vity. Team Ac vity 🕍 Wring a business Plan • This is a group ac vity. Give the groups the required resources such as chart paper and markers. This ac vity 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 ac vity the group will develop a business plan for the business idea. The business plan prepared will be presented by the groups to the class. MY BUSINESS PLAN Execu ve Summary: What is your Mission Statement? Business Descrip on: What is the nature of your business? Market Analysis: What is your target market? Organiza on and Management: What is your company's organiza onal structure? Service or Product Line: What is the lifecycle of your product/service? Marke ng and Sales: How will you adver se 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 ac vity.
- Use the blank papers for the second part of this ac vity
- Make your business plan on a chart paper based on the following parameters:
  - 1. Execu ve Summary
  - 2. Business Descrip on
  - 3. Market Analysis
  - 4. Organiza on and Management
  - 5. Service or Product Line
  - 6. Marke ng and Sales
- Explain each parameter in detail as done in the Par cipant 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 6

- Now, let's share our plan with the class.
- Each group will briefly describe the plan to the class.
- Post presenta on, the other groups may ask ques ons 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 me. Tell group to wind up the discussion quickly if they go beyond the given me 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 'Pisk Management' in detail as given in the Par, cipant.

Discuss 'Financial Planning' and 'Risk Management' in detail as given in the Par cipant Handbook.

#### - Summarize 🏼

- · Ask the par cipants what they have learnt from this exercise/ ac vity.
- Ask if they have any ques ons related to what they have talked about so far.

## Notes for Facilita on Keep the business plan format ready in a flipchart to display it during the ac vity.

#### UNIT 9.6.5: Procedures and Formali es for Bank Finance

#### Unit Objec ves 🦉

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

- Discuss the importance of se ng goals
- Di eren ate 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

- Par cipant 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 5

- While most entrepreneurs think 'product' is the most di cult 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 op ons available in India are:
    - o Bootstrapping: Also called self-financing is the easiest way of financing
    - Crowd funding: Funds are collected by consumers pre-ordering or dona ng for star ng the business.
    - Angel investors: Individual or group of investors investigation of the company
    - Venture capitalists: Venture capitals are professionally managed funds who invest in companies that have huge poten al. They usually invest in a business against equity.
    - o Bank loans: The most popular method in India.
    - o Microfinance Providersor NBFCs
    - o 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 le er of introduc on, business brochure, references of other banks, and financial statements.
- Explain the details to be filled in a loan applica on form.
- Divide the class into groups. Give each group a loan applica on 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 par cipants if they have any ques ons related to what they have talked about so far.

#### - Notes for Facilita on 🗐

- Checklist of documents is provided as resources for the session.
- You can make some copies and distribute it during the group ac vity.
- Download sample loan applica on forms from any na onalised bank's website. Print su cient 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. Opera onal details in Annexure I

6. CMA data for the last three years, es mates for current year and projec on for the next year

7. Term Ioan/DPG requirements in Annexure II

8. List of machinery in respect of machinery offered as security in Annexure III

9. Addi onal 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 cer ficate from banks and financial ins tu ons cer fying the latest liability with
- 14. Copy of board resolu on authorizing the company to apply to your bank for the credit facili es men oned in applica on

- 15. Copy of memorandum and ar de of associa on (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.



#### - Team Ac vity 🙀

Enterprise Management

- This is a group ac vity.
- Design a matrix lis ng the topics and key words that are needed to run an enterprise e ec vely and smoothly.

Ac vity De-brief

- Have each group present their matrix.
- Encourage par cipants of the other groups to ask ques on about each other's presenta on.

- Do 🗠

- Instruct the par cipants that this is group work.
- Divide the class into small groups of 4.
- Give each group a chart paper and coloured pen.
- Tell the par cipants that they have make a matrix they need to fill.
- They have to write the main topics and key words that will them e ec vely manage their enterprise.
- Give the par cipants 15 minutes to discuss and write.
- Keep a check on me. Tell the group to wind up quickly if they go beyond the given me limit.

#### - Summarize 🖉

- Ask the par cipants what they have learned from this exercise/ac vity.
- Ask if they have any ques ons related to what they have talked about so far.
- Close the discussion by summarizing the importance of e ec ve management to run an enterprise as given in the Par cipant Handbook.

Facilitator Guide



- Keep a check on me and don't let the discussion get sabotaged or lose track of me. Ensure all the questions are covered and discussed.
- Give the par cipants 15 minutes to discuss and write.
- Keep a check on me. Tell the group to wind up quickly if they go beyond the given me limit.

#### Summarize 🔎

- Ask the par cipants what they have learned from this exercise/ac vity.
- Ask if they have any ques ons related to what they have talked about so far.









Transforming the skill landscape



### 10. Annexures

Annexure 1 – Training Delivery Plan Annexure 2 – Assessment Criteria





#### Annexure I

#### Training Delivery Plan

Training Delivery Plan			
Program Name:	Cer fica	te Course in Wireman Cor	ntrol Panel
Qualifica on Pack Name & Ref. ID	Wiremar	Control Panel (ELE/Q730	)2)
Version No.	V1.0	Version Update Date	14-03-2015
Minimum Educa onal Qualifica on	10th star	ndard passed	
Maximum Educa onal Qualifica on	ITI/Diplo	ma (Electronics/Electrical	)
Training Outcomes	By the er	nd of this program, the pa	r cipants will be able to:
	<ol> <li>Wire</li> <li>Report</li> <li>Report</li> <li>Inter</li> <li>Folic</li> <li>Achin</li> <li>Mair</li> </ol>	erstand work requiremen e the control panel ort to supervisor ract with supervisor or col ow safety measures and st eve produc vity, quality a ntain good health and pos plete the documenta on	lleague andards ind safety standards

Nome         Name         Tode/Ads         Tode/Ads           1         Basicsof         Connoc o ercuits         - Understand concepts of dircuits         Follitator- Voltage, Power Factor & POX. PD1, Voltage, Power Factor & POX. PD1, PD12, PD13, PD14, PD15, PD14,
of Shielded &

	Mining	AutoCAD	•	Unshielded Cables, Cable Gauges & AWG sizes IS standards for Colour Codes & Applica on Understand Electrical Circuits (Series / Parallel) Understand Daisy Chain & Point to Point Networking Using Star & Delta Connec ons, Bus Bars, Line chokes & Capacitors, ISA Symbols		Facilitatas	Videoc	
2	Wiring Drawings of Control Panels	AutoCAD drawings	•	Read AutoCAD drawings of Wiring Understand basic AutoCAD Commands	ELE/N7302 PC3, PC9, PC13, PC17, PC19, PC20, KB15, SA2	Facilitator- led – Discussion Demonstra on	Videos, PPT's, Laptop, Projector, Projector Screen, White Board	6hrs
3	Electrical Safety	Safety Standards	•	Use of Rubber soled Shoes, Gloves and Goggles	ELE/7302 PC20, PC32, KB2, KB7, KB13, KB20	Facilitator- led – Discussion	Videos, PPT's, Laptop, Projector,	7 hrs

			Understand Conduc vity of Water, MCBs, ELCBs, Fuses, SFUs, Earthing Pit, Earthing		Demonstra on	Projector Screen, White Board	
4	Tools & Equipment	Use of tools and equipmen t	<ul> <li>Plates &amp; Strips</li> <li>Understand the use of Mul - meter for Current, voltage (AC/DC), Resistance &amp; Con nuity measurements</li> <li>Understand the use of tester, Tong-Tester, Pliers and Wire Stripper, Screw Driver Set (All terminal types)</li> <li>Understand the use of Allen Key Set, Power Drill (Drill bits)</li> <li>Understand the use of Insula on Tape, Wire Lugs, soldering Iron</li> <li>Understand the use of Megger, Wrenches, Hammer, Wire bender and a Ladder</li> </ul>	ELE/N7302 PC5, PC6, PC8, PC9, PC10, PC11, PC12, PC16, PC17, PC31, PC423, KB1, KB2, KB6, SA1, SA2, SB6, SB7, SB11	Facilitator- led – Discussion Demonstra on		5 hrs
5	Wiring a Control Panel	Steps of wiring a control panel	<ul> <li>Determine BOQ of Components</li> <li>Check received material for specifica ons as per drawing.</li> <li>Create Channel layout</li> <li>Select the correct Conductor</li> <li>Test for Shorts / Con nuity</li> <li>Cut required lengths</li> <li>Use Ferrules &amp; Cable lugs,</li> </ul>	ELE/N7302 PC5, PC6, PC8, PC9, PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, KB5, KB6, KB7, KB9, KB10, KB11, SB2	Facilitator- led – Discussion Demonstra on	Videos, PPT's, Laptop, Projector, Projector Screen, White Board	5 hrs

			Terminal Tightening Torque Check the circuits Dress the Cables Use Cable Glands (Single Compression /Double Compression)				
6	Iden fying Faulty Components	Test and iden ficat ion of faults	Test Power     Supply	ELE/N7302 PC22, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32	Demonstra on	Videos, PPT's, Laptop, Projector, Projector Screen, White Board,	7 hrs
7	Fundamenta Is of Motors, Generators & Starters	Basics of motors and starters		ELE/N7302 KB11, KB12	Facilitator- led – Discussion Demonstra on	Videos, PPT's, Laptop, Projector, Projector Screen, White Board	4 hrs
8	Basics of AC Drives & So starters	Working of starters	Understand Components of an AC Drive system, Types of VFD Control Terminal, Wiring for I/Os, Components of a So starter, Types of So starter Control Terminal, Wiring for I/Os	ELE/N7302 KB11, KB12	Facilitator- led – Discussion Demonstra on	Videos, PPT's, Laptop, Projector, Projector Screen, White Board	6 hrs

9	Professional Skills	Wring and reading skills	•	Read Job sheets Prepare indents, invoices and Maintenance logs Use of MS Excel & MS Word for Record keeping Prepare As- built documenta on , Ferrule list Share and delega on of Tasks Prepare Task Reports	ELE/N7302 SA1, SA2, SA3, SA4, SA5, SA6	Facilitator- led – Discussion Demonstra on	Videos, PPT's, Laptop, Projector, Projector Screen, White Board	6 hrs
10	Co- ordina on & Communicat ion Skills	Repor ng supervisor	•	Prepara on of Service Reports Prepara on of Delivery Documenta on Prepare Minutes of Mee ng Manage Team Members Manage Time Targets & Commitments to Customers Prepare faulty parts report Understand Material Workflow (Stores to Produc on) Write e-mails Understand Principles of 5S & Kaizen	ELE/N9962 PC1, PC3, PC5, PC7, PC14, PC15, KA2, KA3, KB1, KB2, SB1, SB2	Facilitator- led – Discussion Demonstra on	Videos, PPT's, Laptop, Projector, Projector Screen, White Board	6 hrs

#### Facilitator Guide

11	Workplace Health & Safety	Health and safety norms	•	Understand Safety Policy Use of Fire & Hazardous chemicals handling Incident Repor ng Use of Fire Ex nguishers A, B, C, ABC Understand ESD Procedures for handling electronic components Use of Safety Helmets, Ear plugs, Shoes, Gloves, goggles & Safety harnesses Use of First aid for Electrical Shock & Burn vic ms Understand Fire Drills & Evacua on procedures Use of helmet & Respect for Tra c rules Understand Health Policy Understand Posture, exercise & diet	ELE/N9963 PC8, PC9, PC11, PC12, PC13, KB1, KB2, KB3, KB4	Facilitator- led – Discussion Demonstra on	Videos, PPT's, Laptop, Projector Screen, White Board	7 hrs
12	Workplace Asset Managemen t	Managem ent of assets	•	Crea ng Tool list & Storage of tools Calibra ng Measuring instruments Managing Tool Crib library	ELE/N9963 PC1, PC2, PC4, PC6, PC7, PC9, PC10, PC11, PC12, PC13, KA1, KA2, KA4, KB1, KB2, KB3, KB4, SB1, SB2	Facilitator- led – Discussion Demonstra on	Videos, PPT's, Laptop, Projector, Projector Screen, White Board	3 hrs

#### Annexure II

#### Assessment Criteria CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria fo	r "Wireman – Control Panel"
Job Role	Wireman – Control Panel
Qualifica on Pack	ELE/ Q 7302
Sector Skill Council	Electronics Sector Skills Council of India
Guidelines for Assessr	nent
Each Performance	ment for each Qualifica on Pack will be created by the Sector Skill Council. Criteria (PC) will be assigned marks propor onal to its importance in NOS. wwn propor on of marks for Theory and Skills Prac cal for each PC.
2. The assessment for the SSC.	r the theory part will be based on knowledge bank of ques ons created by
	ent agencies will create unique ques on papers for theory and skill prac cal idate at each examina on/training centre.
	unique evalua ons for skill prac cal for every student at each ng centre based on these criteria.
6. In case of success	ca on Pack, every trainee should score a minimum of 70% in every NOS. fully passing only certain number of NOS's, the trainee is eligible to take ment on the balance NOS's to pass the Qualifica on Pack.

7. In case of unsuccessful comple on, the trainee may seek reassessment on the qualifica on pack.

				Marks Alloca	
Element	Performance Criteria	Total Marks	Out Of	Theory	Skills Prac cal
		(300)			
	ELE/N7302 Wire control pa	inel			
	PC1. interact with the supervisor in order to understand the produc on schedule		4	2	2
Interac ng with	PC2 plan the day's produc on ac vi es based on the supervisor's instruc ons		4	1	3
customer prior to	PC3. use wiring drawings, job instruc ons or work manuals		4	2	2
visit	PC4. check availability of materials required for wiring		4	1	3

	DCE collect wire or coblec to correct out the			
	PC5. collect wire or cables to carry out the wiring process	3	1	2
	PC6. ensure that the panel is posioned as prescribed, following safety norms	4	2	2
Wiring the control panel	PC7. ensure that tools and equipment used in the wiring process are in safe and usable condi on	3	1	2
	PC8. install the feeder pipe in the panel	 3	1	2
	PC9. pull the feeder wires into the panel through the feeder pipe installed	4	2	2
	PC10. ensure that there is enough wire to get to the opposite end of the control panel	3	1	2
	PC11. connect the neutral wire to the neutral bus of the panel	3	1	2
	PC12 strip the wire just enough before making any connec ons	3	1	2
	PC13. follow the wiring diagram in order to install the branch circuit wires	3	1	2
	PC14. ensure that the outer sheathing is stripped in order to expose the conductor	3	1	2
	PC15. connect all the bare copper wires to the ground bus	3	1	2
	PC16. make sure that wires used for installa on are of appropriate size	3	1	2
	PC17. use the wiring diagram accurately to meet the specifica ons	4	2	2
	PC18. ensure that approved components or modules are available in good condi on	3	1	2
	PC19. bend the wires so that the wiring has a neat appearance a er comple on	3	1	2
	PC20. follow applicable local electrical codes and standards	3	1	2
	PC21. return all tools and equipment to stores at the end of each day's ac vi es	3	1	2

	PC22 highlight any errors in previous step of the assembly process iden fied		4	2	2
Repor	PC23. report defec ve or inadequate number of components in me		4	2	2
ng to superio r	PC24. report about inadequate quan ty of consumables such as connectors, screws, nuts, etc.		4	2	2
	PC25. achieve 100% work schedule as planned for the day		2	1	1
	PC26. meet 100% daily or monthly target		2	1	1
	PC27. achieve zero errors in assembling as per company policy		2	1	1
	PC28. achieve zero component damage		2	1	1
	PC29. check any repe ve defects during the assembly process		3	1	2
, quality and safety	PC30. keep work area dean and organized		3	1	2
standards	PC31. iden fy problems on the assembly line and alert in me		2	1	1
	PC32. achieve 100% compliance with health and safety guidelines and rules		2	1	1
		TOTAL	100	40	60
	ELE/N9962 Interact with co	workers		•	•
	PC1. understand work requirements, targets and incen ves		5	2	3
	PC2. learn about new product models, their features and func ons		5	2	3
	PC3. report problems iden fied in the field		5	2	3
Interac ng with	PC4. escalate customer concerns that cannot be handled on field		5	2	3
supervisor	PC5. resolve personnel issues		5	2	3
	PC6. receive feedback on work standards and customer sa sfac on		5	2	3
	PC7. communicate any poten al hazards at a par cular loca on		5	2	3

	PC8. meet given targets		F	2	2
	PC9. deliver work of expected quality despite constraints	,	5 5	2	3
	PC10. have feedback from a happy and sa sfied customer		5	2	3
	PC11. resolve inter-personnel conflicts and achieve smooth workflow	100	8	3	5
	PC12. receive spares from tool room or stores		7	2	5
	PC13. deposit faulty modules and tools to stores		7	3	4
Interac ng with colleagues	PC14. pass on customer complaints to colleagues in a respec ve 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. dearly demarcate roles of each team member		7	3	4
		TOTAL	100	40	60
		-	-		
	ELE/N9963 Follow safety sta	andards			
	ELE/N9963 Follow safety sta PC1. comply with general safety procedures followed in the company	andards	6	3	3
Followin	PC1. comply with general safety		6	3	3 3
g safety measure	<ul><li>PC1. comply with general safety procedures followed in the company</li><li>PC2. follow standard safety procedures while handling an equipment, hazardous</li></ul>	andards 100			
g safety	<ul> <li>PC1. comply with general safety procedures followed in the company</li> <li>PC2. follow standard safety procedures while handling an equipment, hazardous material or tool</li> <li>PC3. remove rings or any other metal</li> </ul>		6	3	3
g safety measure s and standard	<ul> <li>PC1. comply with general safety procedures followed in the company</li> <li>PC2. follow standard safety procedures while handling an equipment, hazardous material or tool</li> <li>PC3. remove rings or any other metal objects before working on the unit</li> <li>PC4. use of safety materials such as goggles, gloves, ear plugs, caps, ESD pins,</li> </ul>		6	3	3
g safety measure s and standard	<ul> <li>PC1. comply with general safety procedures followed in the company</li> <li>PC2. follow standard safety procedures while handling an equipment, hazardous material or tool</li> <li>PC3. remove rings or any other metal objects before working on the unit</li> <li>PC4. use of safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.</li> <li>PC5. escalate about any hazardous materials</li> </ul>		6 6 6	3 2 2	3 4 4
g safety measure s and standard	<ul> <li>PC1. comply with general safety procedures followed in the company</li> <li>PC2. follow standard safety procedures while handling an equipment, hazardous material or tool</li> <li>PC3. remove rings or any other metal objects before working on the unit</li> <li>PC4. use of safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.</li> <li>PC5. escalate about any hazardous materials or things found in the premises</li> <li>PC6. report about any breach of safety</li> </ul>		6 6 6 6	3 2 2 2 2	3 4 4 4

Ŭ .	v par cipate in fire drills or related workshops organized ny		6	3	3
PC10. ensure safety neglige	no loss for company due to nce		6	3	3
PC11. maintain appropriate posture, especially in long hours of si ng or standing posi on and in handling heavy materials PC12. par cipate in company organized health sessions such as yoga, physiotherapy or games		100	15	5	10
			10	5	5
materials with	e heavy and hazardous n care and using appropriate andling equipment such as and ladders	<u>,</u>	15	5	10
		TOTAL	100	40	60



• Explain the Alloca on of Marks. Explain that they will be assessed on Theory and Skills Prac cal.

Wireman	Control	Danol
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– Notes 🗐 -		

