



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

Facilitator Guide



Sector
Electronics

Sub-Sector
Consumer Electronics

Occupation
After Sales Service

Reference ID: ELE/Q3105, Version 1.0
NSFQ Level: 5

Field Engineer

—

RACW



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

Shri Narendra Modi
Prime Minister of India

Acknowledgements

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

I would like to take the opportunity to thank everyone who contributed in developing this Guide for the QP Field Engineer – RACW.

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

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

CEO

Electronics Sector Skills Council of India

About this Book

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

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

Symbols Used



Steps



Time



Tips



Notes



Objectives



Do



Ask



Explain



Elaborate



Field Visit



Practical



Lab



Demonstration



Exercise



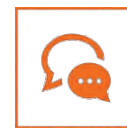
Team Activity



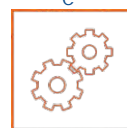
Facilitation Notes



Learning Outcomes



Say



Resources



Activity



Summary



Role Play



Example

Table of Contents

S. No	Modules and Units	Page No.
1.	Introduction (ELE/N3101, ELE/N3115, ELE/N3116, ELE/N3117)	1
	Unit 1.1 - Refrigerator and Air Conditioner	3
	Unit 1.2 - Washing Machine	6
	Unit 1.3 - Job Role of FE – RACW	8
2.	Basic Science (ELE/N3101, ELE/N3115)	11
	Unit 2.1 - Basics of Matter and Change of States	13
	Unit 2.2 - Units of Measurement and Conversion	15
	Unit 2.3 - Heat, Temperature and Types of Heat	18
	Unit 2.4 - Heat Emission, Absorption & Energy Conversion	20
3.	Basic Electronics (ELE/N3101, ELE/3112, ELE/N3113, ELE/N3114)	23
	Unit 3.1 - Basic Circuit	25
	Unit 3.2 - Insulator, Conductor, Semiconductor and Active and Passive Elements	27
	Unit 3.3 - Voltage, Current and Difference between AC and DC	29
	Unit 3.4 - Units, its Importance and Conversion	31
	Unit 3.5 - Resistor and Ohm's Law	32
	Unit 3.6 - Power Calculation	33
	Unit 3.7 - Inductors and Capacitors	34
	Unit 3.8 - Other Electronic Components	36
	Unit 3.9 - Multimeter and Clamp meter	38
4.	Motor (ELE/N3113, ELE/N3115, ELE/3117)	41
	Unit 4.1 - Types of Motor	43
5.	Tools and Equipment (ELE/3112, ELE/3113, ELE/N3114)	47
	Unit 5.1 - Different Types of Tools	49
6.	Copper Pipe Processing (ELE/3112, ELE/3113, ELE/N3114)	51
	Unit 6.1 - Tube Cutting	53
	Unit 6.2 - Deburring Process	55
	Unit 6.3 - Flaring Process	56
7.	Basic Units (ELE/N3117)	57
	Unit 7.1 - Pressure, Humidity and BTU	59
	Unit 7.2 - Ton of Refrigeration and EER	60
	Unit 7.3 - BEE and Star Rating Tables	61

8.	Refrigerant (ELE/3115)	63
	Unit 8.1 - Properties, Greenhouse Effect and Gases	65
	Unit 8.2 - Ozone Layer Depletion	67
	Unit 8.3 - CFC, HCFC, HFC, HC and Alternative Refrigerants	69
	Unit 8.4 - Environmental Characteristics and Phase out Schedule	71
9.	Refrigeration (ELE/N3117)	73
	Unit 9.1 - Uses of Refrigeration and Refrigeration Cycle	75
	Unit 9.2 - Basic Components	76
	Unit 9.3 - Properties, Comfort Zone and Heat Load	78
	Unit 9.4 - Types of ACs	80
10.	Window AC - I (ELE/N3114, ELE/N3115)	81
	Unit 10.1 - Parts and Working	83
	Unit 10.2 - Safety Precautions	85
	Unit 10.3 - Installation	87
	Unit 10.4 - Test Run	89
11.	Window AC - II (ELE/N3114, ELE/N3115)	91
	Unit 11.1 - Wiring Diagram	93
	Unit 11.2 - Test Electronic Components	95
	Unit 11.3 - Fault Finding of Window AC	96
	Unit 11.4 - To Perform PMS of Window AC	97
12.	Split AC (ELE/N3114)	99
	Unit 12.1 - Parts and Working	101
	Unit 12.2 - Safety Precautions	103
	Unit 12.3 - IDU and ODU Installation and Connecting IDU and ODU	105
	Unit 12.4 - Test Run	106
	Unit 12.5 - Wiring Diagram	107
	Unit 12.6 - Testing of Electrical Component	108
	Unit 12.7 - PMS (Dry and Wet Services)	109
13.	Inverter Technology	111
	Unit 13.1 - Advantages	113
	Unit 13.2 - Controllers	115
14.	4 Way Valve	117
	Unit 14.1 - Cooling and Heating Mode	119

15.	Refrigerator (ELE/N3112, ELE/N3113)	121
	Unit 15.1 - Need and Types (DC, FF and Pel er)	123
	Unit 15.2 - Safety Rules, Policies and Procedures	125
16.	DC Refrigerator (ELE/N3112, ELE/N3113)	127
	Unit 16.1 - Working (Cooling Cycle, Frost and Defrost Method)	129
17.	FF Refrigerator (ELE/N3112, ELE/N3113)	131
	Unit 17.1 - FF Refrigerator	133
18.	Install DC and FF Refrigerator (ELE/N3112, ELE/N3113)	135
	Unit 18.1 - Installa on of DC and FF Refrigerator	137
19.	To Repair DC and FF Refrigerator (ELE/N3112, ELE/N3113)	139
	Unit 19.1 - Repair DC and FF Refrigerator	141
20.	Sealed System (ELE/3113, ELE/N3115)	143
	Unit 20.1 - Seal System	145
21.	Washing Machine (ELE/N3116, ELE/N3117)	149
	Unit 21.1 - Basics of Hand Wash	151
	Unit 21.2 - Types of Washing Machines	152
	Unit 21.3 - To Compare Di erent Washing Machines	153
	Unit 21.4 - Installa on of WM	154
22.	Semi-Automa c Washing Machine (ELE/N3116, ELE/N3117)	155
	Unit 22.1 - Semi-Automa c Washing Machine (SAWM)	157
23.	Top Loading Washing Machine (ELE/N3116, ELE/N3117)	159
	Unit 23.1 - Top Loading Washing Machine (TLWM)	161
24.	Front Loading Washing Machine (ELE/N3116, ELE/N3117)	163
	Unit 24.1 - Front Loading Washing Machine (FLWM)	165
25.	Repair Top Loading Washing Machine (ELE/N3116, ELE/N3117)	167
	Unit 25.1 - Repair Top Loading Washing Machine	169
26.	E Waste	171
	Unit 26.1 - E Waste – Electronic Waste	173
	Unit 26.2 - Sources of E waste	174
	Unit 26.3 - Components of E- Waste Management	176
	Unit 26.4 - Do Recycle	178
	Unit 26.5 - Don't Recycle	180

27.	So Skills (ELE/N3101, ELE/N9901)	181
	Unit 27.1 - Importance of So Skills and Self Introduction	183
	Unit 27.2 - Self-Grooming	185
	Unit 27.3 - Pre-Visit Phone Call	187
	Unit 27.4 - Call Closure	188
	Unit 27.5 - Inside Customer's Premises	189
	Unit 27.6 - Quality Standards	190
	Unit 27.7 - Interview Tips and FAQs	191
	Unit 27.8 - Leadership	193
28.	Employability & Entrepreneurship Skills	195
	Unit 28.1 - Personal Strengths & Value Systems	199
	Unit 28.2 - Digital Literacy: A Recap	234
	Unit 28.3 - Money Matters	243
	Unit 28.4 - Preparing for Employment & Self-Employment	261
	Unit 28.5 - Understanding Entrepreneurship	279
	Unit 28.6 - Preparing to be an Entrepreneur	308
29.	Annexures	329
	Annexure 1 - Training Delivery Plan	330
	Annexure 2 - Assessment Criteria	337





Skill India
कौशल भारत - कुशल भारत



1. Introduction

Unit 1.1 - Refrigerator and Air Conditioner

Unit 1.2 - Washing Machine

Unit 1.3 - Job Role of FE – RACW



ELE/N3101, ELE/N3115
ELE/N3116, ELE/N3117

Key Learning Outcomes

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

- Explain the basic concepts of the working of refrigerator
- Explain the basic concepts of the working of air conditioner
- Explain the basic concepts of the working of washing machine
- Explain the job role of field engineer - RACW

UNIT 1.1: Refrigerator and Air Conditioner

Unit Objectives

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

- Explain the importance of refrigerator
- Describe the air conditioner system and its importance

Explain

- Tell the definition of refrigeration.
- Then list the various applications of refrigeration systems.
- Explain the reason behind the use of air conditioner.

Notes for Facilitation

- Introduce the basic concept behind refrigeration.
- Explain that refrigeration is the process of keeping an item below room temperature by storing it in a refrigerator. A refrigerator uses a refrigerant chemical to remove heat from items stored in it.
- Refrigeration removes the unwanted heat and discharges it into another place. The basic principle is that if a colder liquid such as a refrigerant is passed continuously around an object, then the object will lose its heat and become cooler. The following figure depicts the basic refrigeration process:

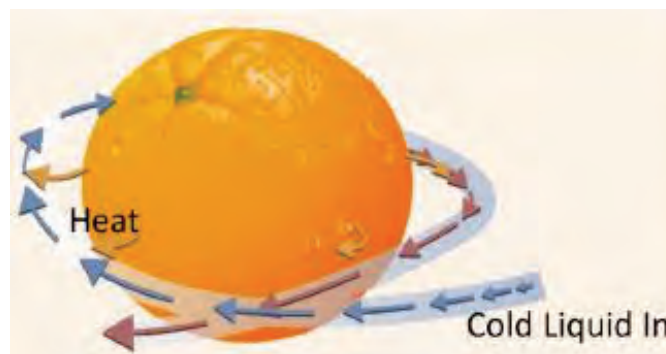


Fig 1.1.1: Refrigeration process

- Explain with the help of the given figure that the refrigeration cycle consists of the following process:
 - Evaporation: The liquid refrigerant absorbs heat from an object and evaporates as vapour.
 - Compression: The refrigerant vapour gets compressed and becomes superheated.
 - Condensation: The superheated refrigerant flows through heat exchanger and condenses to a liquid state.

- o Expansion: The high-pressure liquid refrigerant flows through the capillary tube and expands.

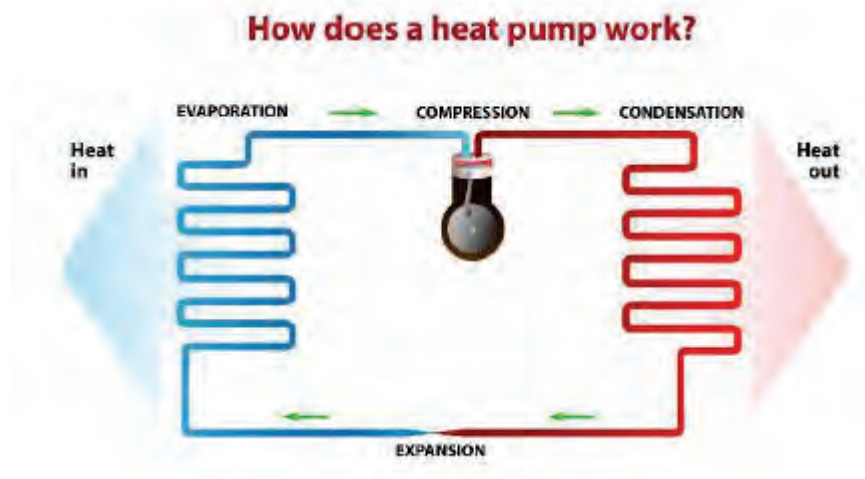


Fig 1.1.2: Working of heat pump

- Draw the following figure to explain the various applications of refrigeration.

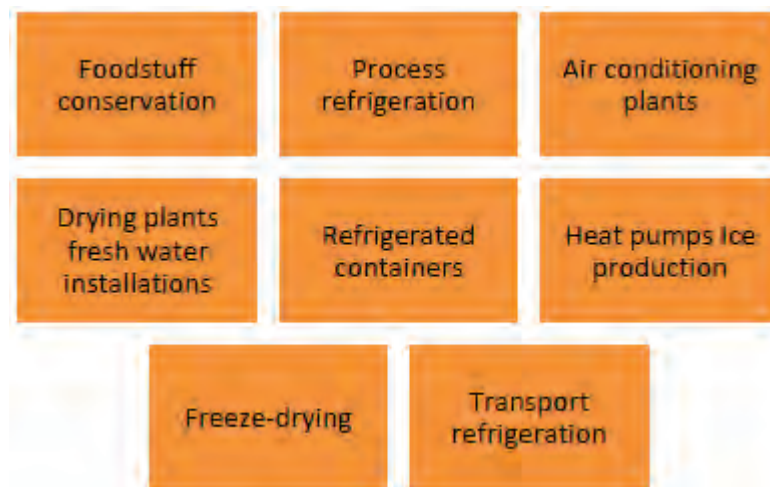


Fig 1.1.3: Application of refrigeration

- Inform them that one of the applications of refrigeration process is the use of air conditioners to make life comfortable for people.
- Give an example of people travelling in a car in summer. The outside temperature is very hot and uncomfortable, so the air conditioner in the car is switched on. This brings down the inside temperature from say 40 degrees to 24 degrees. This means that the heat inside the car space has to be thrown out. This is done by the refrigeration unit fitted in the car.
- Explain that a normal human body temperature is 36.89 degree C and the general comfort temperature zone is 22 to 26 degree C.
- Explain that to make the surroundings comfortable for people, besides temperature two more factors need to be considered.

- Draw the following figure to explain the factors that determine the condition of air.

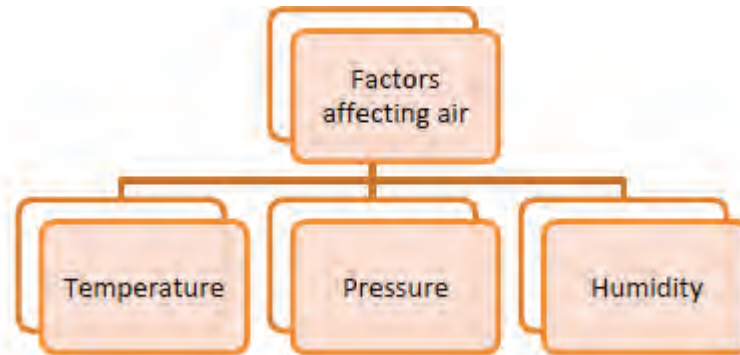


Fig 1.1.4: Factors affecting air

- Explain that if pressure is kept constant, temperature and relative humidity are inversely related to each other. Hence when temperature cools, the relative humidity rises and vice versa.
- Tell them that an air-conditioner performs the following functions:
 - Controls temperature
 - Controls humidity
 - Filters, cleans and purifies air
 - Circulates air

UNIT 1.2: Washing Machine

Unit Objectives

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

- Explain the importance of washing machine
- Describe the history of washing machine

Say

- Tell the participants that dirty clothes can be washed either by hand or in a washing machine.
- Tell that washing clothes by hand requires the person to soak, scrub and rinse the clothes manually. It is a very labour intensive task requiring a lot of hard work.
- Further add that washing machines were invented to reduce this labour and save human time and energy.
- Explain that in simple terms, the washing machine moves the clothes around in a soap solution for a while and then spins fast to remove the water from the clothes.

Notes for Facilitation

- Explain that the first washing machines were mechanical and driven by hand. Then came the steam-powered commercial washing machines followed by electric washing machines.
- Explain to them the history of washing machine with the help of the following timeline:

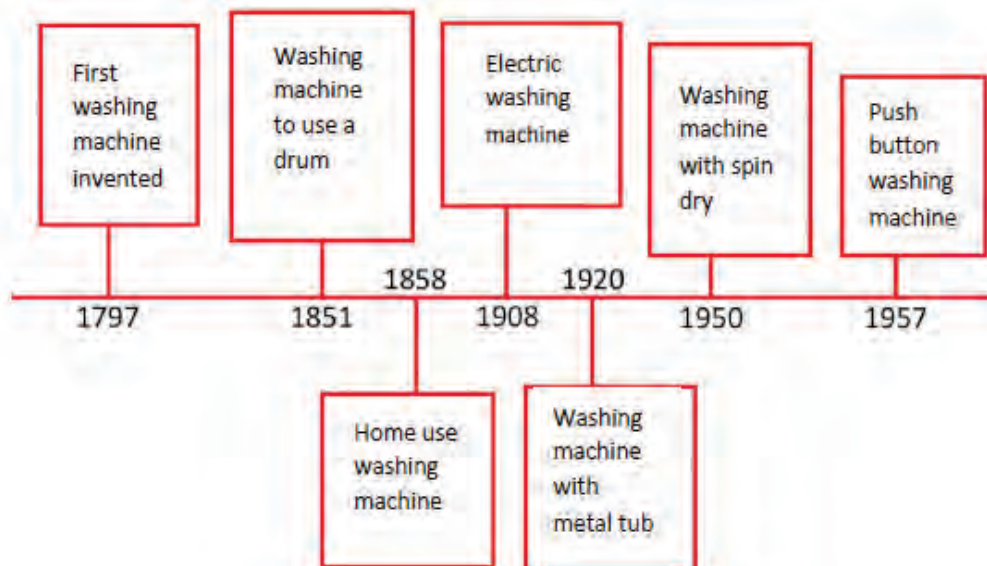


Fig 1.21: History of washing machine

- Explain that the main parts of a washing machine are:
 - Inner drum
 - Thermostat
 - Heating element
 - Motor
 - Pump
 - Valves
- Explain that all these parts are electronically controlled by a mechanism called programmer. The programmer makes the various parts go through a series of steps to wash, spin and rinse the clothes.

UNIT 1.3: Job Role of FE - RACW

Unit Objectives

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

- Explain the job role of RACW field engineer

Say

- Tell the participants about the importance of their role as a field engineer.
- Tell them about the growth in market size of refrigerators, air conditioners and washing machines.
- Tell them that in the past six years, from 2010 to 2016, the market size of refrigerators has almost doubled and that of air conditioners and washing machines has grown almost three times.

Notes for Facilitation

- Explain the job role to the participants.
- Draw the following figure and explain each task of their job role.

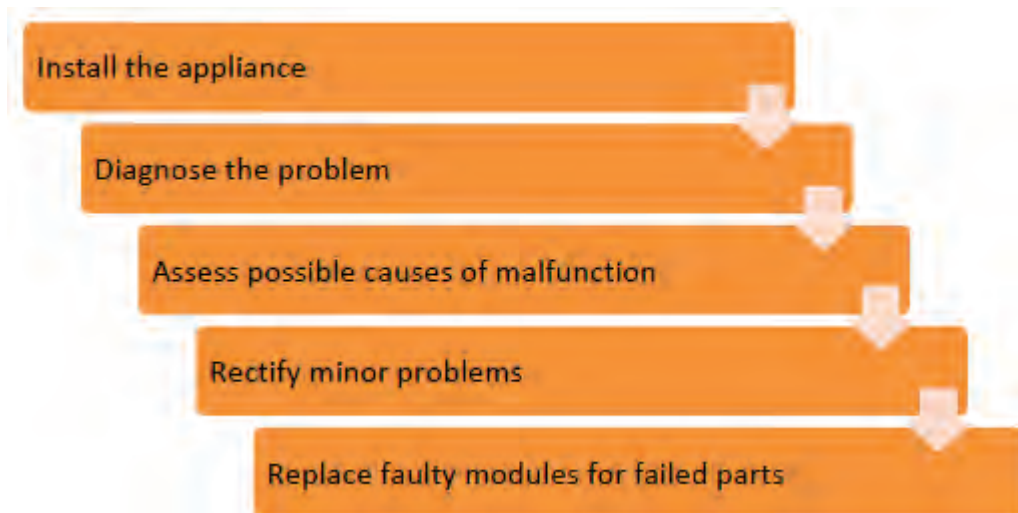


Fig 1.3.1: Task of job role

- Tell them that to be a good field engineer they should have certain personal attributes.

- Explain the attributes with the help of the following figure:



Fig 1.3.2 Personal attributes

- In addition, tell the participants that due to the exponential increase in the market size of the appliances, there is a growing need for field technicians.
- Further explain to them that depending on whether they have done ITI, diploma or degree, field engineers get a starting salary between Rs. 5,000/- to Rs. 12,000/-.
- Inform them about the career path of a field engineer.



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

2. Basic Science

Unit 2.1 - Basics of Matter and Change of States

Unit 2.2 - Units of Measurement and Conversion

Unit 2.3 - Heat, Temperature and Types of Heat

Unit 2.4 - Heat Emission, Absorption & Energy Conversion



ELE/N3101
ELE/N3115



Key Learning Outcomes

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

- List properties of matter and change of states
- Explain the importance of units
- Convert values from one unit to other
- Define properties of heat
- Explain types of heat and its measurement
- Convert temperature from one scale to another
- Explain heat emission and absorption

UNIT 2.1: Basics of Matter and Change of States

Unit Objectives

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

- List the basic states of matter
- Explain the change of states of matter

Notes for Facilitation

- Explain that matter is anything that has mass and takes up space.
- Tell the participants that, as shown in the following figure, the three states of matter are:
 - Solid: Has a fixed volume and shape
 - Liquid: Has a fixed volume but variable shape
 - Gas: Has variable volume and shape



Fig 2.1.1: Three states of matter

- Explain that matter can neither be created nor destroyed. It can only change from one state to another. These changes occur due to a change in external factors such as temperature, pressure and so on.
- In general, when the temperature is increased, solid changes to liquid and then gas and similarly when the temperature is reduced, gas changes to liquid and then solid.
- Explain that the change in the phase of matter occurs due to:
 - Melting: When a solid is heated, it changes to liquid.
 - Freezing: When a liquid is cooled to freezing point, it changes to solid.
 - Evaporation: When a liquid is heated to evaporation point, it changes to gas.
 - Condensation: When a gas is cooled to condensation point, it changes to liquid.
- Explain the change in the states of matter with the help of water as an example.

- Draw the following diagram to illustrate how water changes its state:



Fig 2.1.2. Change in state

UNIT 2.2: Units of Measurement and Conversion

Unit Objectives

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

- Explain the importance of units and conversion of units

Say

- Tell the participants that a unit of measurement is a standard value used to express or define a quantity.
- Tell them that the units of measurements provide standards for us to compare different things.
- Say that the standards are universally accepted fixed units of measurement that act as a reference for comparison.
- Tell them that conversion of units means to change the unit of measurement of a quantity through multiplication or division.

Notes for Facilitation

- Tell the participants that when we measure a quantity, it is important to express it in appropriate units for it to have meaning. Illustrate by saying that length is measured in meters, mass in grams, and volume in litres and so on.
- Give an example that if we say that the length of a road is 100, it has no meaning unless we specify the length as 100 cms or 100 kms.
- Explain that there are three main systems of units of measurement:
 - Metric system or SI system: measures in meter - kilograms-litres
 - British Imperial Units: measures in foot-pound-fluid ounce
 - US customary units: measures in inches- pounds-gallons

International System of Units - SI	
K	▶ kelvin (temperature)
m	▶ meter (distance)
A	▶ ampere (electric current)
s	▶ second (time)
mol	▶ mole (amount of substance)
kg	▶ kilogram (mass)
cd	▶ candela (intensity of light)

Fig 2.21: System of units

- Further tell them that every unit is denoted by a symbol such as k for kilo, T for tera, G for giga and so on.
- Explain to them that if we have to express a quantity in larger units, we multiply the base unit with a multiplier of 10 and to express a quantity in smaller units we divide the base unit with a multiplier of 10.
- Explain the conversion of units with the help of following figures:

Metric Unit Conversions		
<i>Length and Distance</i>		
<i>when you know:</i>	<i>multiply by:</i>	<i>to find:</i>
inches	2.5400	centimeters
feet	0.3048	meters
yards	0.9144	meters
miles	1.6093	kilometers
millimeters	0.0394	inches
centimeters	0.3937	inches
meters	3.2808	feet
meters	1.0936	yards
kilometers	0.6214	miles

Metric Unit Conversions		
<i>Weight and Mass</i>		
<i>when you know:</i>	<i>multiply by:</i>	<i>to find:</i>
ounces	28.3495	grams
pounds	0.4536	kilograms
short tons	0.9072	metric tons
kilograms	2.2046	pounds
metric tons	1.1023	short tons

Metric Unit Conversions
Volume and Capacity (Liquid)

<i>when you know:</i>	<i>multiply by:</i>	<i>to find:</i>
pints (U.S.)	0.4732	liters
quarts (U.S.)	0.9463	liters
gallons (U.S.)	3.7853	liters
liters	2.1134	pints (U.S.)
liters	1.0567	quarts (U.S.)
liters	0.2642	gallons (U.S.)

Fig 2.2.2 Conversion of units

UNIT 2.3: Heat, Temperature and Types of Heat

Unit Objectives

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

- Explain the conversion of temperature from one scale to another
- Explain properties of heat and types of heat

Do

- Make two teams.
- Ask the first team to convert 100 degree Celsius to Fahrenheit.
- Ask the second team to convert 100 degree Fahrenheit to Celsius.
- After they have done it, ask one participant from each team to write the steps of the solution on the whiteboard.

Notes for Facilitation

- Inform the participants that a thermometer is used to measure temperature.
- Tell them that a contact type thermometer is used to measure grill temperature and a non-contact type thermometer is used to measure air temperature.
- Explain that heat is not a quantity; it is the flow of energy from a hot object to a cold object. The transfer of heat between two objects occurs only when there is a temperature difference between the two objects.
- Give an example that if a hot cup filled with boiling water is kept on a table, then after some time it is observed that both the cup as well as water have cooled down. This is because the heat from the cup and the water is transferred to the surroundings.
- Similarly, if a cup of ice cold water is kept, then after some time it is observed that both of them warm up to room temperature. In this case, the heat is transferred from the surroundings which are at a higher temperature to the cup and water.
- Explain the types of heat with the help of the following diagram:

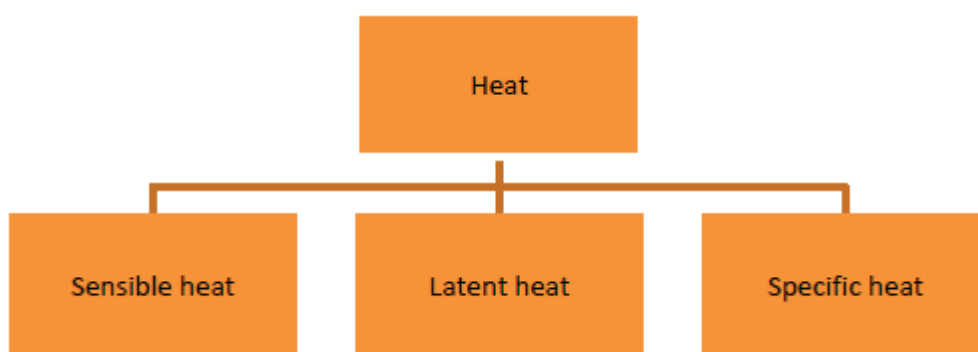


Fig 2.3.1: Types of heat

- Explain that there are three types of heat transfer:
 - Conduction: When heat transfers due to direct contact between two objects, it is called conduction. Give an example that the metal handle of a pot heats up when the pot is kept on a burner.
 - Convection: When heat transfers from one location to another due to the movement of fluid such as liquid or gas, it is called convection. Give an example of water boiling in a pan. The temperature of water remains at 100 degree Celsius and the extra heat is transferred to the surface to form vapours.
 - Radiation: When heat transfers due to the electromagnetic waves radiated by a matter, it is called radiation. It does not require any medium. Give an example of heat radiated by sun or by a light bulb.
- Explain the process of heat transfer with the help of the following figure:

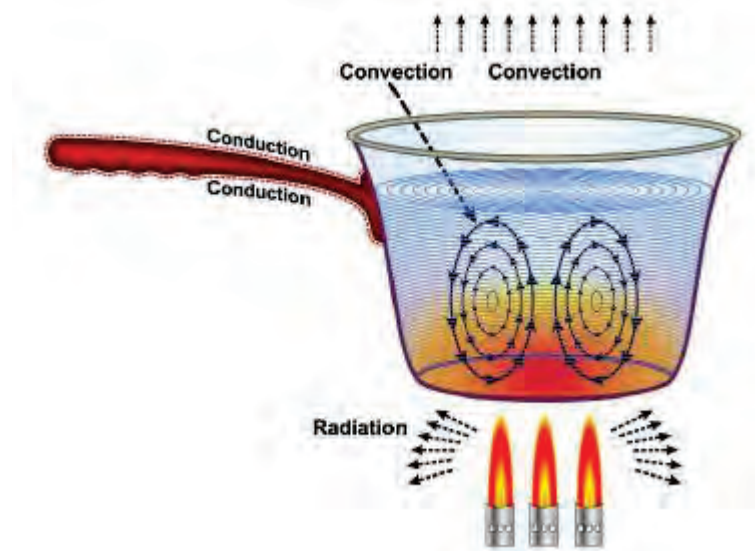


Fig 2.3.2 Heat transfer

UNIT 2.4: Heat Emission, Absorption & Energy Conversion

Unit Objectives

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

- Explain heat emission and absorption
- Explain energy conversion

Notes for Facilitation

- Tell the participants that when a surface gives out heat on being heated, it is called heat emission.
- Inform the participants that heat moves from a hotter surface to a cooler surface.
- Tell them all objects with a temperature greater than absolute zero, emit heat.
- Further explain to them the heating an object makes it emit more heat.



Fig 2.4.1: Heating of object

- Give an example that a light bulb emits heat when it is switched on.



Fig 2.4.2: Lightbulb emits heat

- Give the example of sun's rays which emit heat, and which forms the basis of using solar radiation as an alternative source of energy.



Fig 2.4.3: Source of energy

- Further, tell them that a dull, dark surface emits more heat than a shiny one.
- Inform them that heat absorption refers to the transfer of heat where the cooler object absorbs the hotter object's heat just as a sponge absorbs water.
- Tell them that the longer the object is exposed to the heat source the more heat it absorbs.
- Further tell them that in the above example of light bulb, the heat emitted by light bulb is absorbed by the surroundings.
- Also, in the example of solar radiation, it gets absorbed by the solar panel.
- Inform them that different substances have different capacity of absorbing heat.
- Explain that colour of the object affects the amount of heat absorbed by it.

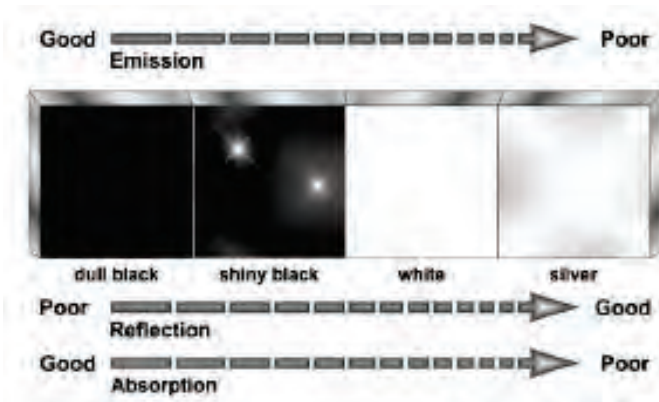


Fig 2.4.4: Amount of heat absorbed

Do

- Switch on the tube light/ light bulb.
- Ask the participants to tell which energy is getting transformed in this process.
- Switch on the electric fan.
- Ask the participants to tell which energy is getting transformed in this process.

Notes for Facilitation

- Explain that in the case of tube/bulb, electric energy is getting transformed to thermal energy and in case of electric fan, electric energy is getting transformed to mechanical energy.
- Explain that energy conversion refers to the process of changing one form of energy into other.
- Inform them that energy can neither be created nor destroyed. It simply changes from one form to another.
- Further tell them that there are many forms of energy such as electrical, thermal, nuclear, mechanical, electromagnetic, sound, and chemical.



Skill India
कौशल भारत - कुशल भारत



Skilling India in Electronics

3. Basic Electronics

Unit 3.1 - Basic Circuit

Unit 3.2 - Insulator, Conductor, Semiconductor and Active and Passive Elements

Unit 3.3 - Voltage, Current and Difference between AC and DC

Unit 3.4 - Units, its Importance and Conversion

Unit 3.5 - Resistor and Ohm's Law

Unit 3.6 - Power Calculation

Unit 3.7 - Inductors and Capacitors

Unit 3.8 - Other Electronic Components

Unit 3.9 - Multimeter and Clamp meter



ELE/N3101, ELE/N3112
ELE/N3113, ELE/N3114

Key Learning Outcomes

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

- Identify the major functionalities of any electrical/electronic circuit
- Define basic terms such as insulators, active and passive elements
- Define voltage, current and differentiate AC & DC
- Explain the importance of units and convert values from one unit to other
- Identify resistors, calculate series and parallel resistance value
- Calculate power from the given set of conditions & different appliances
- Identify other electronic components
- Identify multimeter and clamp meter

UNIT 3.1: Basic Circuit

Unit Objectives

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

- Identify basic components of a circuit
- Explain basic components of a circuit
- Explain functionalities of a circuit

Do

- Carry a bulb, a battery and an electric wire.
- Show the items and ask them to classify them as load, a supply source and conductor.

Notes for Facilitation

- Tell the participants that a circuit is a closed loop through which electricity can flow. A circuit is a path which starts and stops at the same place.
- Explain that a circuit is of two types:
 - Closed circuit: Allows uninterrupted flow of electricity from the source to the load and then back to the starting point.
 - Open circuit: Does not conduct electricity as the circuit is not complete and the flow of current gets broken.
- Explain the concept of closed and open circuits with the help of the following diagram:

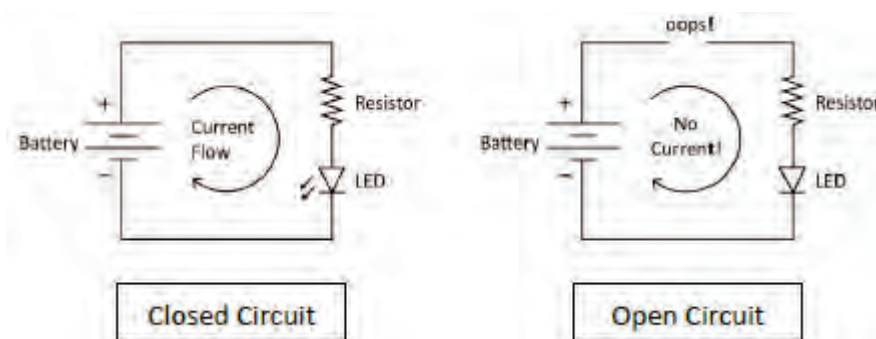


Fig 3.1.1: Closed and open circuit

- Inform them that there is another type of circuit called short circuit. It refers to a circuit which does not have a load. However, the current in a short circuit can flow at very high levels and can damage electronic components or even cause a fire.

- Draw the following diagram to explain the basic components of a circuit:

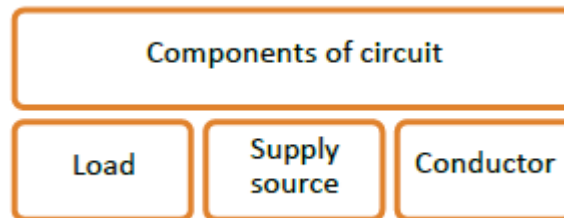


Fig 3.1.2 Basic components of circuit

- Tell the participants that:
 - A load is any device that draws power from the circuit such as a light bulb. It represents the actual work done by the circuit. In complex circuits, the load is a combination of components such as resistors, transistors, capacitors and so on.
 - Supply source such as a battery provides energy for the current to flow through the circuit.
 - Conductors such as wires provide the route to conduct electricity through the circuit.
- Further, explain that load, supply source and conductors are the general categories of components. The basic electronic components of a circuit are:






Components	Name Identifier	Image	Function
Resistors	R		Resists the flow of current
Transistors	Q		Amplifies or switches electrical power
Capacitors	C		Stores electric charge
Light Emitting Diode (LED)	D		Emits light when activated
Integrated Circuit (IC)	U		Contains the entire electronic circuit

Fig 3.1.3: Basic components of circuit

UNIT 3.2: Insulator, Conductor, Semiconductor and Active and Passive Elements

Unit Objectives

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

- Define Insulators, Conductors and Semiconductors
- Define Active Elements
- Define Passive Elements

Do

- Carry a piece of rubber, wood, plastic, copper wire, metal spoon and a tin can in bag A.
- Carry an IC, transistor, LED, resistor, diode and capacitor in bag B.

Notes for Facilitation

- Explain that an insulator is a material that restricts the flow of electricity or heat as it has a very high resistivity. It protects a circuit and its components from the dangerous effects of electricity.
- Explain that insulators are used to provide coating to electric wires and cables. They are also used to separate electrical conductors.
- Explain that a conductor is a material that allows the flow of electric current.
- Explain to them that solids can be of following three types depending on their ability to conduct electricity:

Insulators	Conductors	Semiconductors
<ul style="list-style-type: none"> • They do not allow electricity to pass through them 	<ul style="list-style-type: none"> • They have the property to pass electricity 	<ul style="list-style-type: none"> • Their conductivity lies between that of insulators and conductors. • An increase in temperature increases the conductivity of semiconductors

Fig 3.21: Types of solids

- Show them the things that you are carrying in bag A.
- Ask them to classify the things into insulators and conductors.
- Explain that the examples of insulators include wood, rubber, paper glass and so on and of conductors are silver, copper, gold, aluminum, iron and so on.

- Explain that in an electric circuit there are two types of elements
 - Active elements: These elements generate energy in the form of current or voltage. A real life example of active elements is sun, as it has its own light and energy.
 - Passive elements: These elements do not need a source of energy to perform their functions. They store or release energy.
- Show them the things that you are carrying in bag B.
- Ask them to classify the things into active and passive elements.
- Explain that the following figure represents the active elements in a circuit:



Fig 3.2.2: Active elements

- Explain that the following figure represents the passive elements in a circuit:

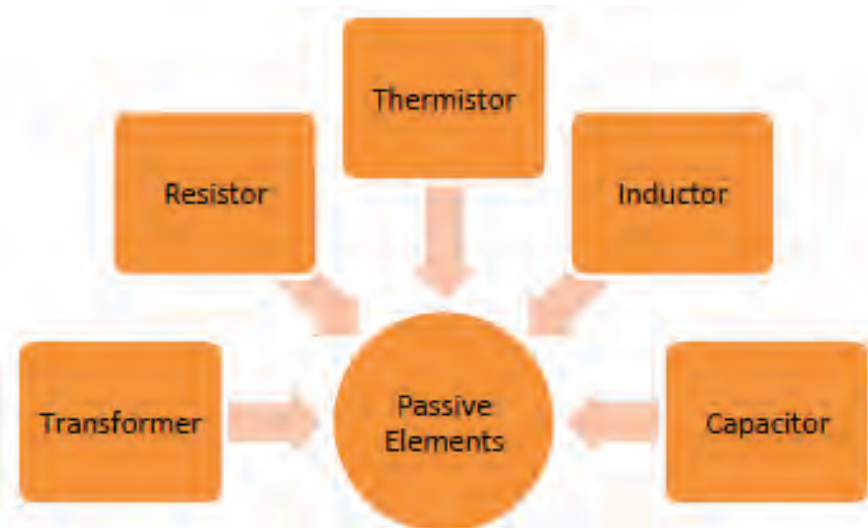


Fig 3.2.3: Passive elements

UNIT 3.3: Voltage, Current and Difference between AC and DC

Unit Objectives

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

- Define Voltage
- Define Current
- Differentiate between AC and DC

Notes for Facilitation

- Explain to them that electricity is nothing but the movement of electrons. These electrons create charge when they move. This charge generates electricity.
- Explain that:
 - Voltage is the difference between the charges at two points. It is measured in Volts and is denoted by the symbol, 'V'.
 - Current is the rate of flow of charge. It is measured in Ampere and is denoted by the symbol, 'A'.
- Explain that the amount of current that a wire can carry, depends on:
 - Type of metal used to make the wire
 - Diameter of the wire
 - Type of insulation covering the wire
- Explain that there are two types of currents:
 - AC or alternating current
 - DC or direct current
- Explain the features of AC with the help of the following figure:

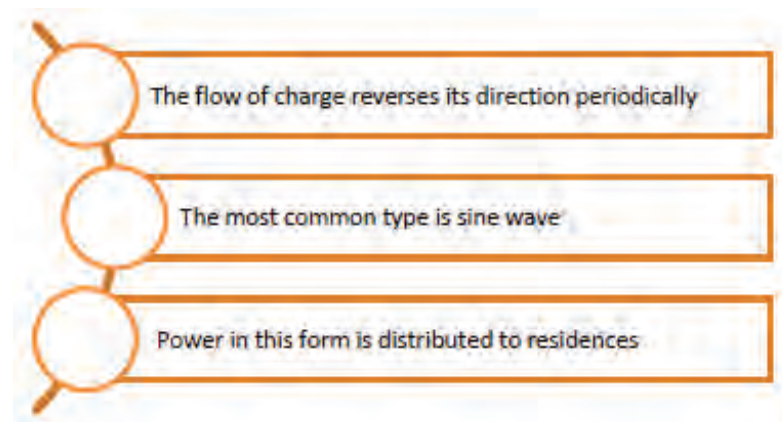


Fig 3.3.1: Features of AC

- Explain the features of DC with the help of following figure:

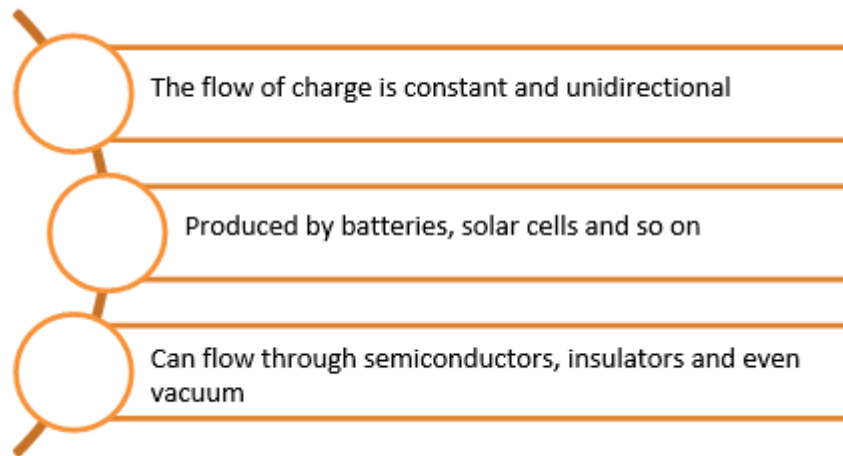


Fig 3.3.2: Features of DC

- Explain AC and DC currents with the help of following diagrams

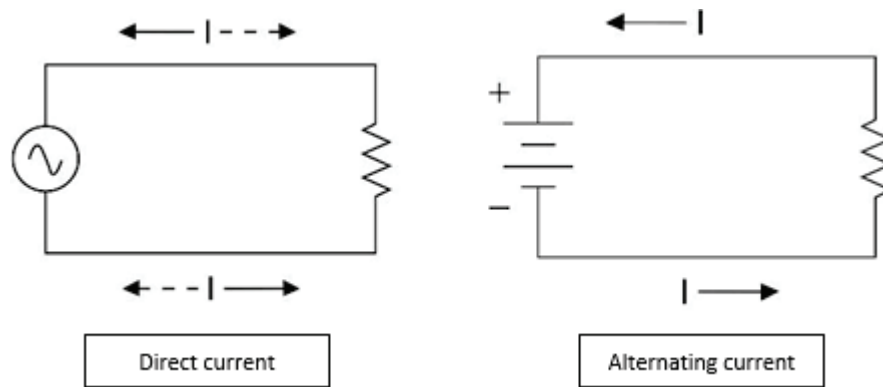


Fig 3.3.3: DC and AC current

UNIT 3.4: Units, its Importance and Conversion

Unit Objectives

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

- Define Units
- Explain Conversion of Units

Notes for Facilitation

- Refer to the notes for facilitation described in unit 2.2 for a quick recap of the concept of units and conversion of units.

UNIT 3.5: Resistor and Ohm's Law

Unit Objectives

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

- Define Resistor
- Explain and Implement Ohm's Law

Do

- Carry a resistor

Notes for Facilitation

- Explain that resistance is the opposition that a material offers to the flow of charge. A conductor has low resistance and an insulator has higher resistance.
- Tell them that a resistor is a passive electronic component of the circuit that limits the flow of charge.
- Further, tell them that Ohm's Law defines the relationship between current, voltage and resistance.
- Explain that, according to Ohm's Law, the current flowing through any circuit is directly proportional to voltage and inversely proportional to the resistance. The mathematical equation of Ohm's Law is:
 - $I = V / R$
 - where,
 - I is the current
 - V is the voltage or potential difference
 - R is the resistance of a conductor
- Tell that if there is an increase in voltage, it leads to an increase in current. Draw the following graph to explain the linear relation between voltage and current:

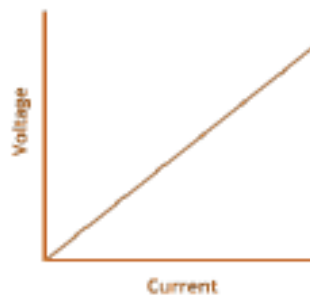


Fig 3.5.1: Linear relation between voltage and current

UNIT 3.6: Power Calculation

Unit Objectives

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

- Define Power
- Calculate Power

Ask

- Start the session by asking them if they know what power is in terms of electric circuit.

Explain

- Explain the meaning of power in terms of electric circuit.
- Explain the calculation of power consumption

Notes for Facilitation

- Explain to them that power is the rate at which electrical energy is consumed in a circuit.
- Explain that power depends on voltage and current and is measured in watts.
- Tell them that electric power can also be defined as the work done by an electric current in a unit time.
- Explain that the power consumed within a structure is measured with the help of electricity meters provided by the power company such as the one shown in the following figure:



Fig 3.6.1: Electricity meter

- Explain that the consumers are charged for electricity by the amount they use.
- Explain that the unit of measurement of power consumed is watt-hour, that is the consumer pays for:

$$\text{Watt-hour} = \text{Total watts consumed} \times \text{time in hours}$$

UNIT 3.7: Inductors and Capacitors

Unit Objectives

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

- Explain Inductors
- Explain Capacitors

Do

- Carry an inductor, a capacitor and a multimeter.

Demonstrate

- The way to check a capacitor using a multimeter.

Notes for Facilitation

- Explain to them an inductor is a passive electrical component made up of a coil of wire around a central core.
- Explain that when current is passed through an inductor, it stores energy in the form of magnetic field.
- Inform them that Inductors are denoted by series of looped coils, as shown in the following figure:



Fig 3.7.1: Inductors

- Tell them that the inductance of an inductor depends on:
 - Radius of coil
 - Number of turns of coil
 - Material of the core
- Inform them that inductors are used in filters, sensors, transformers, motors and so on.
- Explain that a capacitor is a passive electronic component that stores electrical energy as a static electric field.
- Tell them that a capacitor is made up of two parallel metal plates separated by an insulator known as dielectric.

- Inform them that capacitors are denoted by two plates with two terminals going perpendicularly into them, as shown in the following figure:



Fig 3.7.2 Capacitor

- Inform them that in addition to being a storing device, capacitors are also used as timing devices, tuning devices, smoothing devices and signal decoupling and coupling devices.

UNIT 3.8: Other Electronic Components

Unit Objectives

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

- Explain transformer
- Explain photo transistor
- Explain thermistor
- Explain IC

Do

- Carry a small transformer, photo transistor, thermistor and an internal circuit (IC).

Notes for Facilitation

- Explain that a transformer is a static device that transforms electrical power from one circuit to another. It works on the principle of mutual induction of two coils.
- Explain that it is used to change the voltage of power supplied to consumers.
- Inform them that the symbol of a transformer contains two coils kept against each other, with a pair of lines between them, as shown in the following figure:

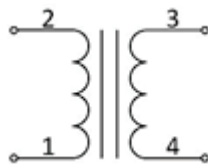


Fig 3.8.1: Symbol of transformer

- Explain that there are two types of transformers:
 - Step-up Transformer: used to raise the output voltage. Examples of its usage include x-ray machines and microwaves. These require a small step-up transformer to operate.
 - Step-down Transformer: used to reduce the output voltage. Examples of its usage include various domestic equipment.
- Explain the working principle behind the use of transformers in power distribution to consumers.
- Explain that phototransistor is a device that converts light energy to electric energy.
- Tell them that it is a bipolar device and is made of a semiconductor material such as silicon.
- Explain that as they are dependent on light, the phototransistors are enclosed in clear or opaque containers with an exposed base that amplifies the light that it comes in contact with.

- Phototransistors are used in electronic devices that sense light such as CD players, smoke detectors and so on.
- Explain that a thermistor is a type of temperature sensitive semiconductor. Its resistance is dependent on the temperature. Thermistors are used in electronic devices as temperature sensors.
- Inform them that the symbol of a thermistor is shown in the following figure:



Fig 3.8.2 Symbol of thermistor

- Explain that there are two types of thermistors:
 - Negative Temperature Coefficient or NTC: The resistance decreases as the temperature increases.
 - Positive Temperature Coefficient or PTC: The resistance increases as the temperature increases.
- Explain that an IC is a small electronic device made of a semiconductor material such as silicon. It is also known as chip, microchip and silicon chip. It is a thin, wafer like chip on which thousands of tiny resistors, capacitors and transistors are fabricated.
- Inform them that the IC is represented by a rectangle, with pins connected to the sides. Each pin must be labelled with a number and its function, as shown in the following figure:

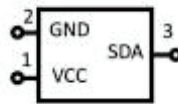


Fig 3.8.3 Symbol of IC

- Explain that there are two types of ICs:
 - Linear ICs
 - Digital ICs

UNIT 3.9: Multimeter and Clamp meter

Unit Objectives

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

- Explain multimeter
- Measure values of components using multimeter
- Explain clamp meter

Do

- Carry an analog multimeter, digital multimeter, a clamp meter, AA battery, resistor and an electrical conductor.

Demonstrate

- The way to measure voltage of an AA battery using a multimeter.
- The way to measure resistance of a resistor using a multimeter.
- The way to measure the continuity using a multimeter.
- The way to measure current of an electrical conductor using a clamp meter.

Notes for Facilitation

- Explain that a multimeter is a multi-function device used to measure voltage, current, resistance and continuity of circuit.
- Explain that multimeter is of two types:
 - Analog multimeter: It uses a microammeter with a moving pointer to display readings.
 - Digital multimeter: It displays numeric output on digital screen.
- Explain that a multimeter has three parts:
 - Display: To view the readings
 - Selection knob: To select various functions such as current, voltage and resistance
 - Ports: To insert the leads
- Explain that the leads are flexible, insulated wires that plug into the multimeter. The red wire is for positive and the blue wire is for negative port.
- Probes are insulated metal needles that can be touched to wires, components and so on.
- Explain the parts of leads:
 - Probes
 - Plug
 - Tip

- Explain that a clamp meter is a multimeter with clamps to measure current. It is used to measure alternating current only.
- Explain that the clamp is placed around a live wire without interrupting the operation of the electrical appliance.
- Explain the parts of clamp meter:
 - Clamps
 - Trigger: used to open the clamps
 - Dial
 - Display
 - Jacks
- Explain the dos and don'ts of using a multimeter to check AC voltage, with the help of the following figure:

1. • Ensure that the meter's selection switch is set for AC voltage at its highest scale
2. • Ensure that the meter is placed in parallel with load circuit
3. • Ensure that the meter's selection switch is placed at off position after being used
4. • Ensure that the battery is not damaged or worn out
5. • Never exceed the input rating of the meter
6. • To avoid electric shock, never touch the metal tips
7. • Never touch any equipment while measuring voltage
8. • Always wear shoes or stand on insulated surface
9. • Disconnect leads from voltage points before charging the battery
10. • Connect the multimeter in series when measuring current and in parallel when measuring voltage

Fig 3.9.1: Dos and don'ts of using multimeter



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

4. Motor

Unit 4.1 - Types of Motor



ELE/N3113, ELE/N3115
ELE/N3117

Key Learning Outcomes

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

- Explain the working of different types of motors used in RACW products

UNIT 4.1: Types of Motor

Unit Objectives

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

- Explain different motors used in RACW products

Ask

- Start the session by asking the participants if they know what an electrical motor is.
- Ask them if they can tell the types of electrical motors used in RACW.

Explain

- Explain the meaning of an electric motor.
- Explain about capacitor start motor.
- Explain about relay start motor.

Notes for Facilitation

- Tell the participants that an electric motor is a device that converts electricity into motion. In simple words, motor is a device that transforms electrical energy into mechanical energy to produce rotational force.



Fig 4.1.1: Motor

- It works on the principle of electromagnetism, that is, when magnetic field and current interact with each other, they produce a force in the perpendicular direction.

- Inform them that the symbol of motor contains an encircled M as shown in the following figure:



Fig 4.1.2 Symbol of motor

- Explain that a motor has following essential parts:
 - Stator of the motor: A permanent magnet around the edge of the motor case that remains static
 - Rotor of the motor: Coil mounted on an axle that spins around at high speed
 - Air gap: The distance between rotor and stator
 - Windings: Wires laid in coils wrapped around a magnetic core
 - Commutator: Slip ring segments insulated from each other and the motor's shaft
- Explain to them that electric motor can be classified as follows:

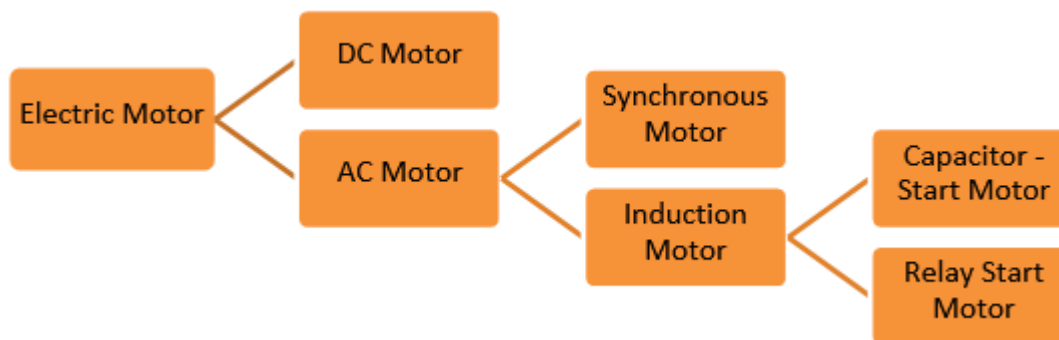


Fig 4.1.3: Electric motor

- Further explain that DC motor runs on direct current sources such as batteries, motor vehicles and AC motor runs on alternating current sources such as inverters and generators and from power grid.
- The synchronous motor runs at a synchronous speed and the induction motor runs at a speed less than synchronous speed.
- In addition, tell them that in capacitor start motor, a capacitor is used to improve the starting performance of the induction motor. The capacitor rapidly brings the motor up to a predetermined speed and is then disconnected via a centrifugal switch. The result is that more starting torque is available for heavy loads such as air conditioner compressors, large fans, pumps and high inertia loads.
- Further explain to them that relays are switches that control an electrical circuit by opening and closing contacts in another circuit.
- Explain them that a relay is used with a capacitor-start motor to increase the starting torque and their main function is to assist in starting the motor.

- Inform them that the symbol of relay consists of a coil with a switch as shown in the following figure:

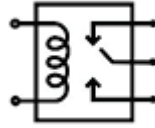


Fig 4.1.4: Symbol of relay

- Tell them that relays are of three types
 - Current relay: Uses the high inrush of current, drawn by a motor when it starts, to energise the coil of the relay.
 - Potential relay: Uses the induced voltage, created by a motor when it starts, to energise the coil of the relay.
 - Positive temperature coefficient relay: Uses a positive temperature coefficient thermistor to remove the starting components from the circuit.



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

5. Tools and Equipment

Unit 5.1 - Different Types of Tools



ELE/N3112, ELE/N3113
ELE/N3114

Key Learning Outcomes

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

- Trainee will be able to identify different tool and explain their use

UNIT 5.1: Different Types of Tools

Unit Objectives

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

- Identify the tools & equipment used in RACW

Do

- Carry some tools to show to the participants.

Notes for Facilitation

- Explain that the RACW technicians work with a variety of hand tools and equipment.
- Explain that the technician should always use the right tools for the right job. This helps in improving the quality of repairs and servicing.
- Further, explain that use of improper tools such as using a flat screwdriver in place of a cross screwdriver can result in safety hazards.
- Explain the use of various tools and equipment with the help of the following table:

Name	Function
Screw driver	Used to turn or remove screws
Cutting knife	Used to cut various objects such as wires, cords and tapes
Measuring tape	Used for measuring
Spirit level gauge	Used to indicate whether a surface is horizontal (level) or vertical
Key hole saw	Used to cut holes
Hack saw	Used to cut metal
Drilling machine and bits	Used to drill holes
Tube cutter	Used for cutting tubes
Flaring tools	Used to flare tube
Deburring tool/Reamer	Used for rounding out rough edges
Torque wrench	Used to apply a specific torque to a fastener
Swaging tools	Used to make a permanent brazed connection

Name	Function
Vacuum pump	Used to remove gas from a sealed volume to leave a partial vacuum
Manifold gauge set	Used to measure air conditioner units pressure
Electronic charging scale	Used to show the progress of the charge as it's happening while weighing refrigerant
Refrigerant leak detector	Used to test and handle refrigerant leak
Tube bender	Used to bend tubes and pipes
Brazing torch	Used to apply heat using a gas flame on the joint being brazed
Brazing alloy	Used as filler metals for brazing
Insulation tape roll	Used to insulate electrical wires
Digital clamp meter	Used to measure very high currents
Spanners/Wrenches	Used to provide grip to apply torque for turning objects such as a nut or a bolt
Combination pliers	Used to hold objects firmly
Allen key	Used to drive bolts and screws
Wire stripper	Used to strip the electrical insulation from electric wires
Copper tube	Used to supply hot and cold water
Coupler	Used to connect two shafts together
Digital multimeter	Used to measure voltage, resistance, and current
Crimping tool	Used to join wires with metal or plastic objects
Socket set	Used to tighten or loosen a fastener such as a nut or bolt by turning it
Infrared sensing device	Used to measure infrared (IR) light radiating from objects
Pulley puller	Used to install or remove various mechanical pulleys

Fig 5.1.1: Tools and equipments



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

6. Copper Pipe Processing

Unit 6.1 - Tube Cutting

Unit 6.2 - Deburring Process

Unit 6.3 - Flaring Process



ELE/N3112, ELE/N3113
ELE/N3114

Key Learning Outcomes

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

- Perform tube cutting using tube cutter
- Perform tube bending using tube bender tools
- Perform tube deburring using tube deburring tools
- Perform tube flaring

UNIT 6.1: Tube Cutting

Unit Objectives

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

- Perform tube cutting
- Perform tube bending

Resources to be Used

- Tube cutter, tube bender and copper pipe.

Demonstrate

- The way to cut a tube with the help of a tube cutter.
- The way to bend a tube with the help of a tube bender.

Notes for Facilitation

- Introduce the topic of copper pipe processing by telling that copper is one of the softest metals to bend and so most of the tubes used in RAC are made of copper.
- Explain that copper tubing operations in RAC include:



Fig 6.1.1: Copper tubing operations in RAC

- Explain that a tube cutter is a tool used to cut tubes and pipes. It is an important tool required for installation and servicing.
- Tell them that it produces a clean cut and is faster and more convenient than a hacksaw.
- Inform them that there are two types of tube cutters:
 - Plastic tube cutter: to cut thin pipes and tubes
 - Tube cutter with sharp teeth and adjustable grip: for thicker pipes
- Explain that a tube can be bent in many different angles and directions. The most common bends are elbows and U-bends. The elbow bends range from angle of 2 to 90 degree and the U-bend is a 180 degree bend.
- Explain the dos and don'ts of the tube cutting and bending process with the help of the following figure:

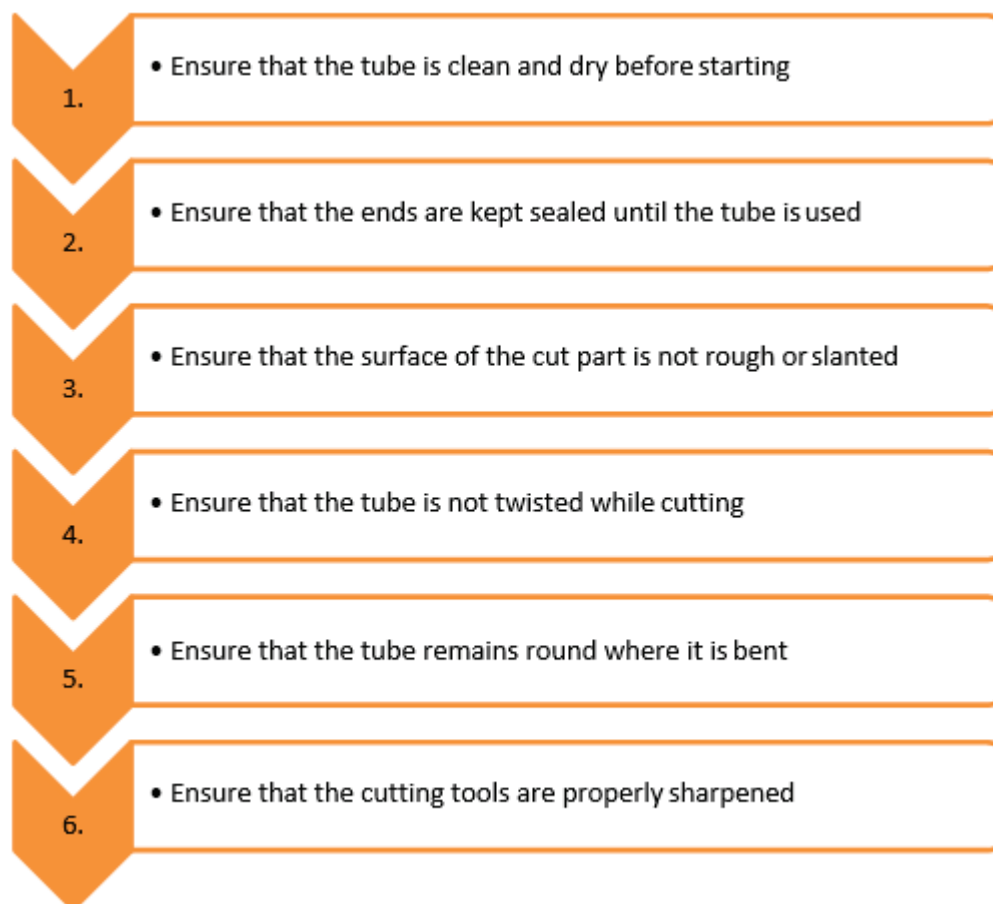


Fig 6.1.2: Dos and don'ts of tube cutting and bending process

UNIT 6.2: Deburring Process

Unit Objectives

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

- Perform tube deburring using tube deburring tools

Resources to be Used

- Tube cutter and a pipe.

Demonstrate

- The way to deburr a tube with the help of a tube deburrer.

Notes for Facilitation

- Explain that a tube deburrer is a tool used to remove burrs from a tube after it is cut.
- Tell them that burrs are like shavings that appear on the inside of a tube at the cut point.
- Inform them that these burrs can compromise the seal and integrity of the tubes and so must be removed.
- Explain the dos and don'ts of the tube deburring process with the help of the following figure:

Always pay attention when operating this tool as it contains sharp blade which can lead to personal injury.

Ensure that the end of the tube is pointed downwards to allow the burrs to fall out and away from the tube.

Ensure that the burrs are cleared before continuing with the process.

Fig 6.21: Dos and don'ts of tube deburring process

UNIT 6.3: Flaring Process

Unit Objectives

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

- Perform tube flaring

Resources to be Used

- Tube flarer and a pipe.

Demonstrate

- The way to flare a tube with the help of a tube flarer.

Notes for Facilitation

- Explain that a tube flarer is a tool used to flare tubes and pipes to enable them to connect to each other.
- Explain that the end of the copper tube is flared at 45degree angle.
- Tell them that a flared joint has many benefits:
 - Can make a connection without using a flame
 - Can open and close the connection repeatedly without any leakage
 - Used in refrigeration connections, oil supply lines, natural gas connections and so on
- Explain the dos and don'ts of the tube flaring process with the help of the following figure:

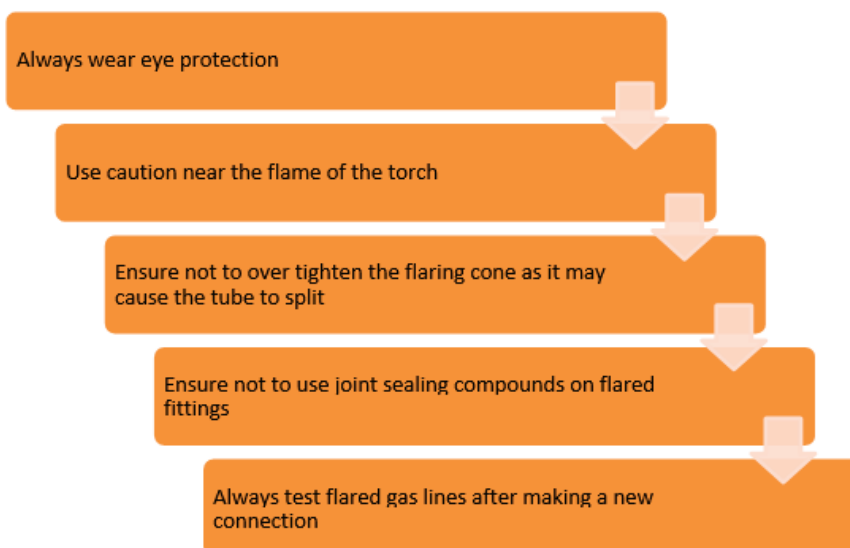


Fig 6.3.1: Dos and don'ts of tube flaring process



Skill India
कौशल भारत - कुशल भारत



Skilling India in Electronics

7. Basic Units

Unit 7.1 - Pressure, Humidity and BTU

Unit 7.2 - Ton of Refrigeration and EER

Unit 7.3 - BEE and Star Rating Tables



ELE/N3117

Key Learning Outcomes

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

- Define the terms, Pressure, Humidity & BTU
- Define the terms, Ton of Refrigeration & EER
- Compare different star ratings and read BEE star rating of AC and refrigerator

UNIT 7.1: Pressure, Humidity and BTU

Unit Objectives

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

- Explain about pressure, humidity and BTU

Do

- Carry two drawing pins, one wooden block and a hammer.

Demonstrate

- Press the first drawing pin into the wooden box with the hammer.
- Now, try to press the second drawing pin from the flatter side into the wooden box with the hammer.

Notes for Facilitation

- Explain that pressure is the amount of force exerted per area and can be calculated as:
 - $\text{Pressure} = \text{force} / \text{area}$
- After the end of the demonstration, explain that it was not possible to press the pin into the wooden box from the flatter side. The pressure at the flat end was less as the area was wider even though same force was exerted in both the case.
- Explain that humidity is the amount of water vapour present in the air. It is measured as:
 - Absolute humidity: the actual amount of water vapour in air
 - Relative humidity: the amount of water vapour in air relative to what air can hold.
- Explain that the full form of the term 'BTU' is British thermal unit and is a traditional unit of heat.
- Tell them that it is defined as the amount of heat required to increase the temperature of one pound of pure water by one degree Fahrenheit.
- Inform them that BTU is used to calculate the efficiency ratings of heating and cooling systems such as air conditioners, refrigerators and ovens.

UNIT 7.2: Ton of Refrigeration and EER

Unit Objectives

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

- Explain about Ton of Refrigeration and EER

Notes for Facilitation

- Explain that Ton of Refrigeration (TR) is a unit of refrigeration capacity. It denotes the amount of heat required to melt one ton of ice in 24 hours.
- Explain that the full form of the term 'EER' is Energy Efficiency Ratio. In simple terms, it denotes how well an AC cools compared to how much energy it needs. The higher the EER, the higher is the efficiency of the unit.
- Explain that higher efficiency will lead to:

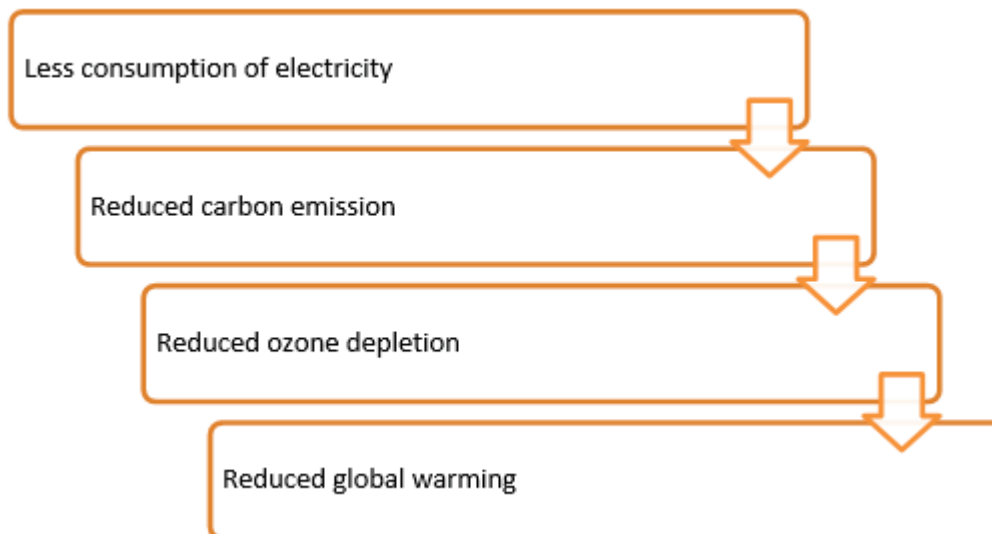


Fig 7.21: Advantages of higher efficiency

- Explain that EER is determined by a set outside and inside air temperature and a 50% relative humidity.
- EER enables comparison of efficiency of similar products.

UNIT 7.3: BEE and Star Rating Tables

Unit Objectives

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

- Compare different star ratings and read BEE star rating of AC and refrigerator

Do

- Carry an image of BEE Star label.

Demonstrate

- Show the BEE star label to the participants
- Explain the details mentioned on the label.

Notes for Facilitation

- Explain that the full form of the term 'BEE' is Bureau of Energy Efficiency. It is a government of India agency. It develops programs to increase the conservation and efficient use of energy.
- The BEE standard the energy labelling requirements for the appliances.
- Explain that it is mandatory for all appliances such as refrigerators, air conditioners and televisions to have BEE ratings. The BEE Star labels show how much electricity the appliance will consume.
- Explain that more stars mean more electricity saving.
- Explain BEE star energy labelling scheme with the help of following figure:

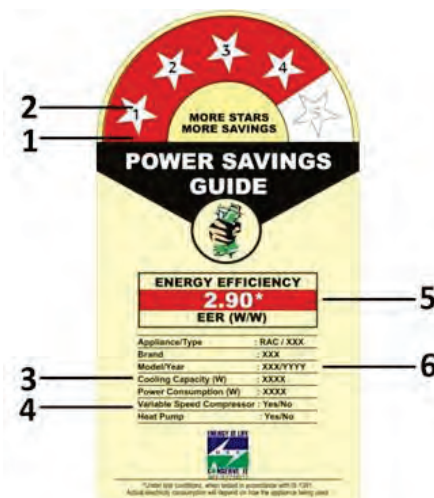


Fig 7.3.1: BEE star labelling scheme

- Explain the BEE star label to the participants
 - "1" The red shade indicates the Energy Star Rating
 - "2" 1 star rating is the lowest and 5 star rating is the highest
 - "3" Indicates the cooling capacity
 - "4" Informs about the technology variant
 - "5" Indicates the energy efficiency rating
 - "6" Make and model details

Key Learning Outcomes



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

- Define refrigerant
- List properties of refrigerants
- Explain greenhouse effect
- Explain about ozone layer depletion
- List different properties of CFC, HCFC & HFC like R12, R134A, R32
- Explain properties of HC such as R290, R600A
- Explain importance of alternative refrigerants such as R410A with properties
- Explain the GWP and ODP of different refrigerants
- Explain the phase out schedule of refrigerants

UNIT 8.1: Properties, Greenhouse Effect and Gases

Unit Objectives

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

- Define refrigerant
- List properties of refrigerants
- Explain greenhouse effect

Notes for Facilitation

- Explain to the participants that a refrigerant is a chemical used in cooling systems such as refrigerators and air conditioners. It acts as a heat carrier and changes from gas to liquid and back to gas in the refrigeration cycle.
- Explain that it is contained within the copper coils of air conditioners.
- Explain the working of a refrigerant with the help of the following figure:

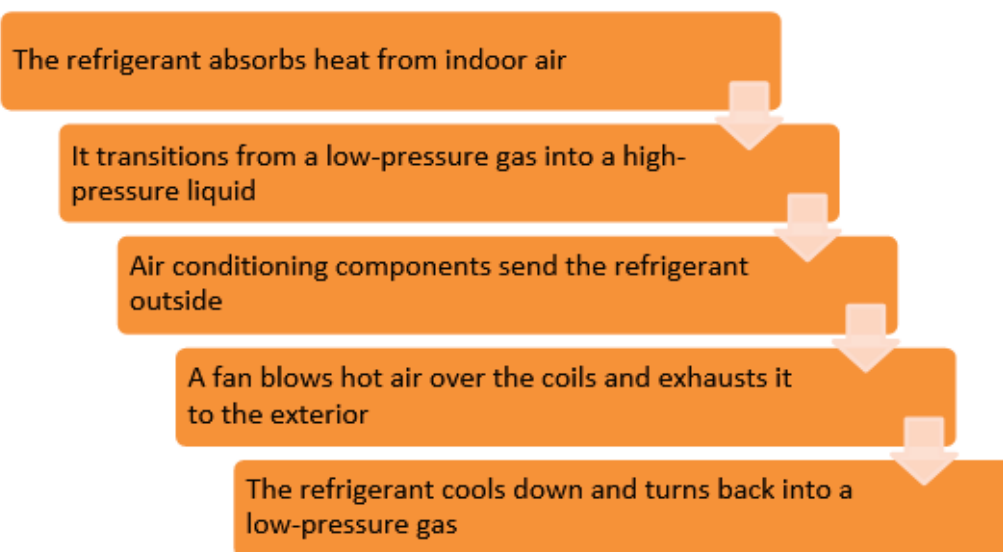


Fig 8.1.1: Working of refrigerant

- Explain the properties of a refrigerant.
- Explain that the greenhouse gasses are a group of gasses that absorb infrared radiation.
- Explain that they trap and hold heat in the atmosphere making the earth's surface warmer.

- This increase in heat is called the greenhouse effect which creates global warming as shown in the following figure:

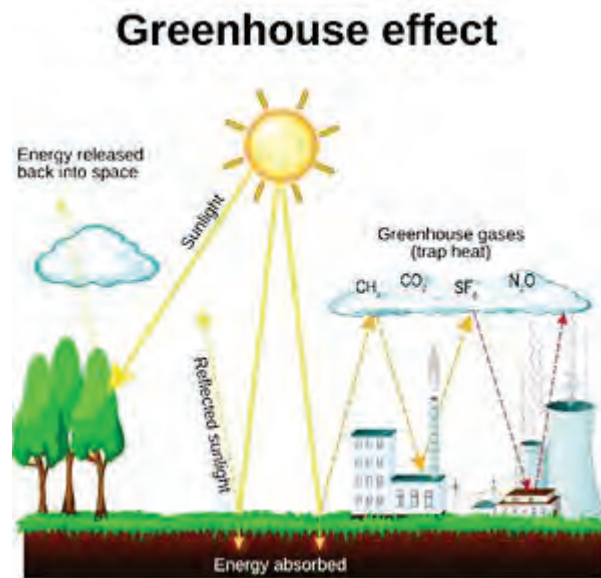


Fig 8.1.2 Greenhouse effect

- Inform that the most important greenhouse gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and the halocarbons (CFCs, HCFCs and HFCs).
- The main source of greenhouse gases are:
 - Use of fossil fuel
 - Deforestation
 - Livestock farming
 - Industrialisation
 - Use of synthetic fertilizers
- Explain that the greenhouse effect causes potentially catastrophic consequences such as depicted in the following figure:

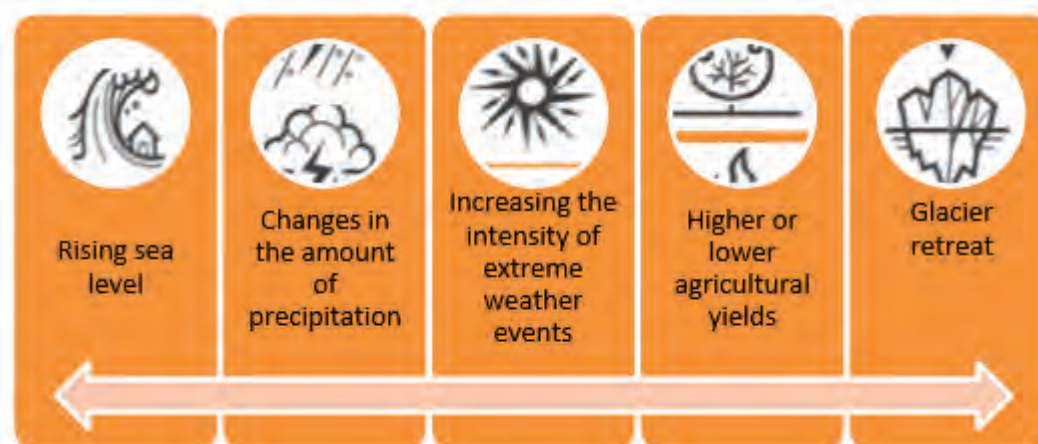


Fig 8.1.3: Causes of greenhouse effect

UNIT 8.2: Ozone Layer Depletion

Unit Objectives

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

- Explain about depletion of ozone layer

Notes for Facilitation

- Explain that ozone:
 - is a naturally occurring gas in the atmosphere
 - is an unstable molecule of triatomic form of oxygen (O₃)
 - is blue in colour and has a strong odour
 - absorbs the harmful ultraviolet (UV) rays of the sun
 - protects living organisms
- Explain that the earth's atmosphere is composed of different layers and the ozone layer is found in the lower region of stratosphere.
- Explain that ozone is a naturally occurring oxygen molecule containing three atoms. It protects earth by absorbing the harmful UV rays of the sun.
- Explain that ozone depletion refers to the thinning of ozone layer in the stratosphere.
- Tell them that the ozone layer depletion and climate change are the two most important environmental concerns.
- Explain that the main cause of ozone depletion is excessive release of ozone depleting substances such as chlorofluorocarbons (CFCs), Hydrofluorocarbons (HFCs) and halons.
- Tell that the chlorine and bromine elements in the refrigerants are responsible for ozone depletion.
- Explain the ozone depletion process with the help of the following figure:

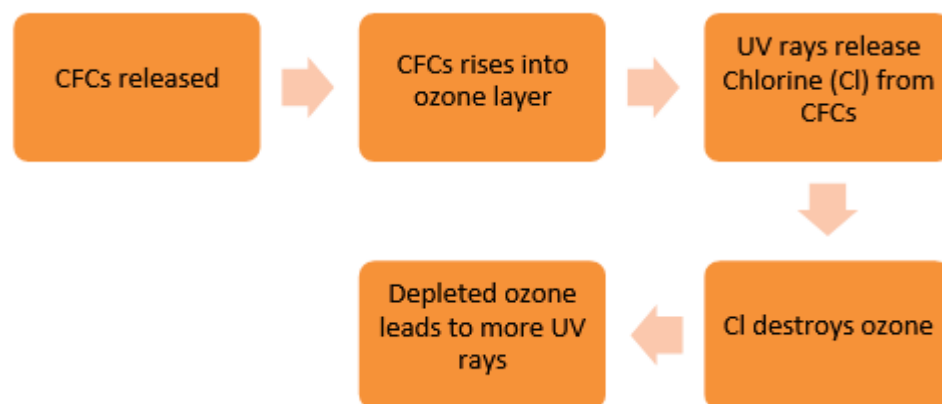


Fig 8.2.1: Process of ozone depletion

- Explain that after discovering the harmful effects of CFCs, an international treaty called the Montreal Protocol was signed in 1987 to reduce the manufacture of these chemicals.

- Explain with the help of the following figure that the depletion of ozone layer will lead to:



Fig 8.2.2 Effect of ozone depletion layer

UNIT 8.3: CFC, HCFC, HFC, HC and Alternative Refrigerants

Unit Objectives

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

- Explain about properties of different refrigerants

Notes for Facilitation

- Explain that the refrigerants can be divided into two main groups:
 - Synthetic refrigerants: CFCs, HCFCs and HFCs
 - Non-synthetic refrigerants: natural refrigerants such as hydrocarbons, carbon dioxide, ammonia, water, air
- Explain that the synthetic refrigerants such as CFCs and HCFCs were invented as substitutes for the higher toxicity and flammable refrigerants.
- Explain that based on their impact on ozone layer, the synthetic refrigerants are of two types:
 - Refrigerants with ozone depletion potential: CFCs, HCFCs and HFCs
 - Refrigerants without ozone depletion potential: Perfluorocarbons, Unsaturated HFCs and Hydrofluoroethers
- Explain that:
 - CFCs consist of chlorine, fluorine, and carbon. The most common refrigerants in this group are R11, R12 and R115 (within the blend R502).
 - Hydrochlorofluorocarbons (HCFCs) consist of hydrogen, chlorine, fluorine, and carbon. The most common refrigerants in this group are R22, R123 and R124 (within various blends).
 - HFCs consist of hydrogen, fluorine, and carbon. The most common refrigerants in this group are R134a, R32, R125 and R143a (mostly within blends, such as R404A, R407C and R410A).
- Further explain that:
 - Perfluorocarbons (PFCs) represent another group of fluorocarbons which contains five different fluids. One of these (R218) is used in refrigerant blends. PFCs are very stable, but have very high global warming potential (GWP).
 - Unsaturated HFCs are also known as olefins. Some of them such as R1234yf and R1234ze are sufficiently stable to be used as refrigerants, and have low toxicity, low flammability and low GWP.
 - Hydrofluoroethers are a group of fluorinated chemicals which are fairly stable and are lower pressure fluids.
- In addition explain that various hydrocarbons, ammonia (NH₃) and carbon dioxide (CO₂) belong to a group named natural refrigerants. All natural refrigerants exist in nature. They have zero ozone depletion potential (ODP) and zero or negligible GWP.

- Inform them that natural refrigerants have minimal environmental impact and are more appropriate from a sustainable technological development perspective. So, natural refrigerants are being considered as alternative refrigerants in refrigeration systems.
- Tell that alternative refrigerants consist of:
 - Ammonia (NH₃, R717): NH₃ contains nitrogen and hydrogen, and is widely used as a refrigerant in industrial refrigeration, cold storage and food process cooling, commercial refrigeration and chillers.
 - Hydrocarbons (HCs): Hydrocarbons contain hydrogen and carbon, and are widely used for refrigeration purposes in domestic refrigeration, commercial refrigeration, air conditioners and chillers.
 - Carbon dioxide (CO₂, R744): CO₂ contains carbon and oxygen, and is widely used in industrial refrigeration, cold storage, commercial refrigeration and hot-water heat pumps, amongst others.
- Further tell them about the rationale behind refrigerant numbering.
- Explain that the refrigerants have very long and complex chemical names. In order to create a simple way to designate refrigerants, a method of identifying them by number was developed.
- Inform them that the number consists of a prefix made up of letter R (for refrigerant) and a suffix made up of digits such as R22, R717 and so on.

UNIT 8.4: Environmental Characteristics and Phase out Schedule

Unit Objectives

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

- Explain about environmental characteristics and phase out schedule

Notes for Facilitation

- Introduce the topic by explaining that the refrigerants are one of the major causes of the two most important issues affecting our environment:
 - Ozone depletion
 - Global warming
- Explain that chlorine and bromine contained in refrigerants such as CFCs and HCFCs are responsible for the depletion of ozone in the stratosphere.
- Explain that these compounds are therefore known as Ozone Depleting Substances (ODS).
- Tell them that the ODS are classified based on the degree of harm they cause to ozone, using a parameter called ODP.
- Tell that ODP is calculated based on the following factors:

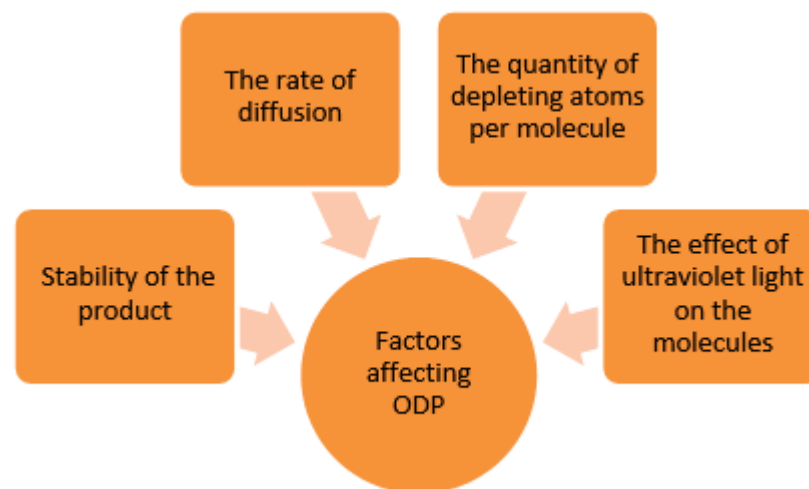


Fig 8.4.1: Factors affecting ODP

- In addition, tell them that refrigerants absorb the infrared radiation causing a warming of the atmosphere as shown in the following figure:

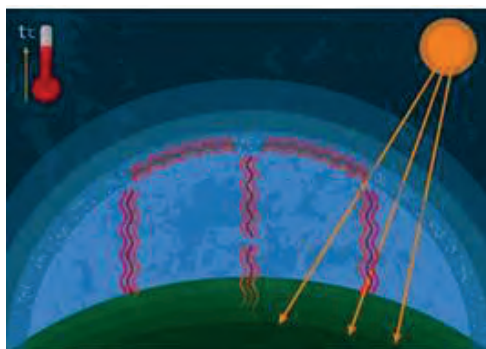


Fig 8.4.2 Warming of atmosphere

- Of the man-made greenhouse gases (GHGs), the most important are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and the halocarbons (CFCs, HCFCs and HFCs).
- Explain that the warming effect over time of different gases is compared using an index called the global warming potential (GWP).
- Explain to the participants that the adverse impact of refrigerants on environment resulting in ozone depletion led to the development of the Montreal Protocol in 1987. The Protocol was ratified by India in 1992.
- Tell that the Montreal Protocol requires an end to the consumption and production of all CFCs and HCFCs.
- Inform them that India is an Article 5 party to the Montreal Protocol, it needs to phase-out HCFCs as per the accelerated phase-out schedule:

Level	Year
Baseline	Average of 2009 and 2010
Freeze	2013
10% reduction (90% of baseline)	2015
35% reduction (65% of baseline)	2020
67.5% reduction (32.5% of baseline) 2	2025
Total phase-out	2030
2.5 % of baseline	2030 - 2040

Fig 8.4.3 Accelerated phase out schedule

- Since then the refrigeration and air conditioning (RAC) industry has been engaged in establishing substitutes for ozone depleting refrigerants.
- Inform them that there is now a greater attention towards adopting alternative refrigerants with low or no GWP, as well as zero ODP).
- Explain that the adverse impact of refrigerants on environment resulting in global warming led to the development of the Kyoto Protocol signed in 1997 and entered into force in 2005.



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

9. Refrigeration

Unit 9.1 - Uses of Refrigeration and Refrigeration Cycle

Unit 9.2 - Basic Components

Unit 9.3 - Properties, Comfort Zone and Heat Load

Unit 9.4 - Types of ACs



ELE/N3117

Key Learning Outcomes

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

- Explain refrigeration method, list out uses & explain refrigeration cycle
- Explain working of basic components in refrigeration cycle
- Explain the method of air conditioning, comfort zone and calculate heat load
- Identify & compare features of different types of ACs such as window, split and cassette.

UNIT 9.1: Uses of Refrigeration and Refrigeration Cycle

Unit Objectives

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

- Define refrigeration
- Identify the uses of refrigeration
- Explain refrigeration cycle

Notes for Facilitation

- Explain that refrigeration can be referred to as the process of preserving a substance by storing it in a system which is designed to cool or freeze the substance.
- Explain that refrigeration was developed as food storage technique after it was discovered that lower temperatures lead to decrease in the growth rate of bacteria.
- Explain that refrigeration has use in different applications such as:

Household refrigerators

- It consists of heat pump and a thermally insulated compartment.
- It maintains a temperature which is few degrees above the freezing point of water, around 3 to 5 degrees C.

Industrial freezers

- It maintains a temperature below the freezing point of water, from -23 to -18 degree C.

Cryogenics

- It is the study of how materials behave at very low temperatures such as -150 degrees C.
- Refrigeration helps to produce and maintain such low temperatures.

Air conditioning

- It is the process of removing heat from a confined space leading to cooling of air and removal of humidity.
- The cooling is achieved through refrigeration cycle.

Fig 9.1.1: Refrigeration applications

- Refer to the notes of facilitation described in unit 1.1 for a quick recap of the concept of refrigeration.

UNIT 9.2: Basic Components

Unit Objectives

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

- Explain working of basic components in Refrigeration cycle

Notes for Facilitation

- Explain that refrigeration implies the reduction of the temperature of a particular space or any substance.
- Explain the refrigeration process with the help of the following figure:

Typical refrigeration cycle

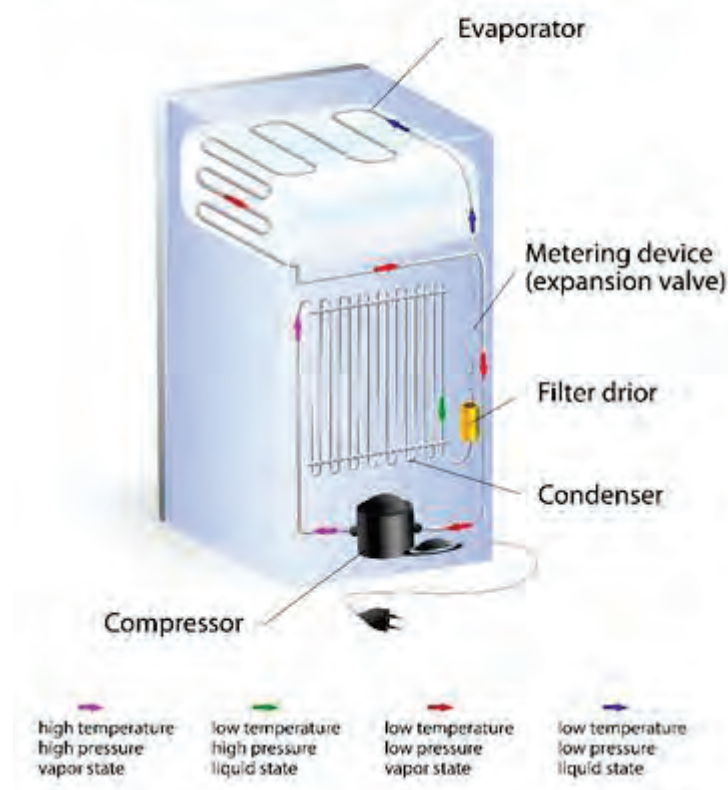


Fig 9.2.1: Refrigeration cycle

- Explain the process happening in different components of the refrigerator:
 - Evaporator: The liquid refrigerant is at low pressure in a heat exchanger. It absorbs heat from the substance to be cooled and changes to vapour.
 - Compressor: The low pressure refrigerant vapour enters the compressor and gets compressed. The pressure and temperature of the refrigerant increases and it becomes highly superheated.
 - Condenser: Heat is rejected to a suitable sink such as cooling liquid and starts condensing to a liquid state. The condensed refrigerant is sub cooled.
 - Capillary: As the high pressure condensed liquid refrigerant flows through the capillary, its pressure decreases.

UNIT 9.3: Proper Uses, Comfort Zone and Heat Load

Unit Objectives

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

- Explain air conditioning and its proper uses
- Calculate heat load

Notes for Facilitation

- Explain that air conditioning refers to the process of altering the temperature and humidity conditions of surrounding air for the purpose of creating an ambient atmosphere to meet the comforts of the occupants.
- Explain that the air conditioners provide cooling through the system of refrigerant cycle.
- Explain air conditioning process with the help of the following figure:

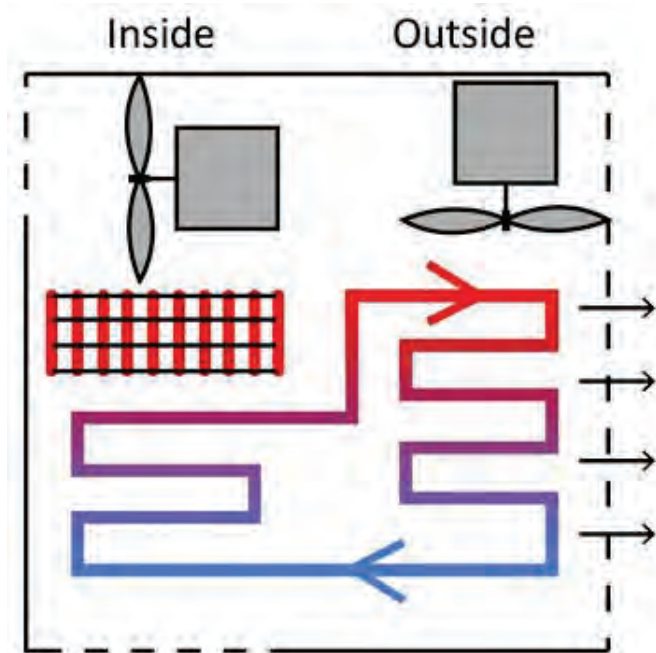


Fig 9.3.1: Air conditioning process

- Explain the steps of air conditioning process:
 - The grill at the bottom of the machine sucks in warm air
 - The air flows over chiller pipes. These pipes circulate a coolant fluid such as a refrigerant. The incoming air cools down and the excess moisture is removed.
 - The air flows over a heating element.
 - The air gets blasted into the room through another grill by a fan at the top of the unit.
 - The air blowing past the chiller pipes heats up the refrigerant. The cool liquid turns into a hot gas and carries the heat from inside the room to the outside of the building.

- The unit outside the building contains metal plates that scatter the heat to the atmosphere. An electric fan accelerates the process by blowing air past them.
- The heat inside the building gradually pumps away into the outside air.
- Explain that the human comfort zone is that range of temperature, air movement and humidity conditions that people find comfortable to stay in most of the time.
- Explain the factors that influence human comfort with the help of the following figure:



Fig 9.3.2: Factors influencing human comfort

- Explain that a room gains heat from different sources such as occupants, electrical equipment, outside warm air and solar radiation.
- Explain that the sum of all these heat sources is called heat load and is measured in BTU or kilowatts (kW).
- Explain that the output of an air conditioner must be greater than the heat load for it to cool a room.

UNIT 9.4: Types of ACs

Unit Objectives

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

- Identify different types of ACs and their features

Notes for Facilitation

- Explain the different types of air conditioners with the help of the following figure:

Unitary AC System	• A single box containing all the components: the condenser, evaporator, compressor, cooling coil, and expansion valve.
Window AC	• The unit is fitted in a window sill or a slot in the room's wall.
Split AC	• The system is made up of two units, one indoor and one outdoor
High Wall AC	• Type of split AC where the indoor unit is mounted on the inside wall of a room
Tower AC	• Type of split AC where the indoor unit stands on the floor
Cassette AC	• Type of split AC where the cassette or indoor unit is flushed to the ceiling
Cube AC	• The unit is a cube shaped split AC that can be mounted close to a ceiling or at the window level.
Central AC Systems	• The compressor unit is located outside and an indoor coil cools air that is distributed throughout the house via ducts
Package AC	• The compressor unit is located outside and cooled air flows through the ducts laid within various rooms.
Central Plant	• Type of central AC where the components of a large outdoor unit are kept in a plant room.

Fig 9.4.1: Different type of air conditioner

- Explain the comparison between window, split and cassette air conditioners.



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

10. Window AC - I

Unit 10.1 - Parts and Working

Unit 10.2 - Safety Precautions

Unit 10.3 - Installation

Unit 10.4 - Test Run



ELE/N3114
ELE/N3115

Key Learning Outcomes

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

- Explain the working of window AC
- Identify the parts of window AC & their function
- Explain precautions of installation
- Install window AC
- Perform test run after installation

UNIT 10.1: Parts and Working

Unit Objectives

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

- Explain the parts of window AC
- Explain the working of window AC

Notes for Facilitation

- Explain that a window or a room air conditioner is designed to be mounted on window sills.
- Explain that it is a single unit where all the components are located in a single box.
- Explain that there is a double shaft fan motor in the refrigerator unit. Two fans, one on evaporator side and one on condenser side are mounted on both sides of the motor.
- Tell them that the evaporator side, which cools the space, faces the room and the condenser side is outside.
- Tell them that the indoor side has a front panel containing user interface control system that enables the user to control the functions of AC using a remote and a touch panel with digital display.
- Next, tell them that the front panel has adjustable horizontal and vertical fins which control and adjust the direction of air flow to suit the user preference.
- Explain that the front panel also has a provision for providing fresh intake of air or ventilation.
- Explain that the components of window AC can be divided into:
 - Indoor Side Components
 - Outdoor Side Components
- Explain the indoor side components with the help of the following figure:

Cooling Coil	• Is used for heat exchange between the refrigerant and the room air.
Fan Blower	• Is used to discharge the cooled air into the room. It is a centrifugal evaporator blower.
Capillary Tube	• Is used as an expansion device
Operation Panel	• Is used to control the temperature and speed of the blower fan
Filter Drier	• Is used to remove the moisture from the refrigerant
Drain Pan	• Is used to collect the water that condenses from the cooling coil and discharge it out

Fig 10.1.1: Indoor side components

- Explain that the outdoor side components with the help of the following figure:

Compressor	<ul style="list-style-type: none">• Is used to compress the refrigerant
Condenser coil	<ul style="list-style-type: none">• Is used to reject heat from the refrigerant to the outside air
Propeller fan	<ul style="list-style-type: none">• Is used to help move the air molecules over the surface of the condensing coil
Fan motor	<ul style="list-style-type: none">• Has a double shaft to connect indoor and outdoor Fans

Fig 10.1.2 Outdoor side components

UNIT 10.2: Safety Precautions

Unit Objectives

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

- Explain safety precautions for installing a window AC

Notes for Facilitation

- Explain that the term 'safety' refers to safety of technician, customer and even of the tools and equipment.
- Explain that the most important safety precaution that a technician must take is personal safety.
- Explain that a technician should take the following steps to maintain safety at workplace:



Fig 10.2.1: Steps to maintain safety at workplace

- Explain that a technician must always use personal protective equipment (PPE) at work to keep potential hazards at bay. The following figure displays a few examples of PPE:



Fig 10.2.2 Examples of PPE

- Tell them that they should always carry a fire extinguisher to the place of installation or service as a safety measure in case of an accidental fire.
- Explain that they should know that fire extinguishers are classified into following three groups:
 - Class A fire extinguishers: Designed for use on fire occurring from burning wood, paper, or other ordinary combustibles.
 - Class B fire extinguishers: Designed for use on fire caused due to flammable liquids like grease, petrol or oil.
 - Class C fire extinguishers: Designed for use on electrical fires.
- Explain that while working on air conditioners, the use of ABC powder-type fire extinguisher is ideal.

- Explain that while installing or servicing air conditioners, the technician must follow the following basic safety measures:

Always keep the servicing manual handy

Use only recommended spare-parts

Always verify the correct operating pressures of the refrigerants

Use calibrated pressure gauges

Charge only through low side of the system

Ensure that the entire refrigerant has been removed from the system

Fig 10.2.3: Basic safety measures

UNIT 10.3: Installation

Unit Objectives

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

- Install Window AC

Demonstrate

- The way to install window AC

Notes for Facilitation

- Explain that it is very important to implement correct installation practices while working.
- Explain that incorrect installation of the unit can lead to:
 - High electricity bills
 - Poor air circulation
 - Reduced capacity and efficiency
 - Maintenance problems
- Explain that the technician must follow the safety and good service practices while installing air conditioners.
- Explain that the technician should always carry the following set of tools and equipment for installation of air conditioners:
 - A screw driver set
 - Knife or wire stripper
 - Steel tape measure
 - Spirit level
 - Hacksaw
 - Hammer
 - Drilling machine, Core bits for drilling
 - Tube cutter, bender, flaring and deburring tool
 - Torque wrench and Adjustable wrench
 - Refrigeration (thermal) insulation tape
 - Insulated staples for connecting electrical wires
 - Putty
 - Clamps or saddles to protect the refrigerant tubes
 - Thermometer
 - Multimeter or clamp tester
 - Gauge manifold

- Thermometer
- Vacuum pump
- Explain that before starting the installation, the technician must verify the electrical connections for rated current, voltage and phase connections.
- In addition, the technician should verify that earthing is provided as per the national standards.
- Show the step by step process of installing a window AC. Emphasize on the important points they should keep in mind.
- Explain the importance of following manufacturer's guidelines while installation.
- Reassert the safety precautions that should be taken at every step.

UNIT 10.4: Test Run

Unit Objectives

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

- Demonstrate test run

Demonstrate

- The way to test run Window AC after installation

Notes for Facilitation

- Explain that after an AC has been installed it is important to perform test run.
- Explain that a test run enables the technician to check and ensure that the air conditioner has been installed correctly and is functioning properly.
- Explain that they should check the current drawn by the AC, the outside temperature, the return temperature and the grill temperature.



Skill India
कौशल भारत - कुशल भारत



Skilling India in Electronics

11. Window AC - II

Unit 11.1 - Wiring Diagram

Unit 11.2 - Test Electronic Components

Unit 11.3 - Fault Finding of Window AC

Unit 11.4 - To Perform PMS of Window AC



ELE/N3114
ELE/N3115

Key Learning Outcomes

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

- Read the wiring diagram of window AC
- Test electrical/electronic components of window AC
- Find the fault for given symptom
- Install window AC
- Perform dry, wet service of window AC

UNIT 11.1: Wiring Diagram

Unit Objectives

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

- Explain wiring diagram of window AC

Do

- Take an enlarged copy of the wiring diagram.

Demonstrate

- The way to read a wiring diagram.

Notes for Facilitation

- Explain that before installing a window AC, the technician must know two things:
 - Specifications of system
 - The way different components of the system connect to each other
- Explain that the electrical wiring diagrams help the technician in understanding the above two concerns.
- Explain that the wiring diagram is provided by the manufacturer of the equipment.
- Inform them that there are five components of any wiring diagram, as shown in the following figure:

A power supply

A path for the power

A load or component that operates from the power

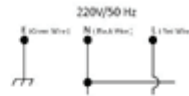
A switch or component that interrupts the power supply to the load

A legend or key that explains the various symbols and abbreviations used in the wiring diagram

Fig 11.1.1: Component of wiring diagram

- Explain that there are three basic types of wiring diagrams:
 - The Ladder Diagram
 - The Line Diagram
 - The Installation Diagram
- Explain that in ladder diagram, the symbols used to represent the components in the system are placed on the rungs of a ladder.
- Explain that in line diagram, instead of the symbols, the drawings resemble the components themselves.
- Explain that installation diagram is used by the installing contractor and shows only the terminal board connections instead of the internal wiring of the unit.
- Explain that to be able to read the wiring diagram, the technician should know:
 - Symbols used in schemas
 - Schematic diagram configurations
 - Schematic diagram locators
- Explain that the most important symbols used in wiring diagrams are:

Power Supplies:



Loads:



Wiring:



Switches:

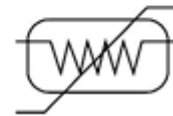


Fig 11.1.2: Symbols used in wiring diagram

UNIT 11.2: Test Electronic Components

Unit Objectives

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

- Perform testing of electronic component of window AC

Demonstrate

- The way to test the electronic components of window AC with the help of multimeter

Notes for Facilitation

- Ensure access to a working window AC.
- Ensure that you carry a multimeter with you.
- Check that the multimeter is working properly.
- Explain that it is important to test the resistance of electronic components of window AC such as coil sensor, grill sensor, swing motor and compressor terminal.
- Explain that testing enables the technician to check and ensure that the electronic components are functioning properly.
- Explain that they should ensure that the multimeter is set on ohms before they start the testing.
- Explain the importance of noting down the test results and any observation they make. This ensures that a record is kept of the tests undertaken.

UNIT 11.3: Fault Finding of Window AC

Unit Objectives

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

- Explain how to find fault of window AC and repair it

Do

- Carry a multimeter.

Demonstrate

- The way to find and rectify the faults of a window AC

Notes for Facilitation

- Ensure access to a working window AC.
- Ensure that you carry a multimeter with you.
- Check that the multimeter is working properly.
- Explain that it is important to follow correct step by step procedure when trying to isolate the reason behind any fault in the working of an AC.
- Explain the importance of wearing safety gear and having a fire extinguisher.
- Explain that the technician should follow precautions such as:
 - Before opening the unit, be sure to turn the power off at the mains.
 - Be sure to keep your fingers and clothing away from any moving parts.
 - Ensure that no metal scraps or wire bits are left inside the unit after you finish servicing.
 - Always clean up the site after you finish servicing.
- Explain the importance of noting down the test results and any observation they make. This ensures that a record is kept of the faults found and the reason behind those faults.

UNIT 11.4: To Perform PMS of Window AC

Unit Objectives

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

- Perform preventive maintenance service (PMS) of Window AC

Notes for Facilitation

- Explain that preventive maintenance is necessary in the servicing of air conditioners. Planned or scheduled maintenance enhances the life, performance, reliability and stability of the air conditioner.
- Explain that preventive maintenance should be carried out both by the customer and the technician.
- With the help of the following figure, explain that the customer should:

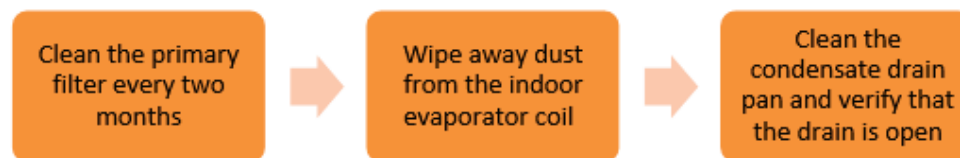


Fig 11.4.1: Customer role

- Explain the preventive maintenance tasks that the technician should perform with the help of the following figure:

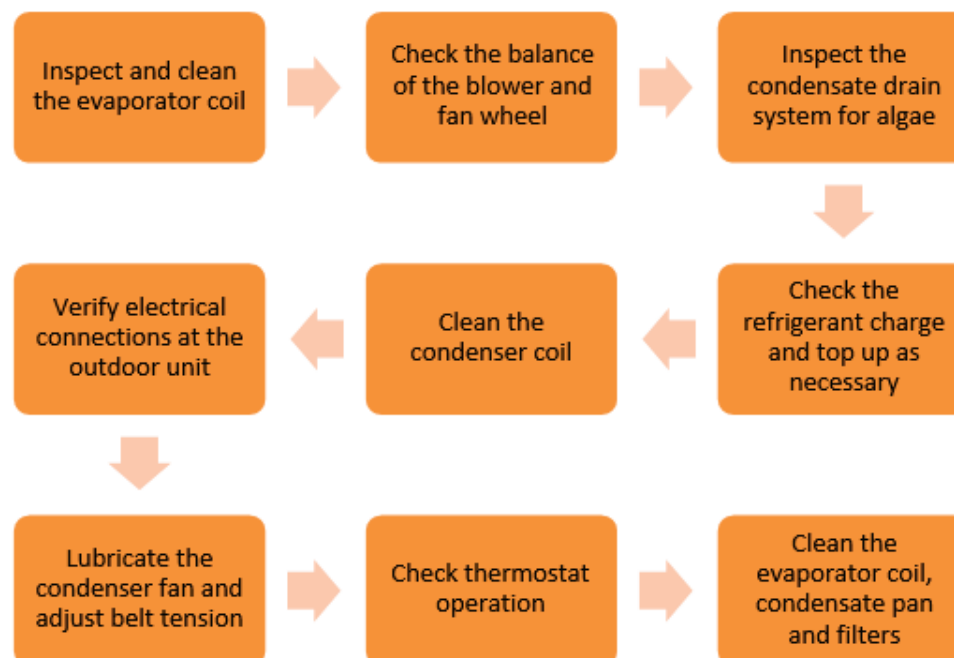


Fig 11.4.2: Preventive maintenance tasks



Skil India
कौशल भारत - कुशल भारत



Skilling India in Electronics

12. Split AC

Unit 12.1 - Parts and Working

Unit 12.2 - Safety Precautions

Unit 12.3 - IDU and ODU Installation and Connecting IDU and ODU

Unit 12.4 - Test Run

Unit 12.5 - Wiring Diagram

Unit 12.6 - Testing of Electrical Component

Unit 12.7 - PMS (Dry and Wet Services)



ELE/N3114

Key Learning Outcomes

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

- Explain the working of split AC and identify the parts & their function
- List the various safety precautions of installation
- List the site requirements of split AC installation
- Install split AC IDU
- Install split AC ODU
- Connect IDU and ODU using copper and power cables
- Differentiate between standard and non-standard installation
- Perform test run after installation
- Read the wiring diagram of split AC
- Test electrical/electronic components of split AC
- Find the fault for given symptom
- Perform Dry Service of split AC
- Perform Wet Service of split AC

UNIT 12.1: Parts and Working

Unit Objectives

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

- Explain about Parts & Working of Split AC

Notes for Facilitation

- Explain that a split air conditioner is one of the most widely used types of air conditioners.
- Explain that it is so called because components are divided into inside and outside portions as opposed to being located together in a single unit.
- Explain that the advantages of split air are:
 - Ability to cool large areas
 - Silent operation
 - Elegant looks
 - Window space is freed
 - Better EER
- Explain that a split air conditioner consists of:
 - The indoor unit (IDU): located inside the room that has to be cooled
 - The outdoor unit (ODU): located outside in open space
 - Copper tubing: connects the indoor and the outdoor units
- Explain the outdoor unit components with the help of the following figure:

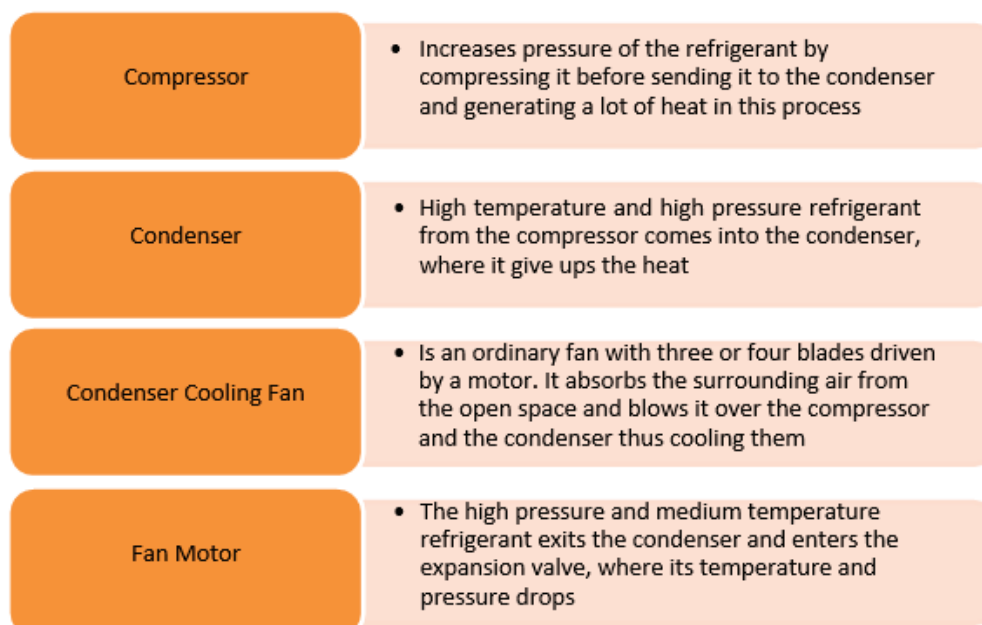


Fig 12.1.1: Outdoor unit components

- Explain the indoor unit components with the help of the following figure:

Evaporator Coil	<ul style="list-style-type: none">• Cools the hot room air
Air Filter	<ul style="list-style-type: none">• Removes the dirt particles from the room air and supplies clean air to the room
Blower	<ul style="list-style-type: none">• Sucks the hot and unclean air from the room and supplies back cool and clean air
Drain Pipe	<ul style="list-style-type: none">• Removes dew water collected inside the indoor unit and drains it outside
Louvers or Fins	<ul style="list-style-type: none">• Help to change the angle or direction in which the air is supplied into the room

Fig 12.1.2: Indoor unit components

UNIT 12.2: Safety Precautions

Unit Objectives

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

- Explain the safety precautions while installing split AC

Notes for Facilitation

- Tell the participants that to ensure safe installation of the unit, a technician should:
 - Read the instruction manual carefully
 - Follow each instruction exactly as shown
 - Observe all electrical codes
- Explain that the technician should take following special precautions:
 - While wiring:

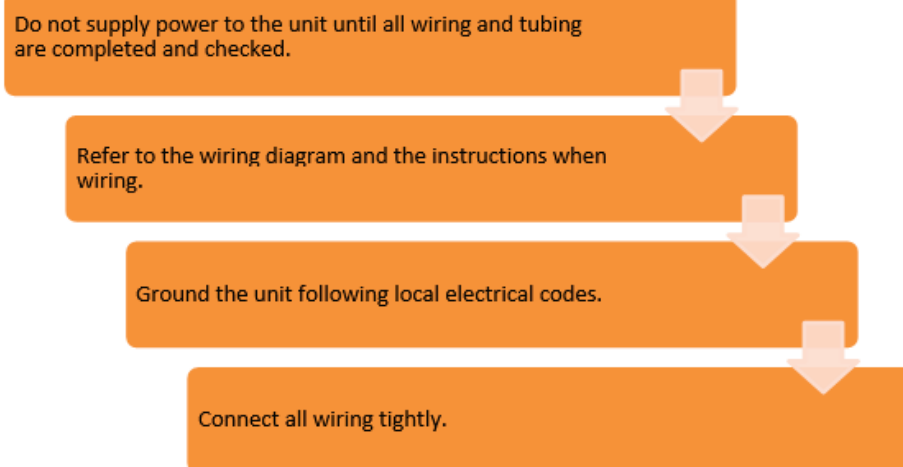


Fig 12.2.1: Precaution while wiring

- While transporting:

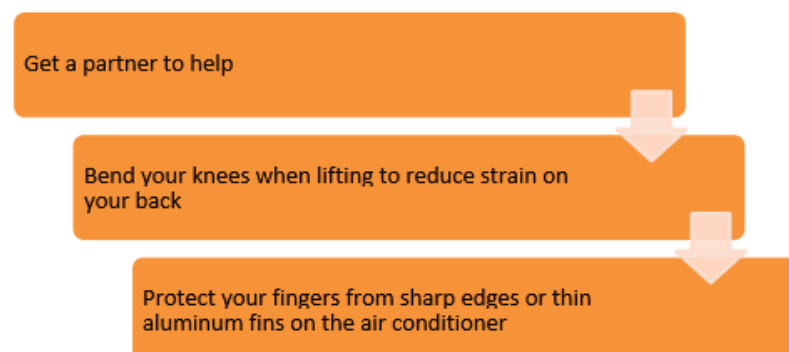


Fig 12.2.2: Precautions while transporting

- When installing:

Ensure that the wall is strong enough to hold the weight of the unit

Properly insulate any tubing running inside a room to prevent dripping of water

Securely anchor the outdoor unit down with bolts and a metal frame

Fig 12.2.3: Precautions while installing

- When connecting refrigerant tubing:

Use the flare method for connecting tubing.

Apply refrigerant lubricant to the surfaces of the flare and union tubes before connecting them.

Check carefully for leaks before starting the test run

Fig 12.2.4: Precautions while connecting refrigerant

UNIT 12.3: IDU and ODU Installation and Connecting IDU and ODU

Unit Objectives

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

- Install split AC IDU, ODU
- Connect IDU and ODU

Do

- Carry the complete set of tools needed for installation.

Demonstrate

- The way to install split AC IDU, ODU
- The way to connect IDU and ODU

Notes for Facilitation

- Explain that it is very important to implement correct installation practices while working.
- Explain that incorrect installation of the unit can lead to:
 - High electricity bills
 - Poor air circulation
 - Reduced capacity and efficiency
 - Maintenance problems
- Explain that the technician must follow safety and good service practices while installing air conditioners.
- Explain that the technician should always carry the complete set of tools and equipment for installation of air conditioners.

UNIT 12.4: Test Run

Unit Objectives

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

- Test run split AC after installation

Demonstrate

- The way to test run split AC after installation

Notes for facilitation

- Explain that after an AC has been installed it is important to perform a test run.
- Explain that a test run enables the technician to check and ensure that the air conditioner has been installed correctly and is functioning properly.
- Explain that they should check that the:

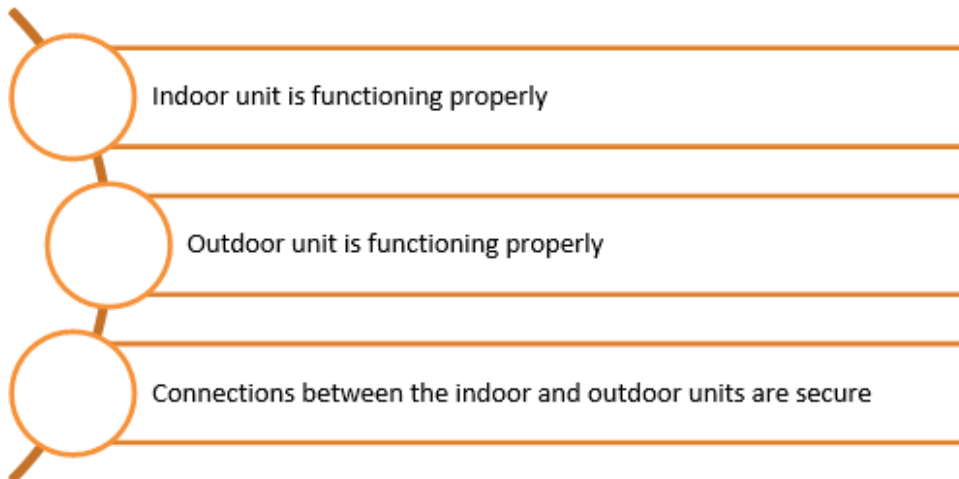


Fig 12.4.1: Functioning checklist

UNIT 12.5: Wiring Diagram

Unit Objectives

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

- Read a wiring diagram

Do

- Take an enlarged copy of the wiring diagram.

Demonstrate

- The way to read a wiring diagram

Notes for facilitation

- Explain that before installing a split AC, the technician must know two things
 - Specifications of system
 - The way different components of the system connect to each other
- Explain that the electrical wiring diagrams help the technician in understanding the above two concerns.
- Explain that the wiring diagram is provided by the manufacturer of the equipment.
- Refer to the facilitation notes explained in unit 11.1.

UNIT 12.6: Testing of Electrical Component

Unit Objectives

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

- Perform testing of electronic component of window AC

Demonstrate

- The way to test the electronic components of split AC with the help of multimeter

Notes for Facilitation

- Ensure access to a working window AC.
- Ensure that you carry a multimeter with you.
- Check that the multimeter is working properly.
- Explain that it is important to test the resistance of electronic components of split AC such as coil sensor, grill sensor, swing motor, indoor blower motor and louver motor.
- Explain that testing enables the technician to check and ensure that the electronic components are functioning properly.
- Explain that they should ensure that the multimeter is set on ohms before they start the testing.
- Explain the importance of noting down the test results and any observation they make. This ensures that a record is kept of the tests undertaken.

UNIT 12.7: PMS (Dry and Wet Services)

Unit Objectives

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

- Perform preventive maintenance service (PMS) of split AC

Notes for Facilitation

- Explain that preventive maintenance is necessary in the servicing of air conditioners. Planned or scheduled maintenance enhances the life, performance, reliability and stability of the air conditioner.
- Explain that preventive maintenance should be carried out both by the customer and the technician.
- With the help of the following figure, explain that the customer should:

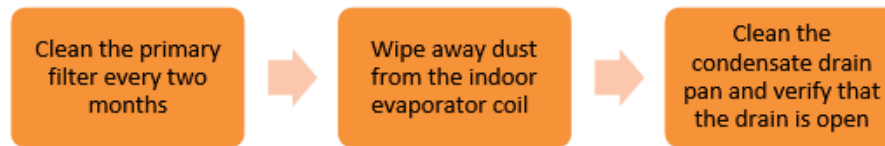


Fig 12.7.1: Role of a customer

- Explain the preventive maintenance tasks that the technician should perform with the help of the following figure:

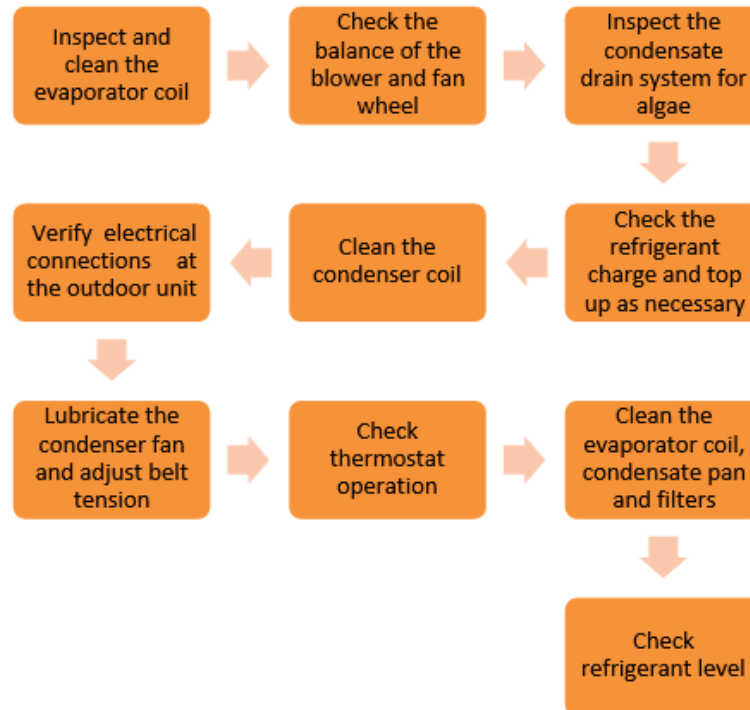


Fig 12.7.2 Preventive maintenance tasks





Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

13. Inverter Technology

Unit 13.1 - Advantages

Unit 13.2 - Controllers



Key Learning Outcomes

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

- Compare inverter & non-inverter technology
- Identify controllers of inverter AC and explain their function

UNIT 13.1: Advantages

Unit Objectives

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

- Explain about advantages of inverter

Notes for Facilitation

- Tell the participants that an inverter is an electronic device that changes direct current (DC) into alternating current (AC).
- Explain that in a regular air conditioner, the compressor is constantly turned on and off. When the desired temperature is attained, the compressor switches off and when the temperature rises, it starts again.
- Tell them that this creates excessive noise and leads to wastage of energy.
- Explain that the inverter technology automatically changes the speed of the compressor to maintain the desired temperature. The compressor is always on, but it draws varying power.
- Tell them that this leads to reduction in noise and energy consumption.
- Explain the working of inverter air conditioners with the help of the following figure:

Air conditioner operates at maximum capacity on starting

Inverter raises compressor speed

Refrigerant flow is increased

Desired temperature is reached quickly

Fig 13.1.1: Working of inverter air conditioner

- Explain the advantages of inverter technology with the help of the following figure:



Fig 13.1.2 Advantages of inverter technology

UNIT 13.2: Controllers

Unit Objectives

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

- Explain about controllers of inverter

Notes for Facilitation

- Tell the participants that the controller is a device that contains sensors, logic and actuators.
- Explain that controllers:
 - Receive input from central unit and send device specific control signals to the device they control.
 - Manage and direct the flow of current, data or communications between two entities.
- Explain that controllers help to maintain the performance of the components of the system.
- Give an example that a variable speed motor controller controls the speed of a motor.
- Illustrate by taking the case of air conditioners, where the indoor unit has a:
 - remote control sensor to sense the commands and accordingly control the output
 - return air sensor to monitor the temperature of air and take decision accordingly
 - coil sensor to sense the temperature of outside coil
- Explain that there are two types of controllers:

Closed loop controllers:

- Also known as feedback controllers
- Found in air conditioners, electric iron and so on.

Open loop controllers:

- There is no feedback loop
- Found in automatic washing machines, toasters and so on.

Fig 13.2.1: Type of controllers



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

14. 4 Way Valve

Unit 14.1 - Cooling and Heating Mode



Key Learning Outcomes

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

- Explain working of 4-way valve in heating and cooling mode

UNIT 14.1: Cooling and Heating Mode

Unit Objectives

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

- Explain the working of four-way valve

Do

- Carry a four-way valve.

Demonstrate

- The working of four-way valve

Notes for Facilitation

- Tell the participants that the four-way valve is a device that has four equally spaced ports around a valve chamber. It has a plug that has two passages to connect the adjacent ports.

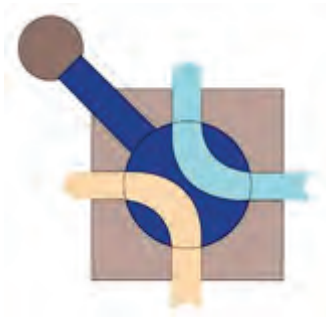


Fig 14.1.1: Four way valve

- Explain that the valve changes the flow of refrigerant in the desired direction.
- Tell that this allows the heat pump to reverse the refrigeration cycle from heating to cooling or vice versa.
- Explain that the four-way valve is used to heat or cool a building using the same equipment.
- Explain that the valve swaps the functions of evaporator and condenser to change from heating to cooling.



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

15. Refrigerator

Unit 15.1 - Need and Types (DC, FF and Pel er)

Unit 15.2 - Safety Rules, Policies and Procedures



ELE/N3112

ELE/N3113

Key Learning Outcomes

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

- Explain the need of refrigerator
- Compare & identify different types of refrigerators
- List precautions of installation & policies and procedures of company

UNIT 15.1: Need and Types (DC, FF and Pelier)

Unit Objectives

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

- Explain the need of refrigerator
- Compare different types of refrigerators

Notes for Facilitation

- Explain that based on their ability to defrost, refrigerators can be classified into two types:
 - Direct Cool (DC)
 - Frost Free
- Tell that the direct cool refrigerators work on the principle of natural convection that produces a cooling effect which is then circulated.
- Explain that the frost free refrigerator uses the self-defrosting technique to regularly defrost the evaporator in a refrigerator.
- Tell that the direct cool refrigerators are single door refrigerators.
- Inform them that frost free refrigerators are of three types:
 - Double door
 - Top freezer: A small freezer occupying approx. one third of the space, is on the top and the refrigerator is on the bottom. It is the most economical and energy efficient model.
 - Bottom freezer: The freezer is on the bottom and the refrigerator is on top. It is less efficient and more expensive than the top-freezer model.
 - Side-by-side: The refrigerator is split in half vertically. One side is freezer and the other, fridge. It is wider than the above models and the doors open from the centre.
 - Triple door: Also known as the French door refrigerator, it has bottom third space dedicated to freezer and two side by side doors on the top that open to one, large space inside.
 - Four door: A variation of French door refrigerator, where the freezer section is also split in two, thus making four doors on the fridge.
- Explain that Pelier refrigerators also known as thermoelectric coolers are solid state heat pumps that move heat from one side of the device to other by making use of Pelier effect.
- Inform that in the 19th century, a French physicist, Jean Pelier, discovered the principle of thermoelectric cooling.
- Explain that Pelier effect states that when a current is passed through two different types of conductors (a thermocouple), it creates a heat flux. Depending on the direction of current, the overall effect could be either heating or cooling.

- Explain the construction of a thermoelectric module with the help of the following figure:

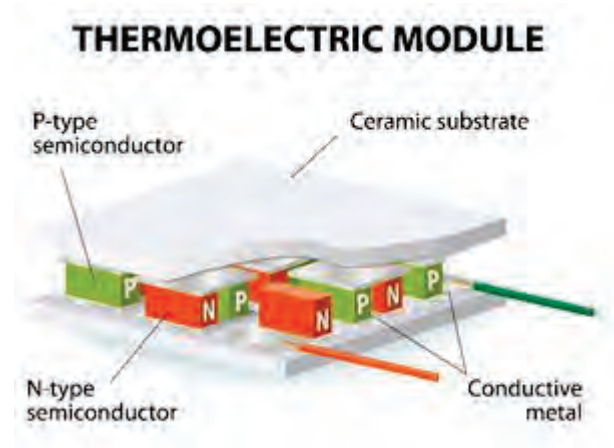


Fig 15.1.1: Thermoelectric module

UNIT 15.2: Safety Rules, Policies and Procedures

Unit Objectives

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

- Explain safety precautions, policies and procedures

Demonstrate

- The way to clean and maintain the refrigerator

Notes for Facilitation

- Tell the participants that simple maintenance and cleaning procedures can help increase the life and efficiency of a refrigerator.
- Explain that the technician should inform the consumer about the safety precautions that a consumer should follow while operating a refrigerator.
- Tell that, to avoid any risk of personal injury, the following safety precautions should be practiced:
 - Ensure that the power plug is away from the rear of the refrigerator
 - Never spray water directly on the refrigerator.
 - Do not bend the power cord excessively.
 - Do not insert power plug with wet hands.
 - Do not put a container filled with water on top of the refrigerator.
 - Do not store flammable substances in the refrigerator.
 - Do not place the refrigerator near heat source or direct sunlight.
 - Ensure that the unit is placed on flat, level surface.
- In addition, tell that to ensure that the food kept in a refrigerator is safe, follow these two rules:

Right temperature

- Ensure that the air temperature inside the fridge is less than 38 degree F.

Right placement

- Ensure that to enable cool air to circulate, the refrigerator is not overloaded.

Fig 15.2.1: Rules of keeping food in refrigerator



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

16. DC Refrigerator

Unit 16.1 - Working (Cooling Cycle, Frost and Defrost Method)



ELE/N3112
ELE/N3113

Key Learning Outcomes

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

- Explain the working of DC refrigerator
- Compare & identify different compartments in DC refrigerator and list out their uses
- Identify different parts in DC refrigerator and explain their working
- List the site requirements of DC refrigerator installation
- Perform test run after installation
- Give demo of DC refrigerator and explain about features and other products of company

UNIT 16.1: Working (Cooling Cycle, Frost and Defrost Method)

Unit Objectives

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

- Explain the working of DC refrigerator
- Explain compartments in DC refrigerator
- Explain the working of different parts in DC refrigerator
- Explain the site requirements and installation of DC refrigerator
- Explain the steps involved in test run
- Give demo and explain features

Demonstrate

- The working of DC refrigerator
- The compartments of DC refrigerator
- The steps involved in test run

Notes for Facilitation

- Tell the participants that DC refrigerators are single door refrigerators with a freezer on top and a refrigerator chamber at the bottom.
- Explain the various compartments in the DC refrigerator.
- Explain the wiring diagram of the DC refrigerator.
- Explain that the following points should be taken care of when installing a DC refrigerator:
 - Ventilation:
 - Ensure that there is adequate flow of fresh air.
 - Ensure that the combustion system of refrigerator is isolated from the living space.
 - Ensure that the inlet is below the level of outlet.
 - Ensure that there is a distance of minimum one inch between the rearmost part of the refrigerator and the wall.
 - Ensure that the floor is flat and level.
 - Ensure that there are no heat sources nearby.
 - Electrical:
 - Ensure that all the relevant regulations and codes of practice are followed.
 - Ensure that the unit is properly earthed.
 - Ensure that the electrical leads are properly routed and secured.

Explain that once the installation is complete, the technician should test the operation of the refrigerator.

- Explain that after doing the test run, the technician should give a demo to the consumer and instruct the consumer on the correct way to operate and maintain the DC refrigerator.
- Refer to the maintenance tips to be given to the consumer as explained in unit 15.2.



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

17. FF Refrigerator

Unit 17.1 - FF Refrigerator



ELE/N3112
ELE/N3113

Key Learning Outcomes



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

- Explain the working of FF refrigerator
- Compare & identify different compartments in FF refrigerator
- List out their uses
- Identify different parts in FF refrigerator and explain their working
- List the site requirements of FF refrigerator installation
- Find out the best place to install in class/practical room & install refrigerator
- Perform test run after installation
- Give demo of FF refrigerator and explain about features and other products of company

UNIT 17.1: FF Refrigerator

Unit Objectives

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

- Explain the working of FF refrigerator
- Explain the uses of different compartments in FF refrigerator
- Explain the working of different parts in FF refrigerator
- Explain the site requirements and installation of FF refrigerator
- Explain the process of test run in FF refrigerator

Demonstrate

- The working of FF refrigerator
- The compartments of FF refrigerator

Notes for Facilitation

- Tell the participants that the Frost Free (FF) refrigerators are multi-door units that use the auto-defrost technique.
- Explain that a FF refrigerator has three basic parts:
 - Timer: Turns on the heating coil every six hours
 - Heating coil: Melts the ice on the freezer coils
 - Temperature sensor: Turns on the heater when the temperature rises above 0 degrees C.
- Explain the defrost system of the FF refrigerator.
- Explain that the defrost system consists of a motorized device called the defrost control.
- Explain that it is a mechanical timer that opens and closes electrical contacts.
- Explain that one of the electrical contacts connects the cooling system and the other connects the defrost heater circuit.
- Explain that when one of these circuits is switched on the other is switched off.
- Explain the different compartments of the FF refrigerator.
- Explain the different parts of the FF refrigerator and their working.



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

18. Install DC and FF Refrigerator

Unit 18.1 - Installation of DC and FF Refrigerator



ELE/N3112
ELE/N3113

Key Learning Outcomes

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

- Install DC & FF refrigerator

UNIT 18.1: Installation of DC and FF Refrigerator

Unit Objectives

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

- Install DC & FF refrigerator

Demonstrate

- The way to install DC refrigerator
- The way to install FF refrigerator

Notes for Facilitation

- Tell the participants that it is very important to implement correct installation practices while working.
- Explain that before starting installation, they should:
 - Measure the area where the unit will be installed to ensure that all the sides are clear.
 - Measure the path of delivery to ensure that the unit can be transported safely.
- Tell that they should keep in mind the following points:

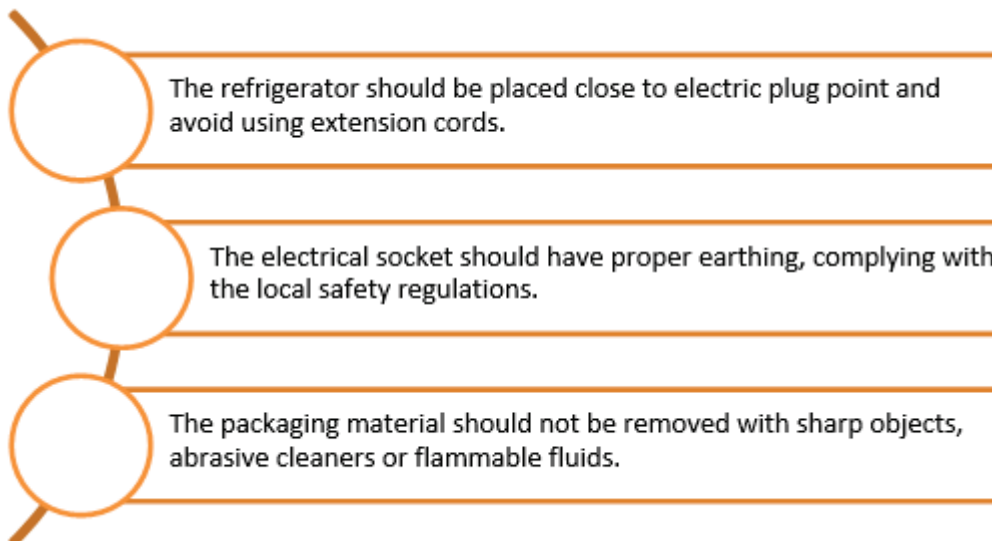


Fig 18.1.1: Point to kept in mind while placing refrigerator



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

19. To Repair DC and FF Refrigerator

Unit 19.1 - Repair DC and FF Refrigerator



ELE/N3112
ELE/N3113

Key Learning Outcomes

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

- Repair DC and FF refrigerator

UNIT 19.1: Repair DC and FF Refrigerator

Unit Objectives

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

- Repair DC & FF refrigerator

Demonstrate

- The way to repair DC refrigerator
- The way to repair FF refrigerator

Notes for Facilitation

- Tell the participants that it is very important to follow correct diagnostic procedures while trying to repair any fault in the refrigerators.
- Explain that every fault has a cause and a remedy associated with it. They just need to isolate the cause.
- Explain that they should take certain precautions while repairing refrigerators:

Make a proper diagnosis of the problem.

Observe all safety precautions.

Always unplug the unit before repairing any electrical part.

Always use the correct rated components when replacing defective ones.

Ensure that the reassembled parts are in the same state as when they were disassembled.

Remove any foreign material or dust from the power plug.

Replace the power cord if it is cracked or damaged.

Always carry the complete set of tools and equipment.

Ensure that the equipment is in good working condition.

Fig 19.1.1: Precautions while repairing refrigerator



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

20. Sealed System

Unit 20.1 - Seal System



ELE/N3113
ELE/N3115

Key Learning Outcomes

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

- Explain sealed system

UNIT 20.1: Seal System

Unit Objectives

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

- Explain sealed system

Notes for Facilitation

- Tell the participants that the term 'sealed system' refers to any system whose workings are concealed.
- Explain that a refrigerator sealed system is the cooling system where refrigeration occurs.
- Explain that it consists of the evaporator, condenser, compressor, suction tube and metering device.
- Explain that sealed system repair consists of following steps:

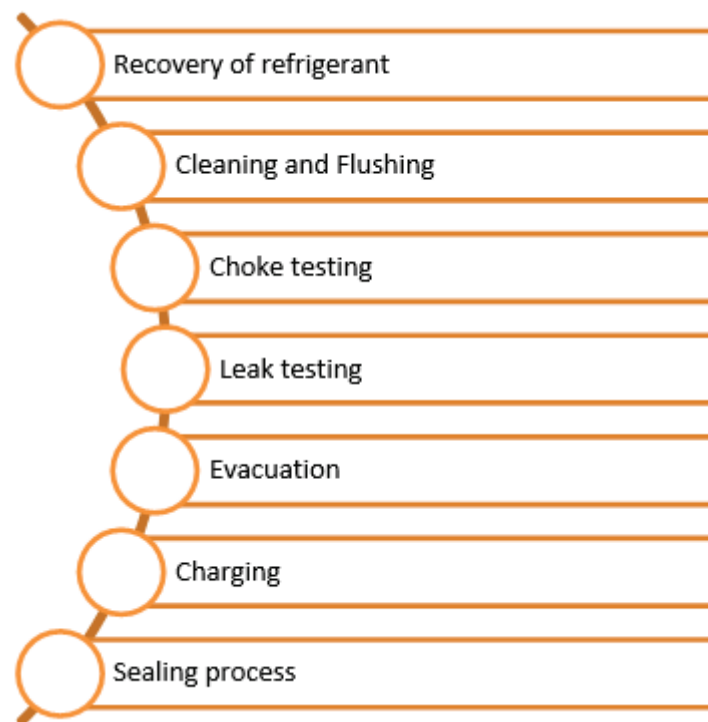


Fig 20.1.1: Steps of sealed system repair

- Explain that recovery of refrigerant implies removing a refrigerant from a refrigeration system and storing it in an external cylinder. This is done when the system needs to be repaired.
- Explain that they should take certain precautions while recovering refrigerants:
 - Always wear personal protective equipment.
 - Never recover a refrigerant near an open flame.
 - Always use a weighing scale to avoid overfilling the cylinders.

- Tell that the following tools and equipment are needed for recovering refrigerant:
 - PPE such as safety glasses, gloves and so on
 - Manifold gauges
 - Refrigerant recovery cylinder
 - Weighing scale
 - Suitable hoses
 - Refrigerant recovery unit
- Explain that there are three different methods of recovery:
 - Vapour recovery method
 - Liquid recovery method
 - Push-Pull method
- Explain that leak detection is a manual process carried out by a technician.
- Explain that when a leak is discovered, the entire system must be checked to identify possible source of leakage.
- Explain that following are the main methods of leak detection:
 - Using soap solution:

A soap solution is applied to joints, connections and fittings while the system is running. The soap bubbles help to identify leak points.
 - Using electronic refrigerant detector:

The electronic refrigerant detector contains an element sensitive to a particular chemical component in a refrigerant.
 - Using ultra-violet lamp:

Used in large systems where it is not possible to access all the joints and connections manually. An additive dye is added to the refrigerant. When the ultraviolet rays from the lamp fall on the leak, it glows in yellow-green colours.
- Explain that a refrigerating system should contain only liquid or vapour refrigerant and dry gas. All other fluids and gases must be removed.
- Tell that the following equipment is necessary to carry out evacuation:
 - vacuum pump
 - manifold gauges
 - servicing valves
 - vacuum gauge
- Explain that the system must always be evacuated when:
 - The system has no refrigerant
 - The refrigerant is contaminated
 - The lubricant is changed
 - Any circuit component such as compressor, evaporator and so on are removed
- Explain that charging a system means to add the proper quantity of refrigerant to the refrigeration system.

- Tell that a system can be charged by different ways such as:

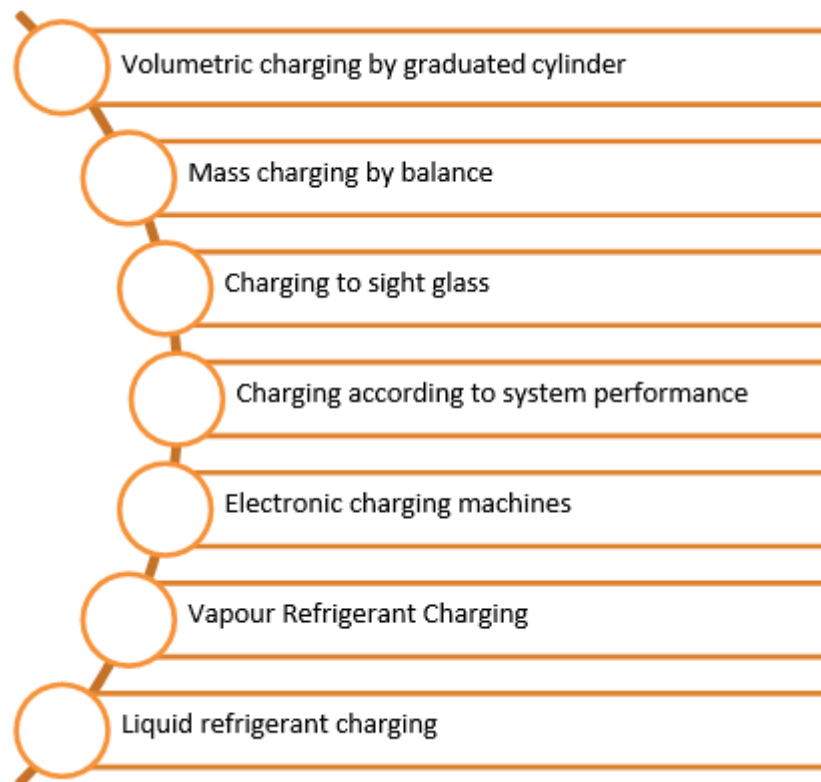


Fig 20.1.2 Ways of charging system



Skill India
कौशल भारत - कुशल भारत



Skilling India in Electronics

21. Washing Machine

Unit 21.1 - Basics of Hand Wash

Unit 21.2 - Types of Washing Machines

Unit 21.3 - To Compare Different Washing Machines

Unit 21.4 - Installation of WM



ELE/N3116
ELE/N3117

Key Learning Outcomes



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

- List steps, inputs of washing and elements required for hand wash
- Compare wash actions with machine wash
- Explain use of washing machine
- Compare different types of washing machines
- Install washing machine

UNIT 21.1: Basics of Hand Wash

Unit Objectives

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

- Explain the process of hand wash and compare with machine wash

Notes for Facilitation

- Explain the basics of hand wash process.
- Tell the participants that it is very important to follow certain dos and don'ts when washing clothes by hand:
 - Keep light and dark colour clothes separate
 - Ensure that water temperature is right
 - Do not over soak the clothes
- Explain that there are various advantages of using a washing machine as compared to washing clothes by hand such as:

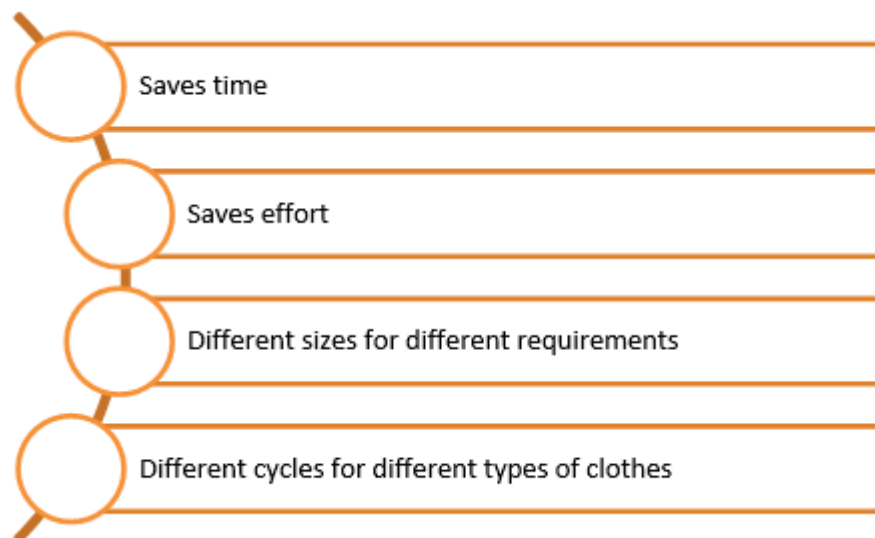


Fig 21.1.1: Advantages of using washing machine

UNIT 21.2: Types of Washing Machines

Unit Objectives

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

- Explain about different types of washing machines

Notes for Facilitation

- Explain that washing machines can be divided into two broad types:
 - Semi-automatic
 - Separate tubs for washer and dryer
 - Separate timers to set washing and drying times
 - Put clothes in washer, add water and detergent and set timer
 - After time is up, remove clothes and put in dryer
 - More labour intensive
 - Fully automatic
 - One tub that serves as washer, rinser and dryer
 - Automatically takes water and sets washing and drying time
 - Less labour intensive
- Tell the participants that depending on how clothes are loaded, washing machines can be of two types:
 - Top loading: Clothes are loaded from the top of the machine
 - Front loading: Clothes are loaded from the front side
- Explain that depending on the wash action, washing machines can be of four types:

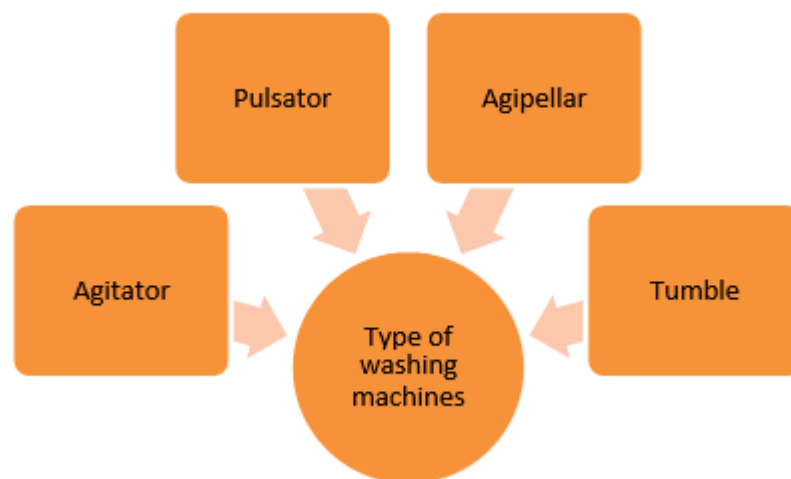


Fig 21.2.1: Type of washing machine

UNIT 21.3: To Compare Different Washing Machines

Unit Objectives

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

- Compare different washing machines

Notes for Facilitation

- Tell that the front loading and top loading washing machines are based on different types of wash actions. While the front-loading machines use tumble wash, the top loading machines use agitator, pulsator or agitellar wash actions.
- Explain the advantages of top loading machines:
 - Easier to put and take out clothes without bending
 - Shorter wash cycles
 - Minimal vibration
 - Simple control panel
 - More economical
- Explain the advantages of front loading machines:
 - Save space as they can be stacked
 - Can wash more clothes
 - Gentle on clothes
 - Use less water and detergent
 - More energy efficient
 - Offer higher spin speeds
 - Less wear and tear problems

UNIT 21.4: Installation of WM

Unit Objectives

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

- Explain installation of washing machine

Demonstrate

- The way to install washing machine

Notes for Facilitation

- Tell the participants that to ensure safe installation of the unit, a technician should:
 - Have all the required tools and equipment
 - Read the instruction manual carefully
 - Follow each instruction exactly as shown
 - Observe all electrical codes
- Explain that the technician should take following special precautions:
 - Ensure that the unit is not exposed to harsh weather conditions such as rain.
 - Ensure that the unit is properly grounded.
 - Ensure that the base opening is not blocked.
 - Ensure that the shipping bolts are removed.
 - Do not use an extension cord or a multi-socket adapter.
 - Ensure that the plug is easily accessible.
 - Ensure proper securing of drain hose.
 - Ensure that the inlet hose is not split or cross-threaded.
 - Do not insert wood pieces under the feet to level the unit.
 - Do not connect machine to a hot water supply.
 - Check for leaks after connecting the inlet hose.



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

22. Semi-Automatic Washing Machine

Unit 22.1 - Semi-Automatic Washing Machine (SAWM)



ELE/N3116
ELE/N3117

Key Learning Outcomes

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

- Explain the working of SAWM and practice its controls
- Identify different parts in SAWM and explain their working
- Read the wiring diagram of SAWM
- Disassemble the SAWM
- Test electronic/electromechanical components of SAWM
- Find the fault from the given symptom

UNIT 22.1: Semi-Automatic Washing Machine (SAWM)

Unit Objectives

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

- Explain working and controls of SAWM
- Explain the working of different parts in SAWM
- Explain the wiring diagram of SAWM
- Disassemble SAWM
- Test the electronic/electromechanical components of SAWM
- Explain fault finding procedure of SAWM

Demonstrate

- The function of various parts of a semi automatic washing machine
- The way to disassemble SAWM
- The way to test electronic/electromechanical components of SAWM

Notes for Facilitation

- Tell the participants that the working mechanism of a SAWM lies between that of hand washing and a fully automatic machine. It requires manual input at various stages of the wash cycle.
- Tell that SAWM are of two types:
 - Single-tub
 - Consist of a single tub for wash and spin
 - Have an outer layer and an inner layer
 - Inner layer has holes to enable water to drain out
 - Simpler to operate than twin-tub
 - Take up less space
 - Twin-tub
 - Consist of two tubs, one for washing and one for spinning
 - Clothes need to be manually shifted from the washer to the dryer
- Explain that a SAWM has the following advantages:
 - Water efficient
 - As water is added manually:
- The user can decide the exact quantity of water to add.

- The machine is not dependent on constant water supply to operate.
 - Energy saving
 - Consumes less energy than fully-automatic machines
 - Can stop and start the process at any time
 - Money saving
 - Less costly than fully-automatic machines
 - Adaptable
 - Can add clothes in between the wash cycle
 - In case of twin-tub, can wash second load while first is in dryer
 - Can reuse rinse water for another wash load
- Explain that a SAWM has the following disadvantages:
 - Time-consuming
 - Takes up more time
 - Is less convenient
 - Treatment of clothes
 - Can tangle clothes
 - Is rougher on fabrics
 - Electrical awareness
 - User needs to be careful when moving loads between the tubs
- Reiterate the dos and don'ts that should be kept in mind during testing of the electronic/electromechanical components of SAWM
- Explain in detail about the troubleshooting procedure that should be followed to find out and rectify any fault in a washing machine.



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

23. Top Loading Washing Machine

Unit 23.1 - Top Loading Washing Machine (TLWM)



ELE/N3116
ELE/N3117

Key Learning Outcomes

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

- Explain the working of TLWM and practice its controls
- Identify different parts in TLWM and explain their working
- Read the wiring diagram of TLWM
- Test electronic/electromechanical components of TLMM
- Find the fault from the given symptom

UNIT 23.1: Top Loading Washing Machine (TLWM)

Unit Objectives

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

- Explain working and controls of TLWM
- Explain the working of different parts in TLWM
- Explain the wiring diagram of TLWM
- Test the electronic/electromechanical components of TLWM
- Explain fault finding procedure of TLWM

Demonstrate

- The function of various parts of a top loading washing machine
- The way to test electronic/electromechanical components of TLWM

Notes for Facilitation

- Tell the participants there are two basic components of a washing machine:
 - The control system which consists of:
 - Control board
 - Load size selector (pressure switch)
 - Water temperature selector
 - Timer
 - Lid/locking switch
 - The mechanical system which consists of:
 - Motor
 - Transmission
 - Clutch
 - Inner and outer wash tubs
 - Agitator
 - Pumps
 - Water valve
 - Suspension system
 - Belt or motor coupling
- Explain the working of different components of the washing machine.
- Explain that there are two types of top loading washing machines:
 - Standard
 - Use a center agitator an impeller agitator to move clothes around

- High efficiency
 - Have a drum rotating around a horizontal axis
- To explain this concept, show a video using the following link:
 - <https://www.youtube.com/watch?v=cUvXDDJwca0>
- Reiterate the dos and don'ts that should be kept in mind during testing of the electronic/electromechanical components of TLWM
- Explain in detail about the troubleshooting procedure that should be followed to find out and rectify any fault in a washing machine.



Skill India
कौशल भारत - कुशल भारत



Skilling India in Electronics

24. Front Loading Washing Machine

Unit 24.1 - Front Loading Washing Machine (FLWM)



ELE/N3116
ELE/N3117

Key Learning Outcomes



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

- Explain the working of FLWM and practice its controls
- Identify different parts in FLWM and explain their working
- Read the wiring diagram of FLWM
- Disassemble and reassemble FLWM
- Find the fault from the given symptom and replace the faulty module

UNIT 24.1: Front Loading Washing Machine (FLWM)

Unit Objectives

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

- Explain working and controls of FLWM
- Explain the working of different parts in FLWM
- Explain the wiring diagram of FLWM
- Disassemble and reassemble FLWM
- Explain fault finding procedure of FLWM

Demonstrate

- The function of various parts of a front loading washing machine
- The way to read the wiring diagram
- The way to disassemble and reassemble FLWM

Notes for Facilitation

- Reiterate the concept of front loading washing machine.
- Ask the participants about the difference between top loading and front loading washing machines.
- State the main advantages of using front loading washing machine.
- Explain the key components of the machine one by one.
- Ask the participants to tell the full form of 'PCB'. If they are unable to answer then inform them that 'PCB' stands for Printed Circuit Boards.
- Explain the working of the main door of a FLWM.
- Explain the function and usage of each of the internal components.
- Explain the block diagram of the machine.
- Explain the installation process with the help of a demonstration.
- Reiterate the dos and don'ts that should be kept in mind during installation.
- To explain disassembly of a front loading washing machine, show a video using the following link:
 - https://www.youtube.com/watch?v=tZUHy_AOIYO
- Explain in detail about the troubleshooting procedure that should be followed to find out and rectify any fault in a washing machine.

Key Learning Outcomes

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

- Repair TLWM

UNIT 25.1: Repair Top Loading Washing Machine

Unit Objectives

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

- Repair TLWM

Demonstrate

- The way to repair TLWM

Notes for Facilitation

- Explain to the participants in detail about the troubleshooting procedure that should be followed to find out and rectify any fault in a TLWM washing machine.
- Reiterate that before going in for repairing or replacing any parts, the technician should do a visual inspection to see if the cause is something simple such as

Machine is not switched on.

The power socket has got short-circuited.

Machine is not plugged in.

The water supply is not there.

The circuit breaker has tripped.

The water inlet or outlet is blocked.

The drain hose is bent.

Fig 25.1.1: Causes for visual inspection

- To explain repair of top loading washing machine, show a video using the following link:
<https://www.youtube.com/watch?v=L916bBVGK3Q>



Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

26. E Waste

Unit 26.1 - E Waste – Electronic Waste

Unit 26.2 - Sources of E waste

Unit 26.3 - Components of E- Waste Management

Unit 26.4 - Do Recycle

Unit 26.5 - Don't Recycle



Key Learning Outcomes

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

- Explain the concept of E Waste

UNIT 26.1: E Waste – Electronic Waste

Unit Objectives

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

- Explain about E Waste

Notes for Facilitation

- Tell the participants that the term 'e-waste' stands for 'electronic waste' and is used to describe discarded electrical or electronic devices which have reached the end of their life and have become obsolete.
- Explain that examples of e-waste include old televisions, refrigerators, computers, cell phones and so on.
- Explain that the lifespan of devices and products is getting shorter as the consumer is demanding new things and discarding the old.
- Tell them that these obsolete devices are rapidly filling the landfills across the world, causing the toxic metals to reach into the groundwater.
- Explain that these electronic products contain materials such as cathode ray tubes (CRTs) that are hazardous and require special handling and disposal methods.
- Explain the adverse impact of various e-waste components on the environment with the help of the following figure:

Cathode ray tubes	<ul style="list-style-type: none"> • Lead and barium discharged into the ground and toxic phosphorous released in soil/air
Printed circuit boards	<ul style="list-style-type: none"> • Glass, dust, tin, lead and mercury discharged
Chips and gold plated components	<ul style="list-style-type: none"> • Tin, lead and heavy metals discharged
Plastics from keyboards, monitors	<ul style="list-style-type: none"> • Heavy metals and hydrocarbons discharged
Computer wires	<ul style="list-style-type: none"> • Polycyclic aromatic hydrocarbons (PAH) released into air, water and soil

Fig 26.1.1: Impact of e-waste

UNIT 26.2: Sources of E waste

Unit Objectives

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

- Explain sources of E Waste

Notes for Facilitation

- Tell the participants that there are numerous sources of e-waste as shown in the following figure:



Fig 26.2.1: Sources of e-waste

- Explain that the ratio of various sources of e-waste can be shown as in the following figure:

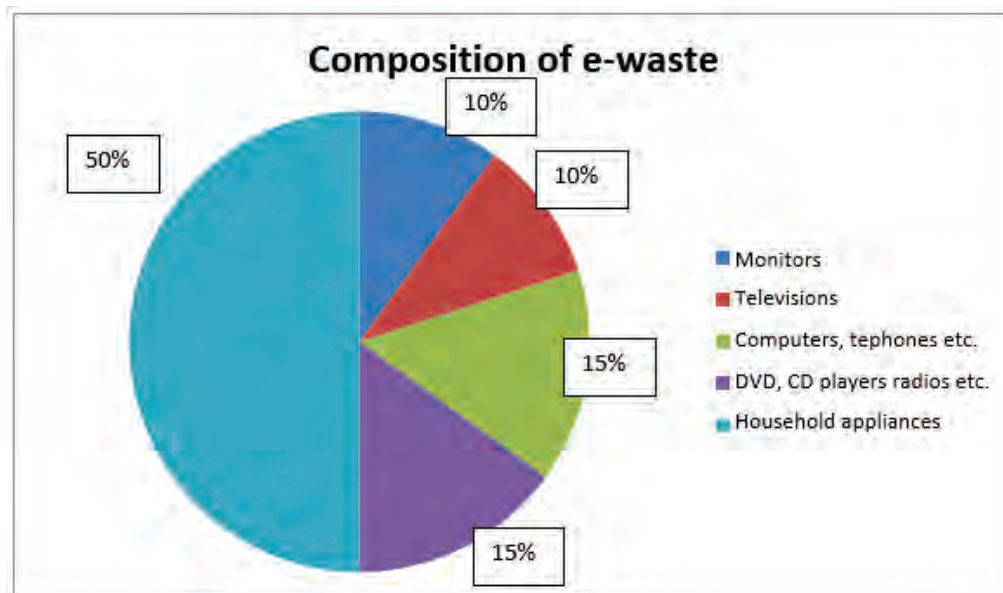


Fig 26.2.2 Composition of e-waste

- Explain that there are numerous sources of E Waste and each one of them has its own form of toxicity which is lethal for the environment and the health of human beings.

UNIT 26.3: Components of E- Waste Management

Unit Objectives

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

- Explain the Components of E- Waste Management

Notes for Facilitation

- Explain the need and importance of e-waste management.
- Tell the participants that the harmful consequences of e-waste have led to:
 - Polluting of ground water
 - Emission of toxic fumes and gasses
 - Acidifying of soil
 - Releasing carcinogenic substances into air
- Explain that the e-waste is disposed of using one of the following methods:
 - Open dumping: waste is disposed along shorelines into the seas
 - Land filling: waste is buried at a location
 - Incineration: waste is burned
- Explain that e-waste management should begin at the point of generation by minimizing waste.
- Explain that the following steps can help in e-waste management:

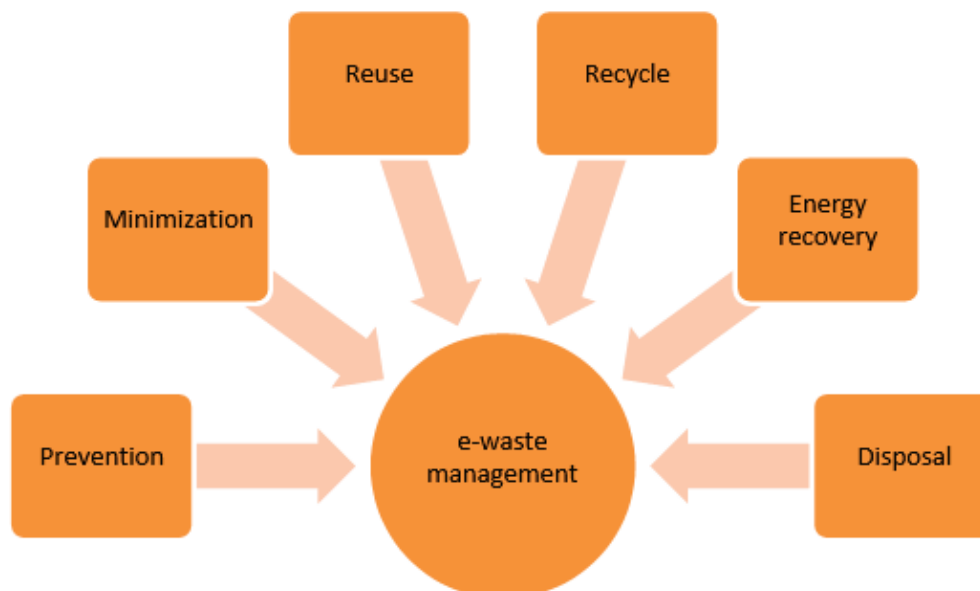


Fig 26.3.1: Steps in e-waste management

- Explain that e-waste management is a joint responsibility of:
 - Policy makers
 - Design a system of rules and regulations
 - Do research in hazardous waste management
 - Levy heavy fines on e-waste dumping
 - Establish system for collection and recycling of materials
 - Manufacturers
 - Adopt waste minimization processes
 - Choose bio-friendly packaging options
 - Label materials to help in recycling
 - Users
 - Choose products made of less toxic components
 - Use recycled products
 - Recycle used products

UNIT 26.4: Do Recycle

Unit Objectives

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

- Explain what can be recycled

Notes for Facilitation

- Tell the participants that the basic principles of e-waste management is:



Fig 26.4.1: Basic principles of e-waste management

- Reduce
 - Adopt measures that lead to decrease in the number of electronic and electrical equipment
 - Give an example that instead of buying a new product, the old product can be upgraded or repaired.
 - Further, tell them that, if possible they should always encourage the customer to get the old product repaired instead of encouraging him to buy the latest model.
- Reuse
 - If the equipment is in working order, increase the lifecycle of equipment by selling it or donating it.
- Recycle
 - After end of use, disassemble the equipment and recover the components to make new products.
 - Tell them that they should always advise the customer to recycle the old product to ensure that any usable material can be extracted from them.

- Tell them that they should practice following e-waste management steps:

The unwanted electronics should not be thrown along with normal garbage.

Used batteries and other e-waste should be collected, labelled and stored safely to be disposed off.

The manufacturer should be contacted to find out if they have a buy-back policy for discarded products.

Buy rechargeable batteries instead of disposable ones.

Always choose products with less hazardous substances, higher energy efficiency, and longer life span.

Choose products with good warranty and take back policies.

Fig 26.4.2 E-waste management steps

UNIT 26.5: Don't Recycle

Unit Objectives

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

- Explain what cannot be recycled

Notes for Facilitation

- Tell the participants that the users of electronic equipment should follow certain don'ts of e-waste recycling such as:

Don't dispose off electronic equipment if they are in working order.

Don't dismantle any electronic equipment to remove parts.

Don't try to repair any electronic equipment.

Don't keep any replaced spare part in an exposed area.

Don't leave hard drives in a computer while disposing it off.

Don't dispose off batteries by throwing them away.

Don't group alkaline batteries together for disposal.

Don't sell or give electronic equipment to local scrap dealers.

Fig 26.5.1: Dos and don'ts of e-waste recycling



Skill India
कौशल भारत - कुशल भारत



Skilling India in Electronics

27. So Skills

Unit 27.1 - Importance of So Skills and Self Introduction

Unit 27.2 - Self-Grooming

Unit 27.3 - Pre-Visit Phone Call

Unit 27.4 - Call Closure

Unit 27.5 - Inside Customer's Premises

Unit 27.6 - Quality Standards

Unit 27.7 - Interview Tips and FAQs

Unit 27.8 - Leadership



ELE/N3101
ELE/N9901

Key Learning Outcomes



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

- Explain the importance of soft skills in daily life and introduce yourself confidently in local language.
- Explain importance of self-grooming and list out dos and don'ts of grooming.
- Perform role play of pre visit phone call by following dos and don'ts
- Perform tasks in call closure
- List dos and don'ts at customer premises and perform role-play
- Explain quality standards
- Explain interview questions and answers

UNIT 27.1: Importance of Soft Skills and Self Introduction

Unit Objectives

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

- Explain soft skills
- Perform self-introduction

Activity

- Conduct role play to demonstrate the correct way of self-introduction.

Notes for Facilitation

- Tell the participants that there are two types of skills:
 - Hard skills
The technical skills and the ability to perform specific tasks
 - Soft skills
A combination of skills such as:



Fig 27.1.1: Type of skills

- Explain that communication is a two-way process and is said to be complete only when the receiver understands the message the sender is communicating.

- Tell the participants that communication includes
 - Verbal Communication
Consists of the spoken words, such as, you are talking to your team members or talking on phone with the customer.
 - Non-verbal communication
Consists mainly of gestures, facial expressions and movements.
 - Written communication
The written form of communication such as, reports, analysis and e-mails.
- Explain to the participants, the concept of team work and team building. Tell them that:
 - Teamwork is defined as coming together of people to achieve a common goal. In a team, all the members are important and might be dependent on each other for accomplishing tasks.
- Explain that social grace implies manners, enthusiasm, patience, friendliness and courtesy.
- Explain that business etiquette refers to being professional, honest, ethical, loyal, hardworking and responsible.
- Explain the importance of giving self-introduction in the right manner.
- Tell them that it enables you to make the customer feel at ease. Tell them that they should keep the following points in mind:

Have a pleasant appearance.

Smile and make eye contact with the other person.

Be confident in your greeting.

Begin by stating your name clearly.

Inform about the organization you belong to and your position.

Explain the purpose of your meeting/call.

Fig 27.1.2 Making customer at ease3

UNIT 27.2: Self-Grooming

Unit Objectives

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

- Explain self-grooming and its importance

Do

- Carry large printouts of a well-dressed man and an unkempt man.

Activity

- Show the following image to the participants and ask them what impression they get of the man in the picture:



Fig 27.2.1: Impression of man

- Next, show the following image to the participants and ask them what impression they get of the man in the picture:



Fig 27.2.2: Impression of man

Notes for Facilitation

- Discuss the impressions the participants got from the two pictures.
- Tell the participants that grooming is the process of making oneself look neat, clean and attractive.
- Explain that the external appearance gives the first impression to others and influences the opinion of others about you.
- Tell them that a well-dressed technician conveys the message of being confident, presentable, ambitious and sincere.
- Explain that some grooming dos and don'ts for men are:
 - Wear well fit clothes that are neither too tight nor too loose.
 - Always wear well-ironed clothes.
 - Wear simple formal shirts.
 - Avoid garishes, shiny tie pins or big belt buckles.
 - Wear a simple elegant watch and avoid flashy watches.
 - Keep hair neat and trimmed.
 - Keep nails short and trimmed.
 - Brush your teeth daily.

UNIT 27.3: Pre-Visit Phone Call

Unit Objectives

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

- Perform role play of pre visit phone call

Notes for Facilitation

- Tell the participants the importance of making a pre-visit phone call to a customer before visiting the premises.
- Explain that a pre-visit phone call:
 - Improves the customer's perception of the organization
 - Makes the customer feel valued
 - Gives him confidence that the company/organization cares about his problem/issue and is willing and capable of resolving it.
 - Enables a technician to obtain necessary information about the issue from the customer and prepare for it accordingly.
 - Demonstrates competence and professionalism
 - Gives the impression that the company respects the customer's time
 - Prevents a situation where the technician is not able to rectify the problem because he was not carrying the required part.
- Explain that to be effective, a pre-visit phone call must include:
 - Greeting the customer and self-introduction
 - Giving the name of the company
 - Confirming the name of the customer
 - Telling the purpose of the call
 - Confirming the location of customer's premises
 - Confirming the contact details of the customer
 - Confirming the time of visit
 - Informing about the duration of repair
 - Thanking the customer

UNIT 27.4: Call Closure

Unit Objectives

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

- Perform call wrapping

Notes for Facilitation

- Tell the participants that just as it is important to make a proper pre-visit call, it is also important to close a call properly.
- Explain that a technician should take the following call wrapping steps after he has resolved the customer's issue:

Clean the product and check its proper functioning.

Inform the customer that the problem has been rectified.

Give a demo of the product after service.

Ask the customer if they have any doubts or queries.

Ask the customer if there is any other product that needs servicing.

Give the customer care number for future references.

Provide the detailed description of bill and repair charges.

Thank the customer.

Fig 27.4.1: Steps for call wrapping

UNIT 27.5: Inside Customer's Premises

Unit Objectives

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

- Explain the dos and don'ts at customer's premises

Notes for Facilitation

- Emphasize the importance of maintaining a professional behaviour when visiting a client's premises.
- Explain the various points that a technician must keep in mind while entering a customer's premises.
- Conduct a role play activity to illustrate the significance of every point one by one.
- Ask two volunteers to play the roles of a technician and a customer.
- Tell the technician to enact an incorrect way of doing something, for example ask him to stand too close to the customer.
- Ask the customer how he felt when the technician was standing too close to him.
- Explain to the rest of the participants the correct distance to be maintained while interacting with a customer.
- In this way, ask different people to do small role plays to explain the dos and don'ts to the participants.

UNIT 27.6: Quality Standards

Unit Objectives

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

- Explain quality standards to be followed

Notes for Facilitation

- Tell the participants that there are certain quality standards that should be followed when visiting a customer's premises.
- Tell them that they are representing their company and the customer will judge the company by the way they behave.
- Explain that the technician should:

Be neat and tidy in appearance

Be pleasant and cheerful

Be knowledgeable about his job and do it well

Explain what he is doing to the customer

Avoid using bad language

Not gossip about other customers

Take care to protect the customer's property

Inform the customer before using any hazardous substance

Respect any instruction given by the customer

Fig 27.6.1: Quality standard for a technician

UNIT 27.7: Interview Tips and FAQs

Unit Objectives

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

- Explain interview tips and FAQs

Activity

- Conduct mock interviews with the participants one by one.

Notes for Facilitation

- Tell the participants that getting an interview call implies that the company thinks that they are the right person for the vacant position. So, they have already crossed the first barrier. They now need to convince the interviewer that they have the right knowledge, skill and experience for the job.
- Explain that to be successful in any interview, they must follow an interview preparation plan:
 - Find out about the organization
 - Visit company's website
 - Assess their products, services and client-base
 - Prepare questions to ask about the organization
 - Analyse the job requirements
 - Compare your skills to the requirement
 - Determine your position in the company hierarchy
 - Prepare response
 - Anticipate the obvious questions and your responses
 - Dress the part
 - Wear conservative business attire
 - Ensure that your clothes are neat and wrinkle-free
 - Ensure that the overall appearance is neat and clean
 - Carry the following things
 - Copies of resume
 - Pen and notepad
 - List of references
 - First impressions count
 - Arrive in time
 - Smile and establish eye contact
 - Mind your posture

- Be a en ve
- Sell your strengths
- Ask ques ons
- o Final stage
 - Thank the interviewer for his/her me

UNIT 27.8: Leadership

Unit Objectives

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

1. Explain leadership with the help of an activity

Notes for Facilitation

- Tell the participants that leadership can be defined as the ability of an individual to influence and guide other members of an organization.
- Explain that leadership involves:
 - Having a clear vision
 - Sharing the vision with others
 - Influencing others so they follow willingly
 - Providing knowledge, information and methods to achieve the vision
 - Coaching and building a team to achieve the vision.
- Tell that a good leader often has the following characteristics:



Fig 27.8.1: Leadership attributes

- Perform the leadership activity.



Skill India
कौशल भारत - कुशल भारत



Skilling India in Electronics

28. Employability & Entrepreneurship Skills

Unit 28.1 - Personal Strengths & Value Systems

Unit 28.2 - Digital Literacy: A Recap

Unit 28.3 - Money Matters

Unit 28.4 - Preparing for Employment & Self-Employment

Unit 28.5 - Understanding Entrepreneurship

Unit 28.6 - Preparing to be an Entrepreneur



Introduction: Employability and Entrepreneurship Skills

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

Icebreaker

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

Five of Anything Ice Breaker Steps:

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

Expectation Mapping

During the first session and after ice breaker session, ask the participants to answer the following questions: "What do I expect to learn from this training?"

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

Defining Objectives

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

In order to effectively facilitate this workshop:

1. You must have thorough knowledge of the material in the Participant Handbook, and be prepared to answer questions about it.
2. You may also wish to read other material to enhance your knowledge of the subject.
3. There may be issues raised with which you are not able to deal, either because of lack of time or knowledge.

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

4. You must have a very clear understanding of what the participants want to accomplish by the end of the workshop and the means to guide the participants.
5. As the facilitator, it is your responsibility to make sure that all logistical arrangements are made for the workshop. This may involve doing it yourself or confirming that someone else has made all necessary arrangements associated with the workshop. Assume nothing and check everything before the workshop begins.
6. To break the monotony and boredom during sessions, introduce mini breaks in the form of stretching exercises, jokes, some group songs or games.
7. Invite discussion from the participants.
8. Probe the participants further and lead them to come to affirmative conclusions.
9. Let the participants answer. No answer is incorrect.
10. Ask one participant to write all the points on the whiteboard.
11. Build the sessions from the answers provided by the class.
12. Prepare for the sessions in advance so that the resources like flipcharts, handouts, blank sheets of paper, marker pens, etc. can be kept ready.
13. Ensure that resources like board, markers, duster etc. is available before your session starts.

General instructions for role playing:

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

UNIT 28.1: Personal Strengths & Value Systems

Key Learning Outcomes

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

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

UNIT 28.1.1: Health, Habits, Hygiene: What is Health?

Unit Objectives

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

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

Resources to be Used

- Participant Handbook

Ask

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

Say

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

Ask

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

Say

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

Role Play

- Conduct a small skit with volunteers from the class. Consider one of the villagers has been appointed as a health representative of the village, what measures will you as a health representative suggest to the common villagers to prevent common health issues discussed.

- You will need at least 4 volunteers (Narrator, Health Representative, Head of the Village, Doctor).
- Explain the health concerns of the village to the Narrator. The Narrator will brief the class about the skit.
- Give the group of volunteers, 5 minutes to do discuss.
- At the end of 5 minutes, ask the group to present the skit to the class assuming them as the villagers.
- The class can ask questions to the group as a common villager.

Summarize

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

Say

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

Activity

- Health Standard Checklist from the Participant Handbook.

Ask

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

Say

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

Do

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

Summarize

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

Ask

Discuss:

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

Say

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

Activity

- Health Standard Checklist: Hygiene

Say

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

Do

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

Ask 

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

Summarize 

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

Ask 

- What is a habit?

Say 

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

Summarize 

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

UNIT 28.1.2: Safety

Unit Objectives

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

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

Resources to be Used

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

Say

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

Team Activity

Safety Hazards

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

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

Ask

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

Say

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

Do

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

Say

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

Do

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

Ask

De-briefing

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

Summarize

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

UNIT 28.1.3: Self-Analysis- Attitude, Achievement Motivation: What is Self-Analysis?

Unit Objectives

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

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

Resources to be Used

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

Activity

This is a paper pencil activity.

What are the three sentences that describe you the best?
--

What do you need to live happily?

What are your strengths and weaknesses?

Do

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

Say 

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

Team Activity 

Tower building

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

Do 

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

Ask 

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

Say 

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

Ask 

- Is your attitude positive or negative?

Say 

- Let me tell you a story:
It's Little Things that Make a Big Difference.

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

Ask

- What did you learn from this story?

Activity

What Motivates You?

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

Do

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

Say

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

Summarize

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

UNIT 28.1.4: Honesty & Work Ethics

Unit Objectives

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

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

Resources to be Used

- Participant Handbook

Ask

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

Say

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

Do

- Divide the class into four groups of maximum six participants depending on the batch size.
- Give one case study to each group.
- Instruct them to read the case carefully.

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

Team Activity

Case Study Analysis

Scenario 1

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

Scenario 2

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

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

Scenario 3

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

Scenario 4

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

Say 

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

Do 

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

Summarize 

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

UNIT 28.1.5: Creativity and Innovation

Unit Objectives

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

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

Resources to be Used

- Participant Handbook
- Chart papers
- Marker pens

Ask

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

Say

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

A.P.J. Abdul Kalam

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

Water filter/purifier at source

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

Inspiration behind the idea: Most people today prefer to use a water filter/purifier at their home. Both the children have given idea to have filter/purifier at the source of water so that everyone has access to clean water without having to make an investment in purchasing a filter/purifier.

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

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

Solar seeder

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

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

Looms for physically challenged

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

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

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

Ask

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

Say

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

Team Activity

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

Activity De-brief

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

Do

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

Summarize

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

Notes for Facilitation

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

UNIT 28.1.6: Time Management

Unit Objectives

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

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

Resources to be Used

- Participant Handbook

Ask

Does this sound like you?

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

Example

- Let's look at these two examples:

Example 1:

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

Example 2:

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

Ask

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

Activity

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

Say

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

Ask

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

Say

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

Activity

Effective Time Management

- This activity has two parts:

Part 1 To Do List

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

PART 2
URGENT-IMPORTANT GRID

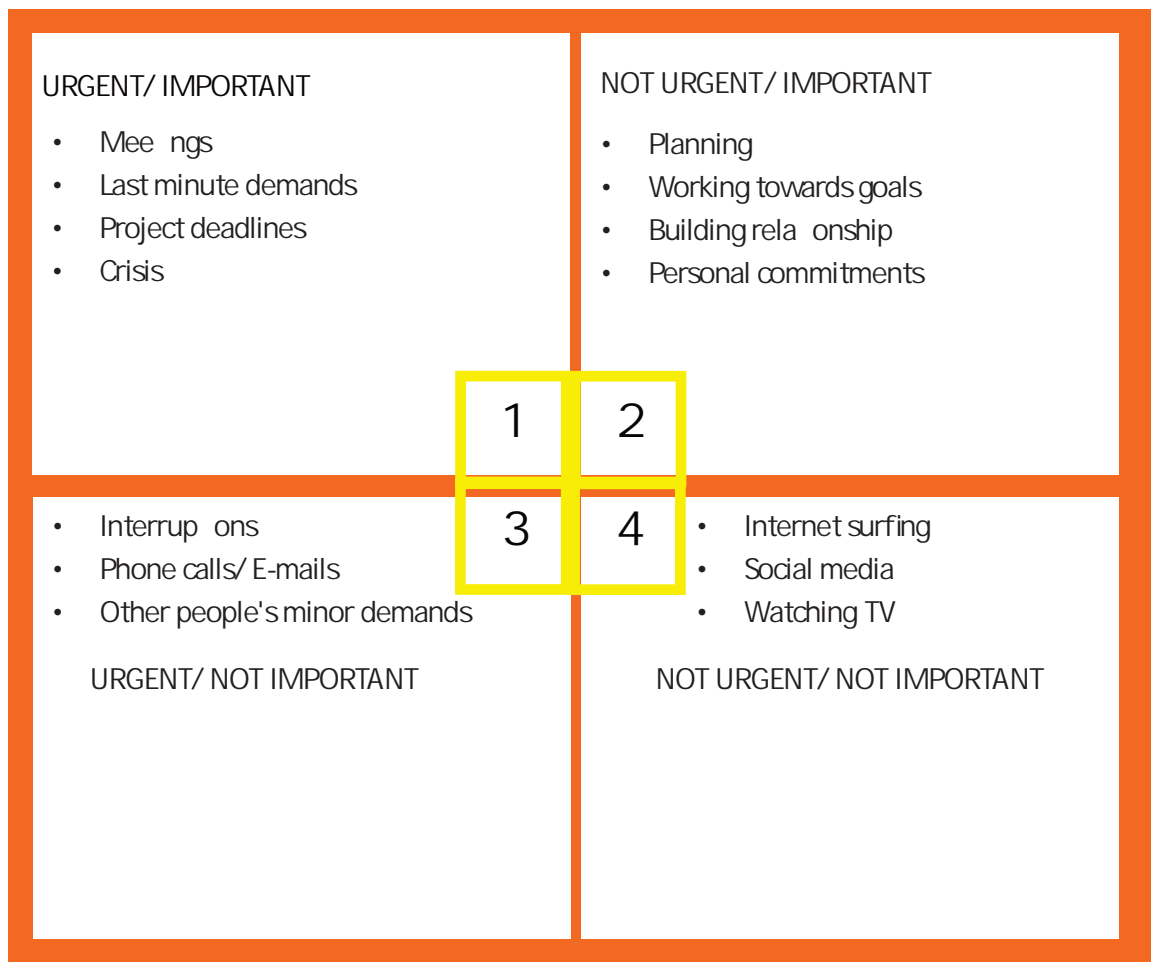
- You have to make a grid as shown on the board here.
- This grid has four boxes. As you can see, each box has a different heading.
- At the heart of the urgent-important grid, are these two questions:
 - Is this task important?
 - Is this task urgent?
- Now, you have to think about each activity that you have written in your to-do list and put it into one of the four categories.
- What do these categories depict?
- Category 1: Urgent/Important
 - This category is for the highest priority tasks. They need to get done now.
- Category 2: Not Urgent/Important
 - This is where you want to spend most of your time.
 - This category allows you to work on something important and have the time to do it properly.
 - This will help you produce high quality work in an efficient manner.
 - The tasks in this category are probably the most neglected ones, but also the most crucial ones for success.
 - The tasks in this category can include strategic thinking, deciding on goals or general direction and planning – all vital parts of running a successful business.
- Category 3: Urgent/Not Important
 - This is where you are busy but not productive. These tasks are often mistaken to be important, when they're most often busywork.
 - Urgent but not important tasks are things that prevent you from achieving your goals.
 - However, some may be activities that other people want you to do.
- Category 4: Not Important and Not Urgent
 - This category doesn't really include tasks, but rather habits that provide comfort, and a refuge from being disciplined and rigorous with your time management.
 - Some may be activities that other people want you to do.
 - These might include unplanned leisure activities as well.

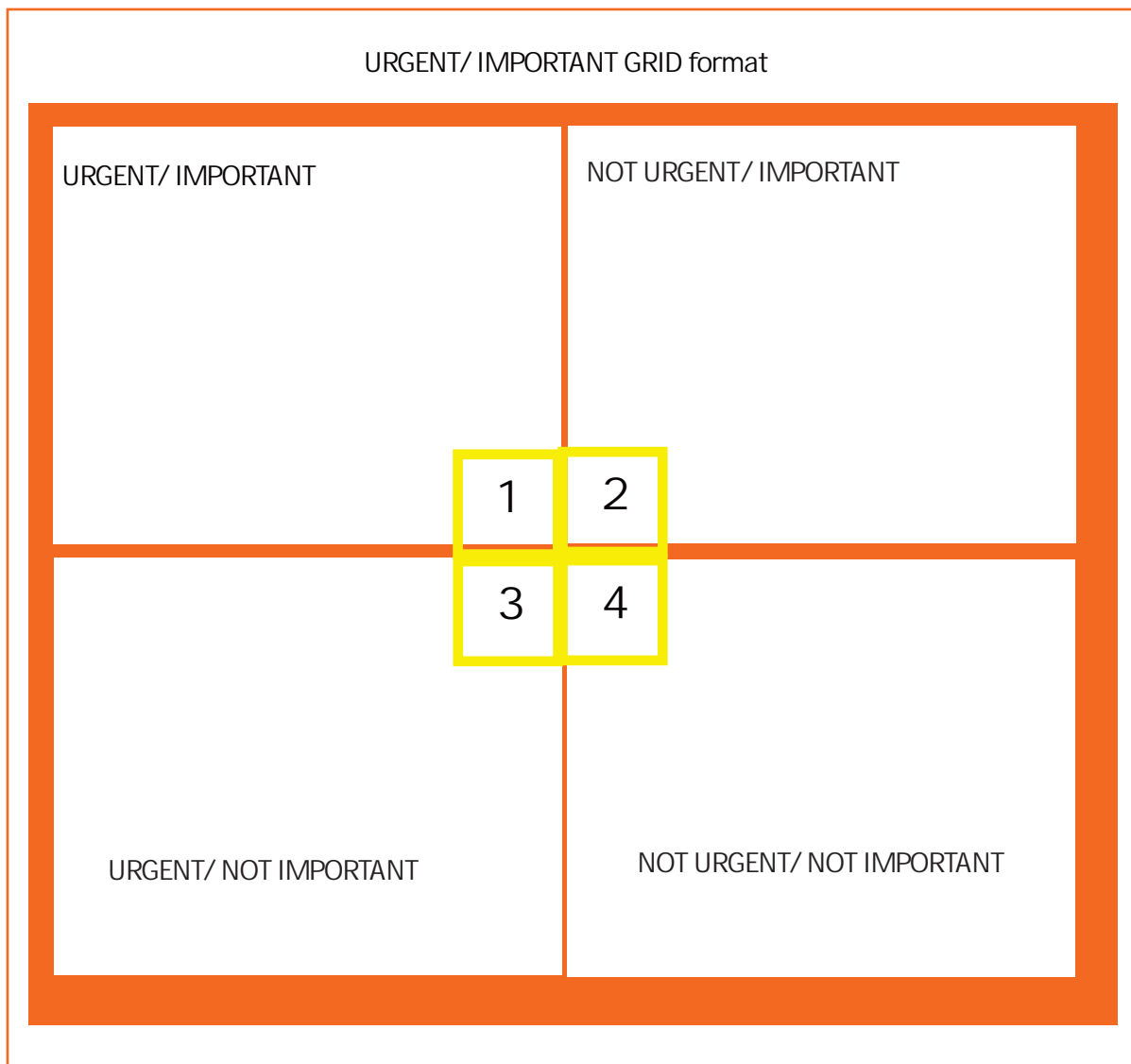
To – Do List Format

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

7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	

URGENT-IMPORTANT GRID





Do 

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

Say 

Activity De-brief:

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

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

Summarize

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

Notes for Facilitation

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

UNIT 28.1.7: Anger Management

Unit Objectives

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

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

Resources to be Used

- Participant Handbook

Ask

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

Say

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

Do

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

Activity

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

Ask

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

Say

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

Do

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

Activity

Trigger points and Anger Management Techniques Activity
 Anger Triggers

List of triggers that make you angry:

Someone says you did something wrong.

You want something you can't have now.

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

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

You are told that you can't do something.

Someone doesn't agree with you.

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

Someone unexpected happens that messes up your schedule.

Result of your anger:

Write the techniques that you use to manage your anger:

Anger Management Techniques

Say

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

Do

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

Ask

De-brief questions:

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

Summarize

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

Notes for Facilitation

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

UNIT 28.1.8: Stress Management: What is stress?

Unit Objectives

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

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

Resources to be Used

- Participant Handbook

Ask

- You are waiting in the reception for an interview or a very important meeting, suddenly your legs are shaky, your hands are cold, you are feeling nervous. Have you ever been in this kind of situation?
- Have you had days when you had trouble sleeping?
- Have you ever been so worried about something that you ended up with a terrible headache?

Say

- You've probably heard people say, "I'm really stressed out" or "This is making me totally stressed."

Ask

- What do you understand by stress?
- What gives you stress?
- How do you feel when you are stressed or what are the symptoms of stress?
- How can stress harm you?
- Why is it important for entrepreneurs to manage stress?

Say

- When we feel overloaded or unsure of our ability to deal with certain challenges, we feel stressed.
- Discuss about stress, causes of stress, and symptoms of stress as discussed in the Participant Handbook.

- Let's understand the causes of stress and how to deal with them with the help of some case scenarios.
- You will be given some cases.
- You have to analyse the case scenario and then find an appropriate solution to the problem.
- This will be a group activity.

Do

- Divide the class into four groups of 5-6 participants (depending on the batch size).
- Assign one case scenario to each group.
- Instruct them to read the case carefully.
- The group is expected to analyse and discuss the case amongst them and find a solution to the given problem.
- Explain their discussion should result in getting answers for the following questions:
 - What was/were the cause(s) of stress?
 - Was the stress avoidable or manageable under the given circumstances?
 - If yes, how do you think that the stress could be avoided (managed)?
 - If no, then why not?
- Give the class 10-12 minutes to discuss the case and note down their solutions.
- At the end of 12 minutes, the team should present their case solution to the larger group.
- Ask the group to select a group leader for their group.
- The group leader to discuss and assign roles to the group members for the presentation.

Team Activity

Case Study Analysis

Scenario 1

Akash's alarm doesn't go off and he gets late getting out of the house. He hits traffic and ends up 15 minutes late to work, which his boss notices. He gets to his desk and finds he has to complete 2 reports in next one hour. Just when he is about to begin work, a message pops up "Telecon with the client begins in 10 minutes. Please be in the conference room in 5 minutes." He is not prepared for the call. He is stressed. He does not want to speak to his boss about this. He is stressed, feeling uncomfortable and sick. Not in a position to attend the call or finish the reports on time.

Scenario 2

While paying his overdue bills, Rahul realised that it's the middle of the month and he has only Rs 500 left in his account. He has already asked all of his friends, and family for loans, which he hasn't paid back yet. He is still contemplating over the issue when his phone rings. His sister's birthday is due next week and she has seen a beautiful dress which she wants to buy but cannot tell the parents as it is a bit expensive. She wishes if Rahul could buy the dress for her. Rahul has promised to buy her the dress for her birthday.

Rahul is stressed, does not understand what to do. He is unable to concentrate on his work and unable to complete the tasks assigned. His team leader has already warned him of the delay.

Scenario 3

Sheela calls the cable company as she has unknown charges on her bill. She has to go through the automated voice mail menu three times and still can't get through to a customer care executive. After 15 minutes of repeated efforts, her call is answered. She explains the entire issue to the customer care executive but before the person could suggest a way out, the call drops.

Now Sheela has to call back and repeat the whole process all over again with a new customer care executive. She is very angry and calls again but cannot connect this time.

She has to leave to office so she decides to call from office and check. When she connects this time, she is angry and argues with the executive on the call. All her co-workers around are looking at her as her volume has suddenly increased. She bangs the phone and ends the call. Her co-worker Neelam enquires what has happened to her. She ignores her and just walks off. She has become irritable and her behaviour and tone with other co-workers is not acceptable.

Scenario 4

Arpit is a young entrepreneur who started doing business through Facebook few weeks back. He had always been into a job. Although Arpit has very few financial liabilities, it wasn't an easy decision to leave a comfortable job at once and look for newer pastures. Arpit's boss warned him of the consequences and the challenges of starting a business when nobody ever in his family had been in business.

He has not been able to get a good deal till now. This is an important life shift for him which comes with unknown variables. Arpit is nervous and is wondering if he has what it takes to fulfill the requirement of his new role, or the new experiences he's likely to face.

Ask

De-brief questions:

- What was/ were the cause(s) of stress?
- Was the stress avoidable or manageable under the given circumstances?
- If yes, how do you think that the stress could be avoided (managed)?
- If no, then why not?

Say

- Now, let's discuss the problem and solution with the larger group.
- The group will first briefly describe the case to the class.
- Then discuss the issue identified and the proposed solution.
- Post presentation, the other groups may ask questions to the group that has presented.

Do

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

Say

- While it is common and normal to feel some tension. This feeling nervous and tensed can interfere with your thinking process and can have a negative impact on your performance.
- Stress can deplete the most vibrant of souls. It can have a negative effect on every aspect of a person's life including their health, emotional well-being, relationships, and career. However, one needs to understand the causes and types of stress before looking for ways to manage it.

De-brief:

Scenario 1

The cause of stress was lack of time management and the habit of procrastinating. If Akash would have managed his time well, planned alternate ways to get up on time, finished prior tasks on time and planned for client meetings in advance then he wouldn't have faced stress.

Scenario 2

The cause of stress was lack of financial planning. Rahul should have planned his financial resources well in advance and saved some money for the rainy day. Also, differentiating between needs and wants and keeping a check on non-essential expenditure would have saved Rahul from this situation.

Scenario 3

Sometimes, stress is caused due to external factors instead of internal ones. In this case, the stress was unavoidable because we have no control over this customer care system. Every time, you will get in touch with a new executive and will have to explain all over again. This might cause stress but despite being frustrated and angry there is little that we can do about it. All Sheela could do was to find ways to calm herself down through some breathing exercises and meditation, reading some good book or listening to music and then start afresh.

Scenario 4

A positive, major life change can be a source of good stress. Regardless of how good the change is, it can be stressful. Stress caused by a positive and major life change can be beneficial because it causes a person to step out of their comfort zone and learn new skills. Here, Arpit may become a successful entrepreneur or learn new ways to do things differently. Now let us see this scenario, can I have a volunteer to read out this case to the class

Do



- Ask one of the participant who can volunteer and read out this scenario to the class.

Scenario 5

Rakesh lives in Kathmandu with his wife and two beautiful daughters Sarah and Sanya. Nepal was hit by a massive earthquake and Rakesh's building collapsed during the earthquake. During evacuation, Rakesh realised that though his wife and Sarah were fine and suffered only minor bruises, Sanya was nowhere in the scene. Panic stricken, he started calling her name and searching her frantically. A little later, he heard a meek voice from beneath the debris. He quickly removed the rubble to find a huge bed. Rakesh was pretty sure that Sanya was trapped underneath. Though he was badly bruised, he gathered all his courage and with all his might, he lifted the several-ton bed to save Sanya's life. Everyone was relieved to see Sanya alive and also extremely surprised to see this father's ability to access superhuman strength.

- Ask the audience to applaud for the participant after the scenario is read completely.
- Discuss the scenario, ask de-brief questions:
 - What kind of stress was Rakesh undergoing in this case?
 - Was the stress avoidable or manageable under the given circumstances?
 - What was the result of the stress?

Say

De-brief:

- Not all stress is harmful; good stress is actually energizing. This was a case of lifesaving stress, or hero stress, which is an important example of good stress. You may have heard stories in which a person performs an impossible feat of physical strength in order to save their life or the life of someone they love. This type of stress causing a surge of adrenaline is good for us.

Summarize

- Close the discussion by summarizing the tips to manage stress as given in the Participant Handbook.
- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

Notes for Facilitation

- Keep printed copies of the activities/ scenarios ready for the session.
- Put down the de-brief questions on a flip chart so that it can be displayed in the class during the activity.
- Encourage participation and make the discussions interactive.

UNIT 28.2: Digital Literacy: A Recap

Key Learning Outcomes

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

1. Identify the basic parts of a computer
2. Identify the basic parts of a keyboard
3. Recall basic computer terminology
4. Recall the functions of basic computer keys
5. Discuss the main applications of MS Office
6. Discuss the benefits of Microsoft Outlook
7. Identify different types of e-commerce
8. List the benefits of e-commerce for retailers and customers
9. Discuss Digital India campaign will help boost e-commerce in India
10. Describe how you will sell a product or service on an e-commerce platform

UNIT 28.2.1: Computer and Internet Basics: Basic Parts of a Computer

Unit Objectives

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

- Identify the basic parts of a computer
- Identify the basic parts of a keyboard
- Recall basic computer terminology
- Recall the functions of basic computer keys

Resources to be Used

- Participant Handbook
- Computer Systems with the required applications

Say

- Let's take a quick recap of the basic computer parts.
- Discuss 'Basic Parts of Computer' and 'Basic Parts of a Keyboard' with the class as given in the Participant Handbook.

Explain

- Explain all the parts of the computer and the keyboard by demonstrating on the real system.

Ask

- Do you know about internet?
- Have you ever used internet?
- Why do you think internet is useful?
- What was the last task you performed on internet?

Say

- Let's look at some basic internet terms.
- Discuss 'Basic Internet Terms' with the participants as given in the Participant Handbook.

Summarize

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

Practical

- Conduct a practical session.
- Ask the participants to assemble in the computer lab.
- Give some hands-on practice exercises.

Do

- Group the participants for the activity depending on the batch size and the number of computer systems available in the lab.
- Explain the purpose and duration of the activity.
- Ensure the participants complete the practical exercises assigned.

UNIT 28.2.2: MS Office and Email: About MS Office

Unit Objectives

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

- Discuss the main applications of MS Office
- Discuss the benefits of Microsoft Outlook

Resources to be Used

- Participant Handbook
- Computer Systems with the required applications

Ask

- What is the most frequent activity that you do on the computer?
- Do you know how to make presentations on the computer?

Say

- Give a brief introduction of MS Office as given in the Participant Handbook.
- Discuss the most popular office products. Explain in brief their application, benefits and working.
- Microsoft Word is a word processing program that allows for the creation of documents. The program is equipped with templates for quick formatting. There are also features that allow you to add graphics, tables, etc.
- Microsoft Excel is a tool for accounting and managing large sets of data. It can also simplify analysing data. It is also used to create charts based from data, and perform complex calculations. A Cell is an individual data box which will have a corresponding Column and Row heading. This gives the cell a name, referred to as the Cell Reference. There can be multiple pages in each workbook. Each page, or sheet, is called a Worksheet. When you open a new Excel file, it automatically starts you with three worksheets, but you can add more.

Explain

Explain the working and frequently used features of Office on a real system.

Ask

- What do you know about e-mails?
- Do you have an email id?
- How often do you check your e-mails?

Say

- Communication is vital for every business. The fastest and the safest way to communicate these days are through emails. MS Outlook helps to manage your emails in a better way and also offers a host of other benefits.
- Discuss “Why Choose Microsoft Outlook?” with the participants as given in the Participant Handbook.

Do

- Ask the participants to assemble in the computer lab.
- Explain the working of Outlook on a real system.

Demonstrate

- Demonstrate how to create email id.
- Demonstrate how to write new mails, send mails.
- Demonstrate how to use MS Office application to create a letter and send it as an attachment in an email.
- Demonstrate how to use other MS Office applications.

Practical

- Give some hands-on practice exercises
- Group the participants for the activity depending on the batch size and the number of computer systems available in the lab.
- Explain the purpose and duration of the activity.

Summarize

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have

UNIT 28.2.3: E-Commerce

Unit Objectives

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

- Identify different types of e-commerce
- List the benefits of e-commerce for retailers and customers
- Discuss Digital India campaign will help boost e-commerce in India
- Describe how you will sell a product or service on an e-commerce platform

Resources to be Used

- Computer Systems with internet connection
- Participant Handbook

Ask

- How many of you have done shopping online?
- Can you name at least five shopping websites?
- What is the product that you most frequently buy online?
- Why do you do shopping online instead of going to the market?

Say

- Give a brief introduction of "What is E-commerce". Refer to the Participant Handbook.
- E-commerce emerged in the early 1990s, and its use has increased at a rapid rate. Today, many companies sell their products online. Everything from food, clothes, entertainment, furniture and many other items can be purchased online.

Ask

- What other types of transactions have you performed on the internet other than buying products?

Say

- Give examples of e-commerce activities from Participant Handbook.

Team Activity

E-commerce examples

- Instruct the participants to list some of the payment gateways that they have used for e-commerce activities.
- Give them 5 minutes to make this list.
- Discuss payment gateways and transaction through payment gateways.
- Conclude the discussion by mentioning how important e-commerce has become in our day to day transactions.

Say

- E-commerce activities can be classified based on the types of participants in the transaction.
- Discuss “Types of E-commerce” from the Participant Handbook.

Do

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

Say

- E-commerce activities bring a host of benefits for both, retailers and customers.
- Discuss benefits of E-commerce from the Participant Handbook.

Explain

- The majority of the population that uses E-commerce activities lives in tier-1 and tier-2 cities. To encourage the use of digital money in tier-3 and 4 areas, PM Mr. Modi launched the “Digital India Campaign”.
- Discuss “Digital India Campaign” from the Participant Handbook.
- By Digital India project the government will deliver services via mobile connectivity and in doing so, is expected to bring the internet and broadband to remote corners of the country. This connectivity will in turn enhance e-commerce activities also. Furthermore, the Indian Government is also modernizing India Post and aims to develop it as a distribution channel for e-commerce related services.

Say

- Now let us discuss how to sell a product using E-commerce.
- Every product has to be sold on a platform on the internet. Think of it as a shop that you have to sell your product. Now this shop can be your own or shared or rented. If the shop is your own or rented there will be only your products in that shop. If the shop is shared, there will be products of multiple sellers in that shop. A common example is a departmental store which has products from multiple brands in the shop.
- Similarly, in E-commerce the shop is the website where your products are displayed. If it is your own website it will exclusively showcase your products. In this case the cost that you will incur will be:
 - Developing the website
 - Hosting the website
 - Maintenance of the website
- If you rent a website it will also showcase your own products but the development, hosting and maintenance parts go to the owner. This saves time and the cost to manage these activities.
- Smaller companies usually go for renting a website and the bigger ones develop their own website.
- The concept of shared platforms has become very popular in recent times. In this platform, the sellers have to register and then they can sell their goods on a common platform. Among the most popular of these are Amazon, Myntra, Flipkart, etc.

Role Play

- Tell the participants to choose a product or service that they want to sell online.
- Tell them to write a brief note explaining how they will use existing e-commerce platforms, or create a new e-commerce platform to sell their product or service.

Ask

- How much money are you carrying in your wallet?
- Do you have a credit/debit card?
- How do you make payments while doing online shopping?

Say

- Demonstration has made carrying cash in the wallet very difficult. People either shop through cards or some other form of digital money.
- So, what do you think is digital money?
- In this form, the money is both paid and received digitally. There is no hard cash involved. It is an instant and convenient way to make payments.
- There are various types of digital payments. Let us discuss some of them in brief here.
- The first one is the most commonly used system i.e. the cards. Debit card, credit card, prepaid card, all fall under this category.
- Then is the e-wallet or the mobile wallet. This has become the most used form of digital money after demonstration. Examples are Paytm, state bank buddy, Freecharge, etc.
- Many other forms of digital money are also coming up in market like mobile apps, Aadhar card-based payment, etc.

Do

- Demonstrate how to make and receive payments through digital models like Paytm and state bank buddy.

Ask

- Why do you think people have started using digital money instead of hard cash? Is demonstration the only reason?

Say

- Digital money gives a lot of advantages over the conventional hard cash. Some of them are:
 - Digital payments are easy and convenient. You do not need to take loads of cash with you, a mobile phone or a card will suffice.
 - With digital payment modes, you can pay from anywhere anytime.
 - Digital payments have less risk.

Summarize

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of e-commerce and digital money.

UNIT 28.3: Money Matters

Key Learning Outcomes

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

1. Discuss the importance of saving money
2. Discuss the benefits of saving money
3. Discuss the main types of bank accounts
4. Describe the process of opening a bank account
5. Differentiate between fixed and variable costs
6. Describe the main types of investment options
7. Describe the different types of insurance products
8. Describe the different types of taxes
9. Discuss the uses of online banking
10. Discuss the main types of electronic funds transfer

UNIT 28.3.1: Personal Finance – Why to Save?

Unit Objectives

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

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

Resources to be Used

- Participant Handbook

Ask

- How many of you save money?
- Why do you feel the need to save it?
- Do you plan your savings?
- Where do you keep the money you save?
- How do you use the money that you have saved?

Example

- Let's look at these two examples:

Example 1:

Suhani works in a good company and earns Rs. 30,000 month. She always saves 5000 per month and keeps it aside as a personal saving. She keeps the money at home and has saved quite a lot. One day her mother has a medical emergency and has to be taken to the hospital. Her family is worried about the amount they have to spend for the treatment. It will cost them atleast 40,000.

Suhani says tells her family not to worry and that she has about 50,000, which she has saved over the months.

Example 2:

Jasmeet works in the same company and earns the same as Suhani. She is very fond of shopping and spends most of her money on buying new clothes. At the end of the month, she is always asking her father for money as her pay is finished.

Ask

- Who do you identify with – Suhani or Jasmeet?
- How do you think Suhani manages to save money which Jasmeet is unable to do?

Say 

- We should always set aside some and save some money from our monthly pay. The future is unpredictable. Saving money not only gives you a sense of financial security but it can be used in case of emergencies.
- Discuss “Importance of Saving” with the participants as given in the Participant Handbook.

Ask 

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

Say 

- Discuss “Benefits of Saving” with the participants as given in the Participant Handbook.
- Now let us continue with Suhani's story. Suhani has told her family not to worry and that she has about 50,000, which she has saved over the months. The family is happy about Suhani's decision of saving money, which will be of great help for them now. Suhani is going to the hospital today to pay the first instalment for the treatment. Suddenly finds only 35,000 in her cash box when she counts and does not remember using it. She has not kept any record and now she is upset.

Ask 

- Was it a good decision by Suhani to save a part of her earnings every month?
- Was it a wise decision to keep all her savings as cash in a cash box?
- Could she have managed to save money in a better and more effective manner?
- Do you want to learn how to save money and use it effectively?

Say 

- Let's learn personal saving with the help of a group activity.

Team Activity

Personal Finance- Why to save

- This activity has two parts:

PART 1

WAYS TO SAVE MONEY

- You are earning 30,000/- per month. You have recently changed your job and have to move to a metropolitan city. You are now living as a paying guest paying 10,000/- per month. Your other estimated expenditures like travel, food, recreation would be around Rs. 17,000 per month.
- Make a list of different ways to save money.

PART 2

HOW WILL YOU USE THE MONEY?

- After a year how much have you been able to save?
- How will you use the money that you have saved?

Do

- Divide the class into groups of four.
- Instruct the participants to think and prepare a list of the various ways they can save money.
- Give the participants 10 minutes to prepare the list.
- Once done, instruct them to think of how they could use the money they have saved.
- Give the participants 10 minutes to prepare the list.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Activity De-brief

- What were the different ways you could save money?
- How much money were you able to save?
- How will you use the money you have saved in one year?

Say

- Discuss the importance of personal finance and why it is important to save money.

Summarize

You can summarize the session by discussing:

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

UNIT 28.3.2: Types of Bank Accounts, Opening a Bank Account

Unit Objectives

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

- Discuss the main types of bank accounts
- Describe the process of opening a bank account

Resources to be Used

- Account opening sample forms
- Participant Handbook

Ask

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

Example

- Let's look at the given example:

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

To save time, she decides to buy a second hand scooter for herself. But she has to save money for it. Her class mate advises her to open a recurring deposit account in the bank. She goes to the bank close to her home. The personal manager gives her some forms to fill. She is confused as she has never done this before. Her elder sister has an account in the same bank. She asks for help from her sister. She goes to the bank the next day with her sister. The personal banker gives her a list of documents that she will need to submit with the form for opening an account. The banker advises her to open a 6 months recurring deposit.

Ask

- Do you try to save money monthly but have to spend it on unforeseen expenditure?
- Have you ever thought of depositing your savings in a bank?

Say 

- Before opening a bank account, you need to know the types of accounts we have in India.
- Discuss “Types of Bank Accounts” with the participants as given in the Participant Handbook.

Ask 

- Can someone say what are the different types of bank accounts?

Say 

- Let's learn about the different types of bank accounts through an activity.

Team Activity 

- Divide the class in four groups.
- Label the groups as savings account, current account, recurring account and fixed deposit.
- On a chart paper, ask them to write the key points of their account.

Activity De-brief

- Ask each group to present the key points of their account.

Say 

- Now that you know about the four different types of accounts, let's learn how to open a bank account.
- Discuss “Opening a Bank Account” with the participants as given in the Participant Handbook.
- Discuss “Tips” that the participants should keep in mind while opening a bank account as given in the Participant Handbook.

Ask 

- What are the main documents required for opening a bank account?
- What are some important points to ask the bank personnel while opening an account?

Say

- Mention officially valid KYC documents (refer to the Participant Handbook)
- Now, let's understand the procedure of opening a bank account through an activity.

Team Activity

Opening a Bank Account

- This activity is done in groups.
- Divide the class in groups of four or six

PART 1

FILLING A BANK ACCOUNT OPENING FORM

- You have to fill a bank opening form.
- You can refer to the section "Opening a Bank Account" of your Handbook for reference.
- List all the steps that you will be required to fill in the form.
- List the documents that you need for filling the form.
- Now fill in the form.

Activity De-brief

How did you design the form?

- What all details did you fill in the form?
- What were your KYC documents?
- How would this activity help you in future?

Do

- Instruct the participants to read the section "Opening a Bank Account" of the Participant Handbook.
- Give each group one sample account opening form.
- Give the participants 5 minutes to read the form.
- Give them 15 minutes to fill it.
- Assist them by explaining each category and how to fill it.
- Keep a check on time.
- Tell the group to wind up quickly if they go beyond the given time limit

Summarize

Note:

- You can summarize the unit through a role play.
 - A person wanting to open an account in the bank.
 - What is the procedure that he will go through?
 - Discuss the key points of different types of bank accounts.
 - How to select the type of account
 - How to fill the account opening form.
- A sample account opening form is given in the following page for reference. Use it for the activity in the class.

Sample Bank Account Opening form.

XXX Bank

Photograph

SAVING BANK ACCOUNT OPENING FORM

Account No.: _____ Date: _____

Name of the Branch			
Village/Town			
Sub District / Block			
District			
State			
SSA Code / Ward No.			
Village Code / Town Code		Name of Village / Town	

Applicant Details:

Full Name	Mr./Mrs./Ms.	First	Middle	Last Name
Marital Status				
Name of Spouse/Father				
Address				
Pin Code				
Tel No. Mobile		Date of Birth		
Aadhaar No.		Pan No.		
MNREGA Job Card No.				
Occupation/Profession				
Annual Income				
No. of Dependents				

Detail of Assets	Owning House : Y/N	Owning Farm :		
	No. of Animals :	Any other :		
Existing Bank A/c. of family members / household	Y / N	If yes, No. of A/cs. _____		
Kisan Credit Card	Whether Eligible	Y / N		
I request you to issue me a Rupay Card .				
I also understand that I am eligible for an Overdraft after satisfactory operation of my account after 6 months of opening my account for meeting my emergency/ family needs subject to the condition that only one member from the household will be eligible for overdraft facility. I shall abide by the terms and conditions stipulated by the Bank in this regard.				
Declaration:				
I hereby apply for opening of a Bank Account. I declare that the information provided by me in this application form is true and correct. The terms and conditions applicable have been read over and explained to me and have understood the same. I shall abide by all the terms and conditions as may be in force from time to time. I declare that I have not availed any Overdraft or Credit facility from any other bank.				
Place:		Signature / LTI of Applicant		
Date:				
Nomination:				
I want to nominate as under				
Name of Nominee	Relationship	Age	Date of Birth in case of minor	Person authorised in case to receive the amount of deposit on behalf of the nominee in the event of my /minor(s) death.
Place:		Signature / LTI of Applicant		
Date:				
Witness(es)*				
1. _____				
2. _____				
*Witness is requires only for thumb impression and not for signature				

UNIT 28.3.3: Costs: Fixed vs. Variables: What are Fixed and Variable Costs?

Unit Objectives

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

- Differentiate between fixed and variable costs

Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

Ask

- What is cost?
- Will a telephone bill fall under the category of a fixed or variable cost?

Say

- Discuss Fixed and Variable cost with examples. Let us do a small activity.

Team Activity

Identify the type of cost

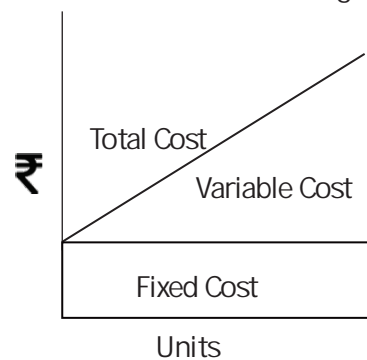
1. Rent
2. Telephone bill
3. Electricity bill
4. Machinery
5. Insurance
6. Office supplies/Raw materials
7. Employee salaries
8. Commission percentage given to salesperson for every unit sold
9. Credit card fees
10. Vendor bills

Do 

- Divide the class into two groups. Read out the list of costs given in the activity.
- Read out each item from the cost list and ask the groups in turns to identify whether it is a fixed or variable cost.

Say 

- We saw that your utility bills like rent, electricity, telephone etc. are all fixed costs because you have to pay it every month.
- Variable costs is an expense which varies with production output or volume. For example, commission, raw material etc.
- Discuss “Cost: Fixed vs. variables” with the participants as given in the Participant Handbook.
- Illustrate the relation between the costs with a graph.



- Let's learn the difference between fixed and variable cost with the help of an activity.

Team Activity 

Fixed vs. Variable Costs

- This is a group activity.
- You want to start your own entrepreneur business.
- State the type of business you want to start.
- List down all the cost or requirements for your business.
- How will you differentiate between the fixed and variable cost.

Activity De-brief

- What is the total cost of your business?
- What are the fixed costs?
- What are the variable costs?
- How did you differentiate between the fixed and variable costs?

Do 

- Instruct the participants that this is group work.
- Divide the class into small groups of 4 or 6.
- Give each group a sheet of paper.
- Tell the participants that they have to start their own entrepreneur business.
- Ask them the type of business they want to start.
- Instruct them to differentiate between the fixed and the variable costs of the business they want to start.
- Give the participants 15 minutes to discuss and write.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Summarize 

- Note: You can summarize the unit either by having a role play between a consultant and a budding entrepreneur explaining the differences between fixed and variable costs or by discussing the key points of the unit.

Notes for Facilitation 

- Answers for the activity - Identify the type of cost
- | | |
|--|------------|
| 1. Rent | (Fixed) |
| 2. Telephone bill | (Fixed) |
| 3. Electricity bill | (Fixed) |
| 4. Machinery | (Fixed) |
| 5. Insurance | (Fixed) |
| 6. Office supplies/ Raw materials | (Variable) |
| 7. Employee salaries | (Fixed) |
| 8. Commission percentage given to sales person for every unit sold | (Variable) |
| 9. Credit card fees | (Variable) |
| 10. Vendor bills | (Variable) |

UNIT 28.3.4: Investments, Insurance and Taxes

Unit Objectives

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

- Describe the main types of investment options
- Describe the different types of insurance products
- Describe the different types of taxes

Resources to be Used

- Participant Handbook

Ask

- Ask the participants- "What do you see first thing in when you get your mobile bill? Apart from the amount and due date do you have a look at the taxes you are being billed for?"
- Why do you think people get their cars insured or have a medical insurance?
- You have saved money and want to invest it; how would you decide what is the best investment for your money?

Example

- Let's have a look at a few scenarios

Ranbir has sold his house and deposited the money in his bank. His Chartered Accountant tells him that he will have to re-invest the money otherwise he will have to pay capital tax. What is capital tax and how is it different from income tax?

Jasmeet and Anup are blessed with a baby girl. They decide to have an insurance policy that will mature when their daughter is ready to higher education.

Shivani is working in a corporate office and getting good pay. She will have to pay income tax so she decides to invest her money in tax saving schemes. She goes to the bank manager to discuss the best products in which she can invest.

Say

- Discuss the Investment, Insurance and Taxes as given in the Participant Handbook.

Ask 

- How do investments, insurances and taxes differ from each other?

Say 

- Let's learn the differences between the three by having an activity.

Say 

- We will have a quiz today.

Team Activity 

- The activity is a quiz.

Do 

- Divide the class into groups of three and give a name to each group
- Explain the rules of the quiz. For each correct answer, the group gets 1 mark. If the group is unable to answer the question is rolled over to the next group.
- Explain the purpose and duration of the activity.
- On the blackboard write the names of the groups.
- Ask the questions of the quiz.
- Keep a score for the groups.
- Set guidelines pertaining to discipline and expected tasks.

Summarize 

- Summarize the unit by discussing the key points and answering questions

Notes for Facilitation 

Questions for the quiz

1. Mr. Das gets monthly return on one of his insurance policies. Name the policy?
Money Back Life Insurance
2. What are bonds?
Bonds are instruments used by public and private companies to raise large sums of money.
3. Who issues the bonds?
Private and public companies issue the bonds

4. Why are bonds issued?
To raise large amount of money as it cannot be borrowed from the bank.
5. Who is the buyer of stocks and equities?
The general public is the buyer.
6. What types of scheme is the Sukanya Samriddhi Scheme?
Small Saving Scheme
7. What is the difference between mutual and hedge funds?
Mutual funds are professionally managed financial instruments that invest the money in different securities on behalf of investors. Hedge funds invest in both financial derivatives and/or publicly traded securities.
8. Why is a loan taken from the bank to purchase real estate?
To lease or sell to make profit on appreciated property price.
9. Name the two types of insurances?
Life Insurance and Non-life or general insurance
10. Which insurance product offers financial protection for 15-20 years?
Term Insurance
11. What is the benefit of taking an endowment policy?
It offers the dual benefit of investment and insurance.
12. What are the two benefits of a Whole Life Insurance?
It offers the dual benefit of investment and insurance
13. Which policy covers loss or damage of goods during transit?
Marine Insurance
14. After what duration is the income tax levied?
One financial year
15. What is long term capital gain tax?
It is the tax payable for investments held for more than 36 months.
16. Name the tax that is added while buying shares?
Securities Transaction Tax
17. What is the source of corporate tax?
The revenue earned by a company.
18. Name the tax whose amount is decided by the state?
VAT or Value Added Tax
19. You have bought a T.V. What tax will you pay?
Sales Tax
20. What is the difference between custom duty and OCTROI?
Custom duty is the charges payable when importing or purchasing goods from another country. OCTROI is levied on goods that cross borders within India.

UNIT 28.3.5: Online Banking, NEFT, RTGS, etc.

Unit Objectives

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

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

Resources to be Used

- Participant Handbook
- Computer System with internet connection
- Debit card

Ask

- When was the last time you visited a bank?
- How do you pay your bill for electricity and telephone?
- Have you ever tried to transfer money from one bank account to another bank account using the online banking facility?

Say

- Most of us lead a busy life. Time has become more important than money. In this busy schedule, no one has time to stand in bank queues. That's where Online Banking comes in. Online banking or internet banking means accessing your bank account and carrying out financial transactions through the internet.
- Discuss "What is online banking?" from the Participant Handbook.
- There are various advantages of online banking:
 - It saves time, as you need to visit the branch.
 - You can conduct your banking transactions safely and securely without leaving the comfort of your home.
 - Online Banking also gives you round the clock access.
 - Online Banking makes it possible for you to pay your bills electronically.

Do 

- Show them how they can use the internet banking.
- Use the computer system and show the demo videos on how to use internet banking provided on most banking sites. the computer system.
- Tell the class the various features of online banking:
 - Through their website set-up your online account.
 - Choose a secure username and password.
 - Set-up your contact information.
 - Once your information is verified, you are good to go.
 - Once you enter the portal explore all the features and learn your way through the portal.

Say 

- One of the biggest advantage that online banking offers, as discussed earlier, is transferring money from one account to another. This transaction is called electronic funds transfer. Electronic transfers are processed immediately with the transferred amount being deducted from one account and credited to the other in real time, thus saving time and effort involved in physically transferring a sum of money.
- Discuss “Electronic Funds Transfer” from the Participant Handbook.

Do 

- Discuss how to transfer money from one account to another using online banking (NEFT/RTGS, etc.).
- Illustrate with an example.

Summarize 

- Close the discussion by summarizing the about online banking.
- Ask the participants if they have any questions related to what they have talked about so far.

UNIT 28.4: Preparing for Employment & Self-Employment

Key Learning Outcomes



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

1. Discuss the steps to follow to prepare for an interview
2. Discuss the steps to create an effective Resume
3. Discuss the most frequently asked interview questions
4. Discuss how to answer the most frequently asked interview questions
5. Identify basic workplace terminology

UNIT 28.4.1: Interview Preparation: How to Prepare for an Interview?

Unit Objectives

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

- Discuss the steps to follow to prepare for an interview

Resources to be Used

- Participant Handbook

Ask

- Have you ever attended an interview?
- How did you prepare before going for an interview?

Say

- An interview is a conversation between two or more people (the interviewer(s) and interviewee) where questions are asked by the interviewer to obtain information from the interviewee.
- It provides the employer with an opportunity to gather sufficient information about a candidate and help them select the ideal candidate.
- It also provides the interviewee with an opportunity to present their true potential to the employer, build confidence and help make a decision about the job by asking questions regarding designation, salary, perks, benefits, promotions, transfers, etc.
- Let's do an activity to understand how to prepare for interviews better.

Activity 1

- Introducing Yourself

Do

- Select a participant and ask him/her to answer the following questions: "What can you tell me about yourself?"
- Give the participant at least one minute to speak.
- Once he/she is done, ask the rest of the participant what they gathered about the participant who was providing information.
- Now repeat the exercise with five other participants.

Ask

- What information you should include when you are describing or introducing yourself in an interview?
- What information you should not include when you are describing or introducing yourself in an interview?

Say

- Tell the participants that when an interviewer asks you to say something about yourself, he/she is not asking you to present your life history.
- Introduction should be short and crisp, and should present you in a positive light. It should include the following points:
 - Any work experience that you might have
 - A brief summary of your educational qualifications
 - Your strengths and achievements
 - Any special projects that you might have been part of
- The following topics should be avoided during an introduction:
 - Detailed description of your family (unless you are specifically asked to do so)
 - Too much information about your weaknesses
 - Information that is not true

Do

- Congratulate each participant for sharing their points.
- Ask the audience to applaud for them.
- Ask de-brief questions to cull out the information from each group.
- Keep a check on time.

Activity 2

- Planning the right attire

Do

- Describe 2 individuals to the participants. One is wearing a casual t-shirt, jeans, and slippers. He has not combed his hair and neither has he trimmed or shaved his beard. The other individual is dressed formally with a shirt and pants, and is well-groomed. He has also worn formal shoes and a belt. Ask the participants which person would they prefer to hire in their organization and why?

Summarize

- Close the discussion by discussing 'how to prepare for an interview' as discussed in the Participant Handbook.
- You can add the following points to it:
 - Tell the participants to create a positive and good impression in an interview. It is important for them to prepare for an interview beforehand.
 - The interviewer analyses not only your technical knowledge in relation to the job, but also whether or not you are a fit for the organization.
 - Every employer looks at the whole package and not just one or two things in isolation. Therefore, the way you dress and the way you present yourself is also important along with your skills and talents.
 - The participants will get only one chance to create a good first impression.

UNIT 28.4.2: Preparing an Effective Resume: How to Create an Effective Resume?

Unit Objectives

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

- Discuss the steps to create an effective Resume

Resources to be Used

- Participant Handbook
- Blank Papers
- Pens

Ask

- When preparing for an interview, what are the most important things that you need to do?
- What documents do you carry with you, when you go for an interview?
- What is a resume?
- Why do you need a resume?

Say

- Resume is not just a sheet of paper with your qualifications printed on it.
- It is a selling tool that will help the employer to see how and what you can contribute for company.
- Talk about the steps involved in creating an effective/a attractive resume discussed in the Participant Handbook.
- Now let's prepare a resume to understand the process in a better way.

Do

- This is an individual activity.
- Give the details of the activity.
- Instruct them to read the activity carefully.
- The participant is expected to make an attractive resume based on the information provided.
- Give the class 25-30 minutes to study the case and create a resume.
- At the end of 30 minutes, the participants should exchange the resume with the person sitting next to him or her.
- Every participant will evaluate the resume prepared with their fellow participants.

Say

- Do you think the candidate should apply for the job position described in the advertisement?
- We have already discussed the steps involved in creating an effective/ attractive resume.
- Now let's prepare a resume for the candidate details given in the activity.

Activity

Case Study Analysis

- In the first section of the activity, you are being given the information about a candidate who is applying for a particular job.
- In the second section, you are being given the detailed description of the job position. Create a resume for the candidate to apply for the job position.
- Use the information that has been provided about the candidate to create this resume.

Candidate Details

Nipesh Singla was born on 20th April, 1988 in Chandigarh, India. He currently resides at 1XX7, Sector XX D, Chandigarh – 160018. His mobile number is 988XXXXX01, and e-mail address is nxxxxxxxxla@gmail.com. Nipesh attended middle and senior school at Government Boys Senior Secondary School, Sector 15, Chandigarh. He has been a very talented boy since school. He was fond of painting and watching old Hindi movies. As part of a school charity program, he volunteered at the children's hospital during his senior years.

In July 2007, he joined Westwood School of Hotel Management, Zirakpur to pursue a diploma course in Hotel Management and Catering. After completing this course, he joined XYZ Group of Hotels as a Housekeeping intern in June 2010 for six months. In this role, he was responsible for cleanliness and maintenance of one floor in the hotel. Taking advantage of his strong interpersonal skills, he also got opportunities to make housekeeping arrangements for corporate meetings. While pursuing education, he gained working knowledge of Microsoft Word, Excel, Access and PowerPoint.

Nipesh is detail-oriented, flexible and adaptable. He has successfully worked with a diverse work force. He gelled well with his peers, both in college and during his internship. After completing the internship, his objective has been to find a job opportunity where he can use his skills and experience. Backed by experience, he is confident about his skills as a housekeeping assistant.

Job Posting

*Do you see yourself as a HOUSEKEEPING SUPERVISOR?

What's your passion? Whether you're into cricket, reading or hiking, at IHG we are interested in YOU. At IHG, we employ people who apply the same amount of care and passion to their jobs as they do in their hobbies people who put our guests at the heart of everything they do. And we're looking for more people like this to join our friendly and professional team.

THE LOCATION:

At the moment, we are looking for HOUSEKEEPING SUPERVISOR to join our youthful and dynamic team at Holiday Inn Amritsar, Ranjit Avenue in Amritsar, Punjab (India). Holiday Inn Amritsar is ideally located in Amritsar's commercial district on Ranjit Avenue with the world famous Golden Temple located only a short distance away. Sparkling chandeliers mark an incomparable arrival experience as you escape to the welcoming environment that is, Holiday Inn Amritsar. The fresh international brand to celebrate and explore Amritsar.

Salary: Negotiable

Industry: Travel / Hotels / Restaurants / Airlines / Railways

Functional Area: Hotels, Restaurants

Role Category: Housekeeping

Role: Housekeeping Executive/Assistant.

Desired Candidate Profile

Friendly, pleasant personality, Service-oriented.

You should ideally be Graduate/ Diploma holder in HM and at least 2 years of experience as a supervisor in good brand with good communication skills, English is a must.

In return we'll give you a competitive financial and benefits package. Hotel discounts worldwide are available as well as access to wide variety of discount schemes and the chance to work with a great team of people. Most importantly, we'll give you the room to be yourself.

*Please get in touch and tell us how you could bring your individual skills to IHG. Education-

UG: Any Graduate/ Diploma holder

PG: Post Graduation Not Required

Say



- Now, let's share the resume with the fellow participant sitting next to you and evaluate each other's effort.

Do

- Congratulate each participant for making their first attempt towards creating an effective resume.
- As a followup activity, you can suggest them to prepare their own resume and show it to you the next day.

Summarize

- Close the discussion by showing some effective resume samples to the candidates.
- Ask the participants what they have learnt from this activity.
- Ask if they have any questions related to what they have talked about so far.

Notes for Facilitation

- Keep printed copies of the activity ready for the session.
- Put down the suggested format of the resume on the board while explaining the steps in preparing a resume.
- Do check the participants' resume and suggest necessary changes.
- Suggested example for the case presented:

Nipesh Singla
 #1XX7, Sector XX-D
 Chandigarh-160018
 Mobile No: 91-988XXXXX01
 E-mail: nxxxxxxxxla@gmail.com

Objective: Seeking an opportunity to use my interpersonal skills and experience to contribute to your company's growth, profitability and objectives.

Professional strengths:

- Proficient in housekeeping
- Experienced in and capable of working with a diverse work force
- Team player and friendly in nature
- Successful working in a multi-cultural environment
- Detail oriented, flexible, and adaptable
- Knowledge of Microsoft Word, Excel, Access and PowerPoint

Educational background

- Diploma in Hotel Management and Catering, Westwood School of Hotel Management, Zirakpur
- High School, Government Boys Senior Secondary School, Sector 15, Chandigarh

Professional internships:

- Housekeeping Intern, XYZ Group of Hotels, New Delhi (June 2010– August 2010)
 - Responsible for cleanliness and maintenance of one floor in the hotel.
 - Got opportunities to make housekeeping arrangements for corporate meetings.

Volunteer Work:

- Student volunteer at children's hospital in Chandigarh.

Nipesh Singla

UNIT 28.4.3: Interview FAQs

Unit Objectives

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

- Discuss the most frequently asked interview questions
- Discuss how to answer the most frequently asked interview questions

Resources to be Used

- Participant Handbook

Say

- Tell the participants you will provide them with interview situation and questions and they have to try to answer them.
- Tell them you will also explain the different ways to approach these questions.

Do

- Divide the class in pairs and ask the participants to perform a role play.
- One partner will play the role of the interviewer while the other will play the role of the interviewee.
- Tell them the interviewer can start the interview by asking the interviewee to introduce himself/herself.
- Call all the pairs one by one in front of the class to enact the role play.
- Follow the same pattern for all other situations.
- Time allowed for each situation is 8-10 minutes.
- Congratulate each participant for giving their input.
- Ask the class to applaud each time a team has completed their role play.
- Keep a check on time.

Role Play

Conduct a role play for the situation given.

Situation 1

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

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

Say

De-brief:

- When you put information on your resume, you should be prepared to answer any questions about it.
- Be present and focused on the questions being asked to you.
- One way of tackling the blunt questions is to tell the interviewer you did not come across an opportunity where you were sufficiently satisfied with both the remuneration offered as well as the profile. Therefore, you waited for the right opportunity to come along while looking for an ideal job.

Role Play

Conduct a role play for the situation given.

Role Play – Situation 2

- The interviewer will start by asking the interviewee a few generic questions such as:
 - What is your name?
 - Tell me something about yourself?
 - Can you tell me something about your family?
- Then, at the end of the interview, ask the interviewee:
 - There are over 200 people who have applied for this job, some with excellent work experience. Why should I hire you?

Say

De-brief:

- There is nothing wrong with stating your strengths and achievements. However, do not come across as arrogant or too boastful.
- You need show the interviewee that you have unique skills or talents to contribute to the company. The interviewer needs to know how you stand apart from the rest of the crowd.
- Tell the interviewer you are looking forward to working with the company and that you are a hard-working individual.

Role Play

Conduct a role play for the situation given.

Role Play – Situation 3

- The interviewer will start by asking the interviewee a few generic questions such as:
 - What is your name?
 - Tell me something about yourself?
 - Can you tell me something about your family?
- Then, lean forward, clasp your hands on the table and in a soft voice ask the interviewee:
 - Did you ever experience any neglect or disregard from your previous office? In other words, did you ever suffer because your office or team displayed favouritism?

Say

De-brief:

- Keep this in mind: Do not criticize anyone during an interview.
- You are free to express your opinion, however, your language, answers, body language, and the tone of your voice should remain constructive and neutral.
- Since criticism will show you in negative light, you should keep your answers honest yet diplomatic.
- You can tackle such questions by saying, “I got along well with most of my faculty and peers.”

Role Play

Conduct a role play for the situation given.

Role Play – Situation 4

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

Say

De-brief:

- Don't provide unreal and idealistic answers.
- Your answers should be honest yet diplomatic. In a situation like this, the interviewer does not expect you to provide a specific timeline.

- You can say something like, “I would like to stay with the company as long as I can contribute constructively and develop as an employee, within the organization, professionally and financially.”

Role Play

Conduct a role play for the situation given.

Role Play – Situation 5

- The interviewer will start by asking the interviewee a few generic questions such as:
 - What is your name?
 - Tell me something about yourself?
 - Can you tell me something about your family?
- Ask him/her how important he/she thinks it is to be punctual in the corporate world.
- After he/she answers, look up sternly at the interviewee and in a crisp voice, say:
 - You were late for this interview by 10 minutes. That surely does not seem to be in line with what you just said?

Say

De-brief:

- Politely apologize for being late.
- You can add something such as, “I assure you this is not a habit”. All your future actions should be in line with this statement.
- Avoid giving any excuses.
- You might feel obligated to provide a justification for your tardiness, but the interviewer is not interested in that.
- Do not over apologize. Once this response is out of the way, turn your focus back to the interview.

Role Play

Conduct a role play for the situation given.

Role Play – Situation 6

- The interviewer will start by asking the interviewee a few generic questions such as:
 - What is your name?
 - Tell me something about yourself?
 - Can you tell me something about your family?
- After asking a few academic or job-related questions, ask the interviewee:
 - If you get this job, what salary package do you expect us to give you?

Say

De-brief:

- If there is no way for you to avoid this question, respond to the interviewer by providing a reasonable and well-thought out salary range.

Role Play

Conduct a role play for the situation given.

Role Play – Situation 7

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

Say

De-brief:

- Ask relevant questions.
- Don't bombard the interviewer with questions.
- If you have questions about the result of the interview, you can limit your questions to 1 or 2. Keep them short and relevant like:
 - When will I be informed about the results of the interview?
 - What are the working hours?
 - Will the job require me to travel?

Explain

- Tell the participants to be prepared for answering different types of questions in an interview.
- Stay calm and focused, and take a moment to think about how you should respond. Always maintain a confident tone.
- Even if you don't intend to, your body language conveys your level of discomfort with a particular question.
- Try to keep your actions, tone, and gestures neutral.
- Maintain your composure while answering personal questions.

Do 

- Tell all the participants to form pairs again.
- Tell them to use the following list of frequently asked interview questions to conduct mock interviews.
- They will use all or some of these questions to conduct mock interviews with their partners.
- One partner will play the role of the interviewer while the other will play the role of the interviewee.
- After they are through asking and answering the questions, the roles will be reversed.
- The same list of questions will be used again.
- After each mock interview ask the interviewer to provide feedback and clear any doubts that may arise.
- Time allowed for each situation is 30-35 minutes.

Activity 

Mock Interview Questions

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

Summarize 

- Close the discussion by discussing the questions in the both activities.
- Ask the participants what they have learned from this activity.
- Ask if they have any questions related to what they have talked about so far.

UNIT 28.4.4: Work Readiness – Terms and Terminology

Unit Objectives

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

- Identify basic workplace terminology

Resources to be Used

- Participant Handbook
- Chart papers
- Blank sheets of paper
- Pens

Ask

- What do you understand by workplace terminology?
- Are offer letter and contract of employment the same?

Say

- Let's start this unit with an activity.

Team Activity

Workplace terminology

- This is a group activity conducted in three parts.

Part 1

Sheila received a call from the recruiter of MND Company. Before she is recruited by the company, think of the recruitment process she will have to go through. Start from the telephone call to signing her letter of acceptance. Write down all the words that come to your mind.

Activity De-brief

- Have the participants read out the words they have written
- Encourage all the participants to participate in the activity

Do 

- Divide the class into small groups of 4 or 6.
- Instruct the participants that they will be doing a brainstorming activity.
- Give them one chart paper each. Tell them to divide the chart in two parts.
- Instruct them that they have to use one half of the chart paper now. The other half will be used later.
- The participants have to write all the words that come to their mind related to the recruitment process.
- Give them 10 minutes to do the activity.
- Tell them that there are no right or wrong answers.
- Keep a track of the time.

Say 

- You all know quite a few words related to the terms used in the office.
- Let us talk about some new terms that have been missed out.
- Discuss “Work Readiness – Terms and Terminology” with the participants as given in the Participant Handbook.

Ask 

- Why is it important to know the workplace terms?
- How do they help?
- Can the words be categorised further?

Say 

- Let's now continue the activity.

Team Activity 

Terms and Terminology

- This is again a group activity. The members of the group remain the same as in Activity 1.

Part 2

- With the help of the new terms you have learned, make a flowchart of the hiring process of MND Company.

Activity De-brief

- Ask the groups to share the flowcharts and the new terms they added while preparing the flowchart.

Do 

- Instruct the participants that they have to use the 2nd half of the same chart they had used before.
- Using the new terminology and the terms they had previously written on the chart, they have to make a flow chart of the hiring process of the MND Company.
- Give them 10 minutes for this activity.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Say 

- Let's go ahead with the activity.

Team Activity 

Terms and Terminology

- The activity continues with the same group members.

Part 3

Sheila now works for the MND Company. She is not aware of the company culture and policies. She goes to the HR Department to get her doubts clarified. Can you think of the terms for which she wants clarity? Make a list of those words.

Activity De-brief

- Ask the groups to share their list of words. Some of the words are benefits, compensation, education, employee training, holidays, lay-off, leave, maternity leave, mentor, notice, paternity leave, and time sheet.

Do 

- Instruct the participants to identify the key terms an employee of a company should know. They can use the same chart paper for this activity.
- Give them 5 minutes for this activity.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Summarize 

- Note: You can either summarize the key points of the unit or have a role play where an employee has just joined a company and the HR Manager explains the terms of employment.

UNIT 28.5: Understanding Entrepreneurship

Key Learning Outcomes

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

1. Discuss the concept of entrepreneurship
2. Discuss the importance of entrepreneurship
3. Describe the characteristics of an entrepreneur
4. Describe the different types of enterprises
5. List the qualities of an effective leader
6. Discuss the benefits of effective leadership
7. List the traits of an effective team
8. Discuss the importance of listening effectively
9. Discuss how to listen effectively
10. Discuss the importance of speaking effectively
11. Discuss how to speak effectively
12. Discuss how to solve problems
13. List important problem-solving traits
14. Discuss ways to assess problem solving skills
15. Discuss the importance of negotiation
16. Discuss how to negotiate
17. Discuss how to identify new business opportunities
18. Discuss how to identify business opportunities within your business
19. Explain the meaning of entrepreneur
20. Describe the different types of entrepreneurs
21. List the characteristics of entrepreneurs
22. Recall entrepreneur success stories
23. Discuss the entrepreneurial process
24. Describe the entrepreneurship ecosystem
25. Discuss the purpose of the Make in India campaign
26. Discuss key schemes to promote entrepreneurs
27. Discuss the relationship between entrepreneurship and risk appetite
28. Discuss the relationship between entrepreneurship and resilience
29. Describe the characteristics of a resilient entrepreneur
30. Discuss how to deal with failure

UNIT 28.5.1: Concept Introduction (Characteristics of an Entrepreneur, types of firms/ types of enterprises)

Unit Objectives

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

- Discuss the concept of entrepreneurship
- Discuss the importance of entrepreneurship
- Discuss the characteristics of an entrepreneur
- Describe the different types of enterprises

Resources to be Used

- Participant Handbook

Say

- Let's start this session with some interesting questions about Indian entrepreneurs.

Team Activity

Quiz Questions

1. Who is the founder of Reliance Industries?
Dhirubhai Ambani
2. Who is the Chairman of Wipro Limited?
Azim Premji
3. Who launched e-commerce website Flipkart?
Sachin Bansal and Binny Bansal
4. Who is the founder of Paytm?
Vijay Shekhar Sharma
5. Who is CEO of OLA Cabs?
Bhavish Aggarwal
6. Who is the founder of Jugnoo?
Samar Singla (autorickshaw aggregator)
7. Who is the founder of OYO Rooms?
Bhavish Aggarwal

Do 

- Tell them that you will ask them few questions about a few entrepreneurs.
- Divide the class in to two groups.
- In turns ask the quiz questions to the groups.
- If the answer is incorrect pass the question to the other group.
- Share the answer if the groups are not able to answer.
- Congratulate the participants who answered correctly.

Ask 

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

Say 

- Talk about entrepreneurs, importance of entrepreneurship, characteristics of successful entrepreneurs, and different types of enterprises in India as discussed in the Participant Handbook.
- Tell the participants, stories of successful Indian entrepreneurs- their struggles, the moments of heartbreak, the perseverance and triumph.
- Ask them if they know of any such entrepreneur.

Summarize 

- Close the discussion by summarizing about the opportunities for entrepreneurs in India.

Notes for Facilitation 

- Check out different Government schemes for small entrepreneurs. Share the information with the participants.
- You can tell them about the government websites like Start Up India, mudra.org.in etc.
- Discuss about various schemes and policies by the Government of India for entrepreneurs.

UNIT 28.5.2: Leadership and Teamwork

Unit Objectives

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

- List the qualities of an effective leader
- Discuss the benefits of effective leadership
- List the traits of an effective team

Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

Do

- Show the picture given below to the class.
- Ask them to quickly write on a piece of paper what comes to their mind after seeing the picture.
- Now ask them, "What do you understand from this picture?"
- Encourage participants to share their thoughts.

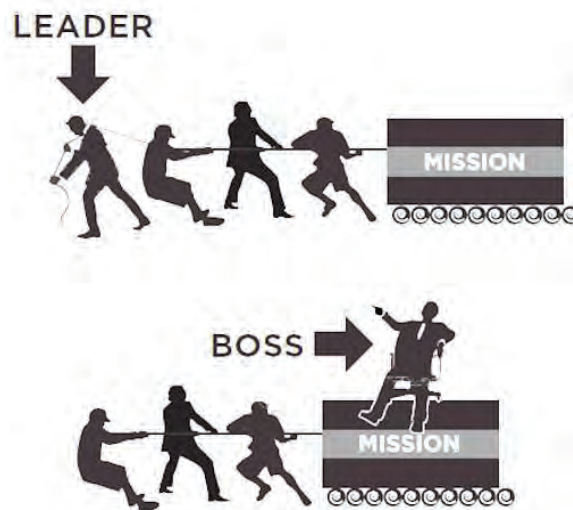


Fig 28.5.1: Sharing thoughts

Say 

- This picture depicts the qualities of a leader and the difference between a leader and a boss.
- A boss focuses on structure and inspires fear whereas a leader follows vision and generates enthusiasm.
- A boss blames employee for the breakdown whereas a leader fixes breakdowns.
- A boss depends on authority whereas a leader depends on goodwill.
- A boss says "I" and a leader says "We."
- A boss drives employee whereas a leader coaches them.
- A boss takes credit whereas a leader gives credit.

Say 

- Talk about leadership and leadership qualities for an entrepreneur as discussed in the Participant Handbook.

Ask 

- Why is it important for a leader to be effective? How does it help the organization?

Say 

- Let us discuss benefits of effective leadership as discussed in the Participant Handbook.
- "Out-of-the-box thinking" is one of the new leadership styles. It means thinking differently and from a new perspective.

Ask 

- Do you consider yourself a team player?

Team Activity 

Long Chain

- This is a group activity.

Do 

- Divide the class into 2 teams.
- Ask each team to create a chain using materials they have in class such as shoe laces, belts, paper, handkerchief, ribbons, etc.
- The team that creates the longest chain wins the game.
- Observe if the participants are interacting with their team or working in isolation.
- Share your observations with the class.

Say

De-brief:

- What did the winning team do differently?
- Who was responsible for the winning team's success?
- How does this activity explain the role of teamwork in entrepreneurial success?

Say

- Tell the class that both the teams performed well.
- Discuss that the objective of this activity was to open communication channels and how this has been achieved.
- The participants should aim to keep the communication channels open when interacting with their peers and team members.
- It will set the pace and enthusiasm required for all the ensuing teamwork activities.
- Talk about teamwork and importance of teamwork in entrepreneurial success as discussed in the Participant Handbook.

Summarize

- Close the discussion by summarizing about the importance of teamwork for employees.
 - Teamwork helps in reducing stress for the employees.
 - Teamwork helps employers in generating more number of solutions to a problem and developing improved communication amongst employees.
- Ask the participants what they have learned from these exercises.
- Ask if they have any questions related to what they have talked about so far.

UNIT 28.5.3: Communication Skills: Listening & Speaking: The Importance of Listening Effectively

Unit Objectives

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

- Discuss the importance of listening effectively
- Discuss how to listen effectively
- Discuss the importance of speaking effectively
- Discuss how to speak effectively

Resources to be Used

- Participant Handbook

Activity

Activity – Chinese Whisper

Step 1: Form a circle.

Step 2: Start a whisper chain. Any one participant will whisper a message into his/her neighbour's ear. No one else must hear the message. The message can be serious or downright silly.

Step 3: The next person who first heard the message should whisper the message very quickly to the person sitting next to them.

Step 4: The game goes on until the last person says whatever they heard out loud and the first person reveals the real message.

Compare them and have a great laugh!

Ask

De-brief questions:

- Was the original message the same as the message that is communicated at the end of the game?
- Why do you think there was a difference in the messages?

Say

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

- There are various aspects to communication. Speaking skills and listening skills are two major components to any communication. There is always some room for improvement in the way we communicate.
- It is important to accept the reality of miscommunication and work to minimise its negative impacts.

Say

- Communication is a two-way process where people exchange information or express their thoughts and feelings
- It involves effective speaking and effective listening.
- If I go to the store to get bread, I exchange money for the bread. I give something and get something in return.
- Communication takes place in the same manner. You have to provide and receive information for communication to take place.

Ask

- How often do you hear these statements?
 - "You're not listening to me!"
 - "Why don't you let me finish what I'm saying?"
 - "You just don't understand!"
- What do you think the other person is trying to convey to you through these sentences?
- We will not talk about the importance of listening effectively as discussed in the Participant Handbook.

Say

- Let's play a game to understand effective listening process better.

Do

- This is a class activity.
- The participants need to answer the questions they hear.
- Instruct them to listen carefully.
- You will read it at a stretch and if need be repeat it once more.
- Tell the participants to raise their hand if they know the answer to the question asked.
- Keep a check on me.

Activity

Riddles:

Is there any law against a man marrying his widow's sister?

If you went to bed at eight o'clock at night and set the dock's alarm to ring at nine o'clock, how many hours of sleep would you get?

Do they have a 26th of January in England?

If you had only one match and entered a dark room that had a kerosene lamp, oil heater, and a wood stove, what would you light first?

The Delhi Daredevils and the Chennai Super Kings play five IPL matches. Each wins three matches. No match was a tie or dispute. How is this possible?

There was an airplane crash. Every single person died, but two people survived. How is this possible?

If an airplane crashes on the border of two countries, would unidentified survivors be buried in the country they were travelling to or the country they were travelling from?

A man builds an ordinary house with four sides except that each side has a southern exposure. A bear comes to the door and rings the doorbell. What is the colour of the bear?

Answers:

There's no law against a man marrying his widow's sister, but it would be the neatest trick in the book since to have a widow, the man would have to be dead.

You'd get one hour's sleep since alarm clocks do not know the difference between morning and night.

Oh, yes. They have a 26th of January in England. They also have a 27th, a 28th, and so on.

First of all, you would light the match.

Who said the Delhi Daredevils and the Chennai Super Kings were playing against each other in those games?

Every SINGLE person died, but those two were married.

You can't bury survivors under any law especially if they still have enough strength to object.

The bear that rang the doorbell would have to be a white bear. The only place you could build a house with four southern exposures is at the North Pole where every direction is in South.

Ask

De-brief questions:

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

Say

- There is a difference between hearing and listening.
- If you don't listen properly, the message may be misunderstood.
- Be open-minded while listening to someone.
- It is important to listen effectively and carefully without making assumptions.

Activity

Elevator Pitch:

You are in the lobby of a hotel and you bumped into your former client who is a famous businessman. He has financed a lot of small business ventures and can finance your new start-up too. After exchanging pleasantries, he asks you what your new company does. You open your mouth, and then pause. Where do you even begin?

Then, as you try to organize your thoughts, his meeting is called, and he is on his way. If you would have been better prepared, you're sure that he would have stayed long enough to schedule a meeting with you too.

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

Do

- Start off the task by providing a beginning sentence to get the story started, and then go around the classroom getting each one to add a new sentence to keep the story going.
- This task should be done spontaneously allowing only a little time to think (30 seconds).
- For example: There was once a student who was looking for a job after graduation.

Notes for Facilitation

- Tell the participants to follow these steps to create a great pitch, but bear in mind that you'll need to vary your approach depending on what your pitch is about.
1. **Identify Your Goal:** Start by thinking about the objective of your pitch. For instance, do you want to tell the potential clients about your organization? Do you have a great new product idea that you want to pitch to an executive or do you want a simple and engaging speech to explain what you do for a living?
 2. **Explain What You Do:** Start your pitch by describing what your organization does. Focus on the problems that you solve and how you help people. Ask yourself this question as you start writing: what do you want your audience to remember most about you? Keep in mind that your pitch should excite you first. After all, if you don't get excited about what you're saying neither will your audience. People may not remember everything that you say, but they will likely remember your enthusiasm.
 3. **Communicate Your USP:** Your elevator pitch also needs to communicate your unique selling proposition or USP. Identify what makes you, your organization or your idea unique. You'll want to communicate your USP after you've talked about what you do.

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

Example:

Here's how your pitch could come together:

"My company deals with cloth retail online business and we use various e-commerce platforms to sell our products. This means that you can do shopping with ease and spend time on other important tasks. Unlike other similar companies, we have a strong feedback mechanism to find out exactly what people need. This means that, on average, 95 percent of our clients are happy with our products. So, how can you help us in creating our own web portal?"

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

Summarize

- Close the discussion by summarizing how to speak effectively as discussed in the Participant Handbook.

UNIT 28.5.4: Problem Solving & Negotiation Skills

Unit Objectives

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

- Discuss how to solve problems
- List the important problem-solving traits
- Discuss ways to assess problem solving skills
- Discuss the importance of negotiation
- Discuss how to negotiate

Resources to be Used

- Participant Handbook

Ask

- What is a 'problem'?
- What do you think are the problems you may face in the process of becoming a successful entrepreneur?

Say

- Discuss the definition of problem as given in the Participant Handbook.
- In a hurdle race the hurdles are the obstacles on the way to reach your goal.
- Similarly, obstacles are the hurdles you may face while reaching your goal i.e. to set-up your own business.
- Your goal will be to reach the finishing line after crossing these hurdles.

Ask

- What do you do when you face a problem?
- How do you resolve it? You can pick examples from the questions asked previously 'the problems they are likely to face in the process of becoming a successful entrepreneur'.

Say

- Discuss how to solve problems as given in the Participant Handbook.

Team Activity

- This is a group activity.
- The groups will solve the problem and come up with the best solution in each case.

1. Unable to arrange for some extra finance for setting up a beauty parlour. The loan sanctioned and disbursed is not enough. You have tried all your contacts, friends and relatives. But unable to manage the extra amount. Bank will not sanction more amount as you have used up the complete sanction limit.
2. You have rented a space for your business and all arrangements are done. You will be operating from the office space rented in two days. Now the owner comes up to you and says he wants to sell the place and wants you to vacate in 15 days.
3. You have just set up your business and need extra human resource. You have tried interviewing a few also reached up with an agency for getting the right candidate. But you are unable to get the right candidate. If the candidate is good, you cannot offer the salary demanded. If the candidate agrees to the salary, he/she has other demands like working hours to be reduced, leaves etc. which may not work for your set up.

Do

- Divide the class into three groups. Give one scenario to each group.
- Explain the purpose and duration of the activity.
- Ask the groups to build on the scenario and present their solution as a role play.

Say

De-brief questions:

1. What was the problem?
2. Is there any other alternative solution?
3. Is this the best solution presented?

Ask

- Try to think of some people around you who are able to solve problems very easily. Even you or your friends might be approaching them when there is a problem. What qualities do they have? What personality traits do such people possess?

Say

- Discuss the important traits for problem-solving as given in the Participant Handbook.

Ask

- In order to build a successful organization, you need to hire people who possess good problem-solving skills.
- How would you assess the level of problem solving skills of potential candidates before hiring them?

Say

- Discuss how to assess for problem-solving skills as given in the Participant Handbook.

Summarize

- Ask the participants the things that they have learnt so far.
- Ask if they have any questions related to what they have talked about so far.
- Summarize the discussion on problem solving.

Activity

- The activity is to organise an election event. Select three volunteers from the group. They have to give a speech on their election manifesto to the class. They have to negotiate with the fellow participants and convince them to vote for them. The best negotiator will win the election.

Do

- Ask three participants to volunteer for the activity.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Ask

- Out of the three contestants, whom would you support? Why? What did they say or do which convinced you to make your decision?
- Have you ever tried to negotiate in your personal or professional life?
- Ask the class to share some of their experiences where they have been able to strike a deal by negotiating.

Say

- Discuss “What is Negotiation?” as given in the Participant Handbook.

Ask

- Why is it important to negotiate? As an entrepreneur, where do you think that negotiation skills will be needed?

Say

- Discuss the importance of negotiation while starting a business as given in the Participant Handbook.

Say

- Discuss the important steps to negotiate as given in the Participant Handbook.

Role Play

- Conduct a role play activity.
- Ask the participants to assemble together.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.

Do

- Divide them into groups of four (4) (depending on the batch size).
- Give them the hand-outs for role play scenarios.
- Two groups to be given scenarios on problem solving.
- Other two groups to be given scenarios on negotiation.
- The groups will build on the scenarios and prepare for the role play.
- Give the groups at least 5 mins to discuss and be ready with the role play.
- Invite each group one by one to come and present their role play.

Problem solving Scenario 1

Avinash has a Mobile Repair Store in Allahabad. His outlet is one of the most popular one in the vicinity and he has great rapport with his customers. He is always well-dressed, jovial and full of energy.

It's around 11 AM, when a customer barges in to the shop and starts shouting at Avinash for giving her back the instrument which is still not working. The screen of her mobile is also cracked from one side. Avinash remembered thoroughly checking the handset before handing it over to the customer. The customer threatens to sue the company and to go to Consumer Court for cheating her.

Problemsolving Scenario 2

You are running a successful small scale business, Shreeji Aggarbais. Your staff members do door to door selling and organise marketing campaigns in local markets. Your brand has established its name in last few years.

Recently, lot of customers have been coming to you and lodging complaints that your staff members indulge in malpractices. Few of them informed you that a staff member engaged them in a friendly conversation. In the meanwhile, the other gave them lesser packets of aggarbais than they paid for.

Another set of customers lodged complaint about the misconduct and rude behaviour of a particular staff member. You often hear from your customers that the orders don't get delivered on time or wrong products get delivered. You have already been struggling with shortage of staff and such complaints are a serious concern as it is hampering your brand image. What strategies will you adopt to solve this problem?

Negotiation Scenario 1

You have interviewed a prospective new employee who could be a key member of your new entrepreneurial venture. The new person is demanding a salary that is 20% higher than you thought based on your business

plan. Finances are tight, yet you believe this person could make a significant impact on future profits. If you paid the required salary for the new person, then you would have to restructure your entire business plan. You've been searching for an individual with this skill level for three months. The candidate is waiting for your response. Now you have to call him in to make the final negotiations.

Negotiation Scenario 2

You are a young entrepreneur who has just registered his start up project and applied for a bank loan accordingly. You receive a letter saying that your loan application has been rejected as your start up idea did not appeal to the bank and they think that it is not a revenue generating model. You have taken an appointment to meet the manager and show your negotiation skills to get your loan approved.

Notes for Facilitation

Facilitating Role Plays**Preparing for the activity**

1. Carefully review the details of the scenario and the character descriptions.
2. Become familiar with the key issues being addressed in the scenario.
3. Study the provided material so that you are ready to address issues related to the situations depicted in the role-plays.
4. Anticipate and know how to address issues participants might raise during the activity.

Conducting the activity

1. Introduce the activity. Emphasize that role-playing provides participants with an opportunity to apply their new knowledge, skills, and tools in situations that simulate actual interactions with customers.
2. Ask participants to form pairs. Direct the members of each group to choose who will play the roles. Remind the groups that each participant should be given the opportunity to play/practice the different roles.
3. Conduct a demonstration so that participants become familiar with the expectations related to the roles and support materials.
4. Give the pairs/groups 10 to 15 minutes to conduct the role-play (depending on the duration of the session).
5. After all the groups have finished with the role-play, conduct a debriefing session on each role-play.
6. Ask the groups to take five minutes to talk about what happened during the role-play. The groups should discuss the questions given in the debriefing for each role-play.
7. Encourage participants to provide constructive criticism during their discussions.

Summarize

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

UNIT 28.5.5: Business Opportunity Identification: Entrepreneurs and Opportunities

Unit Objectives

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

- Discuss how to identify new business opportunities
- Discuss how to identify business opportunities within their business

Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

Ask

- How does an entrepreneur identify an opportunity?
- What do you think are the common queries or concerns faced by entrepreneurs?
- How can you identify new business opportunity?

Say

- Let's talk about opportunity, common queries or concerns faced by entrepreneurs, idea as an opportunity, factors to consider when looking for opportunities, ways to identify new business, and opportunity analysis as discussed in Participant Handbook.
- Let's do an activity to understand ways to identify business opportunities within your business.

Do

- Tell the class that this is an individual activity.
- Tell the participants to create a matrix on their notebooks.
- There will be four boxes in your matrix.
- Strength, Weakness, Opportunity and Threats will be the four headings of the matrix. This is called the SWOT matrix.
- Read out the questions to them and tell the participants they need to answer the questions asked in each matrix.
- Tell them they can also use their own understanding of themselves to fill the SWOT matrix.

Activity

Do your SWOT analysis

<p>Strength What are your strengths? What unique capabilities do you possess? What do you do better than others? What do others perceive as your strengths?</p>	<p>Weakness What are your weaknesses? What do your competitors do better than you?</p>
<p>Opportunity What trends may positively impact you? What opportunities are available to you?</p>	<p>Threat Do you have solid financial support? What trends may negatively impact you?</p>

Do

- Congratulate everyone for the class activity.
- Ask the audience to applaud for themselves.
- Allot the participants sufficient time to complete this activity, but do keep a check on time.
- Ask de-brief questions to cull out information from the participants.

Ask

De-brief questions:

- What are your weaknesses according to your SWOT analysis?
- Do you think you can change your weakness into strength? How?
- Do you think you can work on your threats? How?

Summarize

- Close the discussion by summarizing ways to identify business opportunities within your business.
- Ask the participants what they have learned from this exercise.
- Ask if they have any questions related to what they have talked about so far.

UNIT 28.5.6: Entrepreneurship Support Eco-System

Unit Objectives

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

- Explain the meaning of entrepreneur
- Describe the different types of entrepreneurs
- List the characteristics of entrepreneurs
- Recall entrepreneur success stories
- Discuss the entrepreneurial process
- Describe the entrepreneurship ecosystem
- Discuss the purpose of the 'Make in India' campaign
- Discuss the key schemes to promote entrepreneurs

Resources to be Used

- Participant Handbook
- Chart papers
- Marker pens
- Pencils
- Colour pencils
- Scale
- Eraser
- Other requisite stationery material

Ask

- Do you think that entrepreneurs need support?
- What do you think is an eco-system?
- What do you think 'entrepreneurship support eco-system' means?

Say

- Let's learn what entrepreneurship support eco-system means
- Discuss 'Entrepreneurship Support Eco-System' as given in the Participant Handbook

Ask

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

Say 

- Let's learn more about these domains by conducting an activity.
- You have to make a poster showing the components of the six main domains of entrepreneurship support eco-system.

Team Activity 

- Making a poster showing the entrepreneurship support eco-system.

Do 

- Divide the class into groups of four or six.
- Hand out chart paper and coloured pens.
- Explain the purpose and duration of the activity.
- Go around checking the progress of each group.
- Set guidelines pertaining to discipline and expected tasks.

Activity De-brief

Ask each group to display their poster and explain the key domains of entrepreneurship support eco-system.

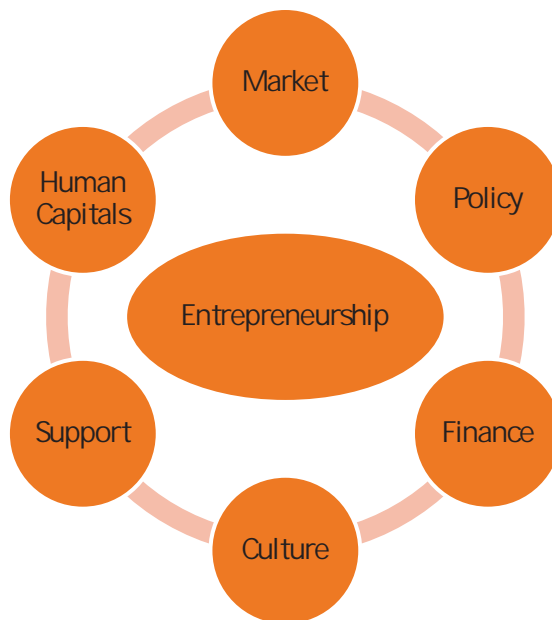


Fig 28.5.2 Key domain of entrepreneurship

Ask 

- What kind of government support eco-system is available for entrepreneurs in India?

Say

- Discuss 'Make in India' campaign as given in the Participant Handbook.

Team Activity

- Presentation on key schemes to promote entrepreneurs

Do

- Divide the class into pairs.
- Number each pair from 1-15.
- Assign a scheme, same as their group number, to each group.
- Ask them to read the scheme carefully and present it to the class.
- Explain the purpose and duration of the activity.
- Go around checking the progress of each group.
- Set guidelines pertaining to discipline and expected tasks.

Activity De-brief

- Ask each group to explain the scheme offered by government to promote entrepreneurs.

Summarize

- Summarize the unit by discussing the key points and answering questions the participants may have.

UNIT 28.5.7: Risk Appraisal & Resilience

Unit Objectives

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

- Discuss the relationship between entrepreneurship and risk appraisal
- Discuss the relationship between entrepreneurship and resilience
- Describe the characteristics of a resilient entrepreneur

Resources to be Used

- Participant Handbook
- Chart papers
- Blank sheets of paper
- Pens
- Marker pens

Ask

- Can you define risk or explain what constitutes a risk?
- What do you people mean when they say, "This may be a risky proposition"?
- What risks are they talking about?

Example

- Let's have a look at these two examples:

Rohit and his family were travelling by car from Delhi to Nainital. It was their second trip there. Rohit was familiar with the road. His friends told him that the highway after Rampur was in a bad condition. They advised him to take a shortcut and turn left from Moradabad and take the Kaladhungi road. This road is in a better condition. Since he was going with his family, and did not want to take the risk of getting lost, he left early. He took the Kaladhungi road and reached Nainital well in time.

Suresh and his family too were travelling by car from Delhi to Nainital. It was their second trip there. His friends too advised him to take a shortcut and turn left from Moradabad and take the Kaladhungi road as this road was in a better condition. Suresh too decided to take the Kaladhungi road but he left Delhi in the afternoon. It was dark by the time he reached Kaladhungi, and he was sure that he was taking the correct turn. As it was late, he could not find anyone to give him directions. He ended up being in an unknown place that was scarcely inhabited.

Say

- Let's see what type of risks Rohit and Suresh took.
- Discuss 'Risk Appetite and Resilience' with the participants as given in the Participant Handbook.

Say

- Let's learn more about risk appetite and resilience with the help of an activity.

Team Activity

Risk Appetite

- This is a group activity.

- In the previous unit, you read success stories of Mr Dhirubhai Ambani and Dr Karsanbhai Patel.
- Mr Ambani left his job and started his company Reliance with just Rs. 50,000/-.
- Dr Patel kept his job, went door-to-door to sell Nirma, and only when the brand started gaining popularity did he start his own company.
- What types of risk did both of them take?
- What risk factors, do you think, did they keep in mind before launching their company?
- Write the Risk Appetite Statement of both the companies.

Activity De-brief

- Who took a greater risk?
- What are the differences between the Risk Appetite Statement of both the companies?

Do

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

Ask

- Do you think all entrepreneurial ventures are successful?
- What happens if the first venture is not successful?
- Should the entrepreneur stop when faced with challenges or face them?

Example

- Let's have a look at the following example:

Vijay Shekhar Sharma is the founder of Paytm, which is a giant Indian e-commerce. He was born in a middle-class family in Uttar Pradesh. He started his first job at an MNC. He quit after six months and built a company One97 with his friends. As One97 grew bigger, it needed more money because it was running more servers, bigger teams, and had to pay royalty. At that time, the tech bubble popped and technology companies were running in losses. Finally, money ran out. So One97 took loans and then more loans at higher rates of interest, as high as 24 per cent, and became caught in a vicious cycle.

In 2014, Paytm was launched with online wallet services after which, the company enabled online payment transactions. The company got licenses from RBI in 2016 to launch India's first ever payment bank. Moreover, the main motive of Paytm was to transform India into a cashless economy.

After demonetization came into effect, Vijay Shekhar Sharma started promoting online and digital transactions to deal with the cash crunch. In fact, the service of the company's mobile wallet is accepted across India. The logo of Paytm is now popular almost everywhere from tea stalls to major companies.

Say

- Let's see what qualities made Vijay Shekhar Sharma a resilient entrepreneur.
- Discuss Entrepreneurship and Resilience with the participants as given in the Participant Handbook.

Say

- Let's learn more about entrepreneurship and resilience with the help of an activity.

Team Activity

Entrepreneurship and Resilience

- This is a group activity.
- Think of some entrepreneurship ventures that faced challenging times, but later resulted in success stories.
 - Who is the founder of that company?
 - What challenging times did it face?
 - How did it overcome those challenges?
 - List the resilient characteristics of the entrepreneur.

Activity De-brief

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

Do

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

Summarize

- You can summarize the key points of the unit.
- Ask the participants what they learned from the activities.
- Clarify any questions or doubts they might have.

UNIT 28.5.8: Success and Failures

Unit Objectives

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

- Discuss how to deal with failure

Resources to be Used

- Participant Handbook

Ask

- Have you heard the quote 'nothing is impossible'?
- What do you think it means?
- Do you think that all successful entrepreneurs became famous overnight or did they have to struggle or face failure before succeeding?

Example

- Let's have a look at this example.

Shah Rukh Khan, also known as, SRK or King Khan is a force to reckon with. Did he achieve stardom overnight?

Shah Rukh Khan, who has seen many struggles in his life – he has slept on streets, struggled to support himself and his sister at a very young age, and lost his parents very early in life, which led to his sister seeking mental health support. Amidst all the chaos and challenges, he kept pushing himself, and today he stands tall as the 'Badshah of Bollywood'. Certainly, those years were not easy for him.

When he was young, he stood at Marine Drive and said, "I will rule this city one day". Failure was not just his companion during or before his stardom, it is still a substantial part of his life. Success does not come easy. What made him a star was his acceptance of failure and the urge to improve.

Say

- How do you define success and failure?
- What is fear?
- Discuss "success and failure" with the participants as given in the Participant Handbook.

Ask

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

Say

- Let's learn the about success and failure with the help of an activity.

Team Activity

- Divide the class into groups of four.
- Instruct them to think of one scenario where they have to interview a successful entrepreneur.
- Explain the purpose and duration of the activity.
- Set guidelines pertaining to discipline and expected tasks.
- They have to choose one person from the group as the interviewee and one as the interviewer.
- Go around and make sure they have understood what is to be done and are discussing the roles properly.
- Check that everyone understands their role. Give clarifications if needed. Give the participants about 5 minutes to discuss and decide their roles.
- Ask the groups to stop the discussion as soon as the time is over.
- Invite each group one by one to come and present their interview as a role play.

Notes for Facilitation

Facilitating Role Plays

Preparing for the activity

1. Carefully review the details of the scenario and the character descriptions.
2. Become familiar with the key issues being addressed in the scenario.
3. Study the provided material so that you are ready to address issues related to the situations depicted in the role plays.
4. Anticipate potential questions that might be raised by the participants and be ready to address them.

Conducting the activity

1. Introduce the activity. Emphasize that role playing provides participants with an opportunity to apply their new knowledge, skills, and tools in situations that simulate actual interactions with customers.

2. Ask participants to form pairs. Direct the members of each group to choose who will play the roles. Remind the groups that each participant should be given the opportunity to play/practice the different roles.
3. Conduct a demonstration so that participants become familiar with the expectations related to the roles and support materials.
4. To maintain spontaneity of the interactions during the role play, ask the participants not to discuss the details of their roles prior to the role play.
5. Give the pairs 15-20 minutes to conduct the role play.
6. Circulate among the groups to answer any questions that may arise and provide guidance as needed.
7. After all the pairs have finished with the role play, conduct a de-briefing session on each role play.
8. Ask the groups to take five minutes to talk about what happened during the role play. The groups should discuss the questions given in the de-briefing for each role play. Encourage participants to provide constructive criticism during their discussions.
9. Conclude the activity by asking participants to think about whether and how they might use scripted role plays in their real life.

Summarize

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

UNIT 28.6: Preparing to be an Entrepreneur

Key Learning Outcomes



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

1. Discuss how market research is carried out
2. Describe the 4Ps of marketing
3. Discuss the importance of idea generation
4. Recall basic business terminology
5. Discuss the need for CRM
6. Discuss the benefits of CRM
7. Discuss the need for networking
8. Discuss the benefits of networking
9. Discuss the importance of setting goals
10. Differentiate between short-term, medium-term and long-term goals
11. Discuss how to write a business plan
12. Explain the financial planning process
13. Discuss ways to manage your risk
14. Describe the procedure and formalities for applying for bank finance
15. Discuss how to manage their own enterprise
16. List the important questions that every entrepreneur should ask before starting an enterprise

UNIT 28.6.1: Market Study/ The 4Ps of Marketing/ Importance of an IDEA: Understanding Market Research

Unit Objectives

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

- Discuss how market research is carried out
- Describe the 4Ps of marketing
- Discuss the importance of idea generation

Resources to be Used

- Participant Handbook
- Chart papers
- Markers/pens
- Blank sheets of paper

Ask

- Suppose, you want to open a restaurant, what are the factors you will consider?
- How will you promote your restaurant?

Example

- Let's have a look at this example.

Arjun was an MBA working in a company. But he wanted to start a low cost budget hostel for foreign tourists coming to India. He did a lot of market research before starting the project. Based on the information he gathered, he made his business plan. His hostel is now flourishing and he is thinking of expanding to other tourist destinations.

Say

- Discuss "Market Study" with the participants. Refer to the Participant Handbook.
- Let's learn about market study and research with the help of an activity.

Team Activity

Market Study

- This is a group activity.
- You want to start your own tuition centre.
- What type of research will you do?

Activity De-brief

- Ask each group to come forward and give a brief presentation.
- Encourage other groups to be interactive and ask questions.
- What factors did you keep in mind while doing your research?
- Based on our research would you go ahead and open a tuition centre?

Do 

- Instruct the participants that this is group work.
- Divide the class into small groups of 4 or 6.
- Give each group a chart paper.
- Tell the participants that they have to start their own tuition centre.
- Give the participants 10 minutes to discuss and write the research work they need to do.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Say 

- By opening a tuition centre you are offering a service.

Ask 

- What factors will you keep in mind before opening it?

Say 

- Discuss “The 4Ps of Marketing” with the participants as given in the Participant Handbook.

Say 

- Let's learn about the 4Ps of Marketing with the help of an activity.

Team Activity 

4Ps of Marketing

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

Keeping the 4Ps of Marketing in mind, what marketing strategy will you design to sell the pen?

Activity De-brief

- Ask each group to present their strategy.
- Encourage other groups to be interactive and ask questions.

Do 

- Instruct the participants that this is group work.
- Divide the class into four groups.
- Give each group a chart paper.
- Assign each group a target audience for selling the pens:
 1. Rural villagers
 2. Rural middle class
 3. Urban middle class
 4. Upper end rich people
- Tell the participants that they have to design a marketing strategy keeping the 4Ps of Marketing in mind.
- Give the participants 20 minutes to discuss and come up with their strategy.
- Keep a check on time. Tell the group to wind up quickly if they go beyond the given time limit.

Activity De-brief

- Ask each group to come forward and give a brief presentation.
- Ask each group what they kept in mind while designing their marketing strategy.
- Encourage other groups to be interactive and ask questions.

Say 

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

Summarize 

- Summarize the key points of the unit.
- Ask the participants what they learnt from the activities.
- Encourage them to ask if they have any doubts.

UNIT 28.6.2: Business Entity Concepts

Unit Objectives

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

- Recall basic business terminology

Resources to be Used

- Participant Handbook

Say

- Let's recall some basic business terminology.
- Discuss the Business Entity Concepts as given in the Participant Handbook.
- Let's learn some basic business terminology by having an activity.
- We will have a quiz today.

Activity

- The activity is a quiz.

Do

- Divide the class in two groups and give a name to each group.
- Explain the rules of the quiz. For each correct answer the group gets 1 mark.
- If the group is unable to answer the question is passed to the next group.
- Explain the purpose and duration of the activity.
- Ask the questions of the quiz.
- Keep a score of the groups.
- Set guidelines pertaining to discipline and expected tasks.

Summarize

- Summarize the unit by discussing the key points.

Notes for Facilitation

QUESTIONS FOR THE QUIZ

1. What does B2B mean?
Business to business
2. What is a financial report?
A comprehensive account of a business' transactions and expenses
3. Who is a sales prospect?
A potential customer
4. How is working capital calculated?
Current assets minus current liabilities
5. What is an estimation of the overall worth of a business called?
Valuation
6. You are buying a house. What type of transaction is it?
Complex transaction
7. How will you calculate the net income?
Revenue minus expenses
8. How is Return on Investment expressed?
As percentage
9. How will you calculate the cost of goods sold?
Cost of materials minus cost of outputs
10. What is revenue?
Total amount of income before expenses are subtracted.
11. What is a Break-Even Point?
This is the point at which the company will not make a profit or a loss. The total cost and total revenues are equal.
12. What is the formula used to calculate simple interest?
 *$A = P(1 + rt)$; $R = r * 100$*
13. What are the three types of business transactions?
Simple, Complex and Ongoing Transactions
14. The degrading value of an asset over time is known as
Depreciation
15. What are the two main types of capital?
Debt and Equity

UNIT 28.6.3: CRM & Networking

Unit Objectives

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

- Discuss the need for CRM
- Discuss the benefits of CRM
- Discuss the need for networking
- Discuss the benefits of networking

Resources to be Used

- Participant Handbook

Ask

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

Say

- The key to every success business lies on understanding the customer's expectations and providing excellent customer service.
- Discuss about CRM and its benefits. Refer to the Participant Handbook.
- Providing excellent customer service entails:
 - Treating your customers with respect.
 - Be available as per their need/ schedule.
 - Handling complaints effectively.
 - Building long lasting relationships.
 - Collecting regular feedback.
- Handle customer complaints proactively. Ask "what happened", "why it happened", "how can it be avoided next time", etc.
- Collecting feedback from the customers regularly will enable you to improve your good/service.
- "Let's understand it better with the help of some case scenarios. You will be given some cases within your groups. You have to analyse the case scenario that has been given to you and then find an appropriate solution to the problem."

Do 

- Divide the class into four groups of maximum six participants depending on the batch size.
- Give one case study to each group.
- Instruct them to read the case carefully.
- The group is expected to analyse and discuss the case amongst them and find a solution to the given problem.
- Put down the discussion points (de-brief questions) on the board. Give the class 5-10 minutes to discuss the case and note down their solutions.
- At the end of 10 minutes, the team should present their case solution to the class.

Team Activity 

Case Study Analysis

Raju runs a business of wooden furniture. He has a huge list of customers on Facebook and WhatsApp who give him orders regularly. Ankita is one of his old and regular customers. She placed an order for a new chester and TV cabinet via WhatsApp and requested Raju to send them as soon as possible. When the parcel reached Ankita through courier she found that chester was broken and the TV unit was chipped from the bottom. Ankita was heartbroken. It was a complete waste of money. She sent a message to Raju on WhatsApp, expressing her anger and disappointment. Raju might lose an old customer forever if he doesn't satisfy the customer. What should Raju do to retain his customer?

Scenario 2

Rajni runs a boutique shop. She sells suits and sarees. She is one of the most successful designer in her city. Rajni swears that all the clothes in her boutique have unique designs. Smita has to attend her cousin's wedding; she goes to Rajni's boutique to buy a saree. Smita wanted a unique designer saree. Rajni customized a saree for her and sent it over the courier. When Smita had a look at the saree she realised her two friends had the same design sarees. She sent a message to Rajni on WhatsApp, expressing her anger and disappointment. Did Rajni make a false promise? Were her designs copied? What could happen to Rajni's image after this incident? What would you do if you were in Rajni's place?

Scenario 3

Shama is a beautician who offers parlour services to ladies by making home visits. Recently, Shama got her name registered on an e-commerce website. Two days earlier, she got a message from Mrs Sushma. The appointment was fixed for next day, 11:00 am and the remuneration for the services was decided beforehand. When Shama reached there at 10:50 am, Mrs Sushma was not at home. When Shama called her, she asked her to wait for a while. Mrs Sushma reached home at 11:45 am. Meanwhile, Shama had to reschedule her next appointment. After availing Shama's services, Mrs Sushma refused to pay the requisite amount and started finding faults in the services provided by her. Who was at fault in this scenario? What should you do in case the customer behaves unreasonably? What would you do if you were in Shama's place?

Scenario 4

Shailender is the manager of a car showroom. He proactively takes part in all the transactions that happen in his showroom. Vinita wants to buy a new car. She has chosen a car from Shailender's showroom. The salesperson has given her a very good discount and has also promised free service for one year. Vinita goes to the showroom and asks to complete all the formalities to purchase the car. When she sees the final bill she realizes that she has not received the promised discount neither was there any mention of the free services. She immediately demands to see the Shailender. When Shailender's head asks how much discount Vinita was promised, he realized the discount will make the sale in loss. The car showroom owner might lose a customer and deal due to false commitments made by his manager. Besides, the customer might tell this to other people, creating a bad name and image for the showroom. If you owned that showroom, how would you have convinced your customer?

Say 

- Now, let's discuss the problem and solution with the class.
- The group will first briefly describe the case to the class.
- Then discuss the issue identified and the proposed solution.
- Present the solution as a role play.
- Post presentation, the other groups may ask questions from the group that has presented.

Do 

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

Say 

- If your customers are happy with you they will give referrals which will help to grow your business.
- One more way of growing business is 'Networking'.
- Discuss Networking and its benefits. Refer to the Participant Handbook.

Activity

Group Discussion

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

Summarize

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

UNIT 28.6.4: Business Plan: Why Set Goals?

Unit Objectives

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

- Discuss the importance of setting goals
- Differentiate between short-term, medium-term and long-term goals
- Discuss how to write a business plan
- Explain the financial planning process
- Discuss ways to manage your risk

Resources to be Used

- Participant Handbook
- Chart papers
- Blank papers
- Marker pens
- Ruler

Ask

- Remember we had written SMART Goals in a previous session? Let's try and recall why it is important to set goals?
- While framing SMART goals, we talked about 'T' in SMART, which was 'Time Bound'? What do we mean by time bound goals?
- What time limit did you set for your goal - 3 weeks, 3 years, 10 years?

Say

- Talk about short term, long term and medium-term goals, as discussed in the Participant Handbook.

Ask

- As you are planning to become an entrepreneur, you must have thought of an idea for a start-up. What is your business idea?

Do

- Ask few participants to share their business ideas.

Ask 

- Have you created a business plan for your business idea?
- Do you think it is important to have a business plan in place? Why/ why not?

Say 

- Talk about 'Why Create a Business Plan' as discussed in the Participant Handbook.
- Let's understand it better with the help of an activity.

Team Activity 

Writing a business Plan

- This is a group activity.
- Give the groups the required resources such as chart paper and markers.
- This activity is divided into two parts:
 1. Create a business idea
 2. Develop a business plan
- The group will discuss and come up with a new business idea and present their idea to the class.
- In the second part of the activity the group will develop a business plan for the business idea.
- The business plan prepared will be presented by the groups to the class.

MY BUSINESS PLAN
Executive Summary: What is your Mission Statement?
Business Description: What is the nature of your business?
Market Analysis: What is your target market?
Organization and Management: What is your company's organizational structure?
Service or Product Line: What is the lifecycle of your product/ service?
Marketing and Sales: How will you advertise and sell your products?
Funding Request: How much fund is required and from where?

Say

- Teams will need to brainstorm for this part of the activity.
- Use the blank papers for the second part of this activity
- Make your business plan on a chart paper based on the following parameters:
 1. Executive Summary
 2. Business Description
 3. Market Analysis
 4. Organization and Management
 5. Service or Product Line
 6. Marketing and Sales
- Explain each parameter in detail as done in the Participant Handbook.
- Discuss each parameter with the business idea examples of the groups.
- Groups will discuss and develop the business plan for their business idea.

Say

- Now, let's share our plan with the class.
- Each group will briefly describe the plan to the class.
- Post presentation, the other groups may ask questions to the group who have presented their plan.

Do

- Congratulate each group for sharing their points.
- Ask the audience to applaud for them.
- Keep a check on time. Tell group to wind up the discussion quickly if they go beyond the given time limit.

Say

- Along with a business plan, you need to create a financial plan and evaluate the risk involved with your start up.
- Discuss 'Financial Planning' and 'Risk Management' in detail as given in the Participant Handbook.

Summarize

- Ask the participants what they have learnt from this exercise/ activity.
- Ask if they have any questions related to what they have talked about so far.

Notes for Facilitation

- Keep the business plan format ready in a flipchart to display it during the activity.

UNIT 28.6.5: Procedures and Formalities for Bank Finance

Unit Objectives

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

- Discuss the importance of setting goals
- Differentiate between short-term, medium-term and long-term goals
- Discuss how to write a business plan
- Explain the financial planning process
- Discuss ways to manage your risk

Resources to be Used

- Participant Handbook
- Bank loan/finance form sample

Ask

- While preparing a business plan in the last session, we discussed financial planning to arrange financial resources for your start-up. Therefore, how will you collect funds to start your business?

Say

- While most entrepreneurs think 'product' is the most difficult thing to decide for a business, start-up capital poses an even a bigger obstacle. Though there are various ways of funding the business, to convince investors to invest money is the most challenging.
- Some of the funding options available in India are:
 - Bootstrapping: Also called self-financing is the easiest way of financing
 - Crowd funding: Funds are collected by consumers pre-ordering or donating for starting the business.
 - Angel investors: Individual or group of investors investing in the company
 - Venture capitalists: Venture capitals are professionally managed funds who invest in companies that have huge potential. They usually invest in a business against equity.
 - Bank loans: The most popular method in India.
 - Microfinance Providers or NBFCs
 - Government programmes
- Let us know discuss the most popular method i.e. bank finance in detail here.

Do 

- Discuss the list of documents that are required to apply for a loan like letter of introduction, business brochure, references of other banks, and financial statements.
- Explain the details to be filled in a loan application form.
- Divide the class into groups. Give each group a loan application form.
- Ask the groups to discuss and fill the form.

Summarize 

- Close the discussion by summarizing the important documents needed for bank loan.
- Ask the participants if they have any questions related to what they have talked about so far.

Notes for Facilitation 

- Checklist of documents is provided as resources for the session.
- You can make some copies and distribute it during the group activity.
- Download sample loan application forms from any nationalised bank's website. Print sufficient copies to circulate it amongst the groups.

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

1. Audited financial statements of the business concern for the last three years
2. Provisional financial statements for the half - year ended on _____
3. Audited financial statements of associate concern/s for the last three years
4. Copy of QIS II for the previous quarter ended on _____
5. Operational details in Annexure I
6. CMA data for the last three years, estimates for current year and projection for the next year
7. Term loan/DPG requirements in Annexure II
8. List of machinery in respect of machinery offered as security in Annexure III
9. Additional details for export advances furnished in Annexure IV
10. Property statements of all directors/partners/proprietor/guarantors
11. Copies of ITAO of the company for the last three years
12. Copies of ITAOs/WTAOs of the directors/partners/proprietor and guarantors
13. Copies of certificate from banks and financial institutions certifying the latest liability with them
14. Copy of board resolution authorizing the company to apply to your bank for the credit facilities mentioned in application

- | |
|---|
| 15. Copy of memorandum and article of association (in case of limited company)/partnership deed (in case of partnership firm) |
| 16. Cash budget for the current year and next year in case of contractors and seasonal industries. |

UNIT 28.6.6: Enterprise Management – An Overview: How to Manage Your Enterprise?

Unit Objectives

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

- Discuss how to manage their own enterprise

Resources to be Used

- Participant Handbook

Ask

- Having set up a business, do you think it is possible to do everything on your own?
- Does one require trained persons for help?
- What does management mean?

Say

- Let's have a look at this example:
Kapil had a small business that was beginning to pick up pace. He wanted to expand his business, and therefore employed few more people. One day, as he was walking past Ramesh, one of his new employees, he overheard Ramesh talking rudely to a customer on the phone. This set him thinking. Kapil realised that he should have regular team meetings to motivate his employees and speak with them about any problems they might be facing during work. He should also conduct training sessions on new practices, soft skills, and technology, and develop work ethics manual for managing his enterprise.

Say

- Was Kapil correct in his approach or he should have scolded Ramesh instantly in front of his other employees?
- Discuss "Enterprise Management – An Overview" with the participants as given in the Participant Handbook.

Say

- Let's learn how to effectively manage an enterprise or business through an activity.

Team Activity

Enterprise Management

- This is a group activity.
- Design a matrix listing the topics and key words that are needed to run an enterprise effectively and smoothly.

Activity De-brief

- Have each group present their matrix.
- Encourage participants of the other groups to ask questions about each other's presentation.

Do

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

Summarize

- Ask the participants what they have learned from this exercise/activity.
- Ask if they have any questions related to what they have talked about so far.
- Close the discussion by summarizing the importance of effective management to run an enterprise as given in the Participant Handbook.

UNIT 28.6.7: 20 Questions to Ask Yourself before Considering Entrepreneurship

Unit Objectives

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

- List the important questions that every entrepreneur should ask before starting an enterprise

Resources to be Used

- Participant Handbook
- Blank sheets of paper
- Pens

Ask

- Why do you want to become an entrepreneur?

Say

- It is very important to know why you want to become an entrepreneur. Your personal goals for becoming an entrepreneur play a key role in the success of your business. Your goals should be clear well before you start your business.
- Apart from the goals, the other aspects of business that you need to bear in mind are the potential problems that you may face to set-up, your areas of interest, and all the other dimensions of the business.
- Let's understand it better with the help of some questions that every entrepreneur should ask before starting their own business.
- Open the Participant Handbook section named '20 Questions to Ask Yourself Before Considering Entrepreneurship'. You have to answer the questions individually.
- Then, we will have a class discussion on all the questions.

Do

- Read out the questions one by one in front of all the participants.
- Participants have to answer all the one by one questions.
- Give the class 10-15 minutes to note down their answers.
- At the end of 15 minutes, open the discussion for all the questions.
- Moderate the discussion by focusing on the relevant points.

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

Summarize

- Ask the participants what they have learned from this exercise/activity.
- Ask if they have any questions related to what they have talked about so far.





Skill India
कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



29. Annexures

Annexure 1 – Training Delivery Plan

Annexure 2 – Assessment Criteria

Annexure 1

Training Delivery Plan

Training Delivery Plan			
Program Name:	Field Engineer RACW		
Qualification Pack Name & Ref. ID	Field Engineer RACW, ELE/Q3105		
Version No.	V1.0	Version Update Date	24-03-2015
Pre-requisites to Training	8th Standard passed ITI/Diploma (Electrical/Mechanical/RAC)		
Training Outcomes	<p>By the end of this program, the participants will be able to:</p> <ul style="list-style-type: none"> • Introduction and Safety Rules • Theory of RACW • Develop Communication Skills • Develop Soft Skills • Practical -Develop ability in repair of RACW and hands on Practical 		

Sl. No	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/Ads	Duration HH:MM
1	Introduction and Job Responsibilities	Overview of RACW job role	<ul style="list-style-type: none"> Introduction Importance of RACW Trade, Scope of job and Industry overview Safety Work Rules, Safe work environment, use of safety equipment, Service precautions at workshop and at Customer's place 	ELE/N9901 ELE/N3101	Facilitator-led – Discussion Demonstration Power-point presentation Audio-visuals- Images		Theory: 08:00 Practical: 32:00
2	Measurement Systems	Basic electronics	<ul style="list-style-type: none"> Measurement Systems, CGS, MKS, FPS, SI Units, States of Matter, Atomic Structure, Active, Passive Components, Conductors, insulator, Semi-Conductors, Resistance, Capacitance and Inductance, Series and Parallel circuits, Ohm's law, Kirchhoff's Laws, Electrical and Electronic symbols, Transistors, Triacs, MOSFETs, AC, DC Circuits, Earthing, Voltages, Work, Power and Energy, Electrical Consumption, Wastage 	ELE/N8107	Facilitator-led – Discussion Demonstration Power-point presentation	Multi-meter Pressure Gauge Clamp Meter Weighing Scale Temperature meter	Theory: 08:00 Practical: 32:00

			<ul style="list-style-type: none"> Transformers, Motors- AC and DC, Transducers Sensors, Switches, Pressure sensors, Valves, Voltage Flow 				
3	At end to service complaints – washing machine	Introduction to washing machine	<ul style="list-style-type: none"> WM Types- Semi, Fully – Top Loading and front Loading, Uses, Water Flow, Water Pressure, Pulley, belt, solenoid, Clutch, Brake, Timer and other parts and their uses in washing Machine Gears and Mechanism, Working Principle, Process – Wash, Soak, Rinse, Spin 	ELE/N3116	Facilitator-led – Discussion Demonstration	Different types of Washing machine Multi-meter Pressure Gauge Clamp Meter Weighing Scale Temperature meter Spanner Screw Driver set	Theory: 06:00 Practical: 14:00
4	At end to service complaints – Refrigerator	Introduction to Refrigerator	<ul style="list-style-type: none"> Refrigeration types, application, Vapour Compression, Main Components, Heat Exchanger, Heat Flow, Heat and temperature, various temperature scales, Concept of absolute zero, Conduction, Convection, Radiation, Specific, Latent and Sensible Heat, 	ELE/N3115	Facilitator-led – Discussion Demonstration Power-point presentation Audio-Visuals- Images	Different types of Refrigerator Multi-meter Pressure Gauge Electrical Drill Clamp Meter Tube Cutter Tube Bender Vacuum Pump Weighing Scale Gas Cylinder Temperature meter Spanner Screw Driver set	Theory: 06:00 Practical: 14:00

			<p>Pressure, Refrigeration Cycle,</p> <ul style="list-style-type: none"> • Types and uses of a refrigerator, • DC, FF and SBS Refrigerators, Ozone Layer, • Refrigerants, Gases used in Refrigerator, their chemical composition, • CFC and Non-CFC Gases, How a refrigerator works 				
5	<p>At the end of service complaints – AC</p>	<p>Introduction to AC</p>	<ul style="list-style-type: none"> • AC, Types, Refrigeration cycle for AC, • Refrigerants, Lubrication, Oils, Storage • cylinder colour codes, Environment safety, Thermal Properties of Gases, • Boyle's and Charles' Laws, Concept of Ton of Refrigeration, Capacity, • Compressor- Rotary, reciprocating, how they work, why they fail, • Precautions, Condensers, evaporators, • Blowers, Driers, Filters, Relays, Electro mechanical parts, Refrigerants, • BTU, EER, Star Rating, BEE Rating, E-waste, parts of WAC and SAC 	ELE/N3117	<p>Facilitator-led – Discussion Demonstration</p>	<p>Different type of Air conditioner Multimeter Pressure Gauge Electrical Drill Clamp Meter Tube Cutter Tube Bender Vacuum Pump Weighing Scale Gas Cylinder Temperature meter Spanner Screw Driver set</p>	<p>Theory: 06:00 Practical: 14:00</p>

6	Use of Tools	Dish components and assembly	<ul style="list-style-type: none"> • Tools and equipment and hand tools ,use , care , safety, symbols • Use of Mul -meter, Megger, Clamp Meter, Tools required, • Checking of voltages and Current, Wiring Diagram, • Vacuums Pump, Gauge, Digital Weighing Balance, • checking of individual parts • Installa on of SAC, Comfort zone for human, Flaring and Swaging, Brazing, • Flux, • Heat Load, • Installa on of IDU and ODU, • Fixing of wall mount plate, • Choice of pipes' material, • Height of ODU, Site for ODU, U-Trap, Faults and Rec fica on, Gases used in AC, • their chemical composi on, • Leak Test, Flushing, Uses of Nitrogen, • Brazing, • Types of flames, • Material of Brazing Rod, • Reasons for choice of this material, 	ELE/N3112 ELE/N3113 ELE/N3114	Demonstra o n	Mul -meter Pressure Gauge Electrical Drill Clamp Meter Tube Cu er Tube Bender Vacuum Pump Weighing Scale Gas Cylinder Temperatur e meter Spanner Screw Driver set	Theory: 05:00 Prac cal: 10:00
---	--------------	------------------------------	--	-------------------------------------	------------------	--	----------------------------------

			<ul style="list-style-type: none"> quality standards to be followed 				
7	Install newly purchased Refrigerator, WM and AC	Installation of electronic machine	<ul style="list-style-type: none"> Installation of WM, Ref, SAC and WAC, Structural Requirements, Selection of Place, Electricity 	ELE/N3112 ELE/N3113 ELE/N3114	Demonstration	Different type of Air conditioner Different types of Refrigerator Different types of Washing machine	Theory: 08:00 Practical: 14:00
8	Do's and Do Not's	Errors in installation	<ul style="list-style-type: none"> Common mistakes by technicians Faults and Fault-Finding Techniques, Ref, Split and Window AC Faults WM- Dead, No wash, No spin, Vibrations, PCB Faults Ref-Dead, No cooling, Less Cooling, No ice formation, Vibration sound AC-Dead, Stand by, No Cooling, Less Cooling, Extra Sound when on, choking, moisture, low refrigerant, gas leak 	ELE/N3101	Facilitator-led – Discussion Demonstration Power-point presentation Audio-Visuals-Images	Videos, PPT's, Laptop, Projector, Projector Screen, White Board, Marker, Duster, Internet	Theory: 06:00 Practical: 14:00
9	Interact with colleagues	Manners and Etiquettes	<ul style="list-style-type: none"> Manners and Etiquettes, Behavior on phone, Dressing Sense, Personal Hygiene, Presentation Skills, People Skills, Handling difficult people and situations, Avoiding gaudy wear, 	ELE/N9901	Demonstration		Theory: 06:00 Practical: 14:00

			<ul style="list-style-type: none"> • Method of speaking, Language and Tone, • Maintaining distance while speaking, • Body Language 				
						Unique Equipment Required: Different type of Air conditioner Different types of Refrigerator Different types of Washing machine Multimeter Pressure Gauge Electrical Drill Clamp Meter Tube Cutter Tube Bender Vacuum Pump Weighing Scale Gas Cylinder Temperature meter Spanner Screw Driver set	Total duration: Theory- 60.00 Practical - 162.00

Annexure II

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria for " Field Engineer RACW"	
Job Role	Field Engineer RACW
Qualification Pack	ELE/ Q 3105
Sector Skill Council	Electronics Sector Skills Council of India
Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	Each NOS will have assessed both for theoretical knowledge and practical
3	The assessment will be based on knowledge bank of questions created by the SSC.
4	Individual assessment agencies will create unique question papers for theory and skill practical part for each candidate at each examination/training center
5	To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

S.No.	NOS No.	NOS Name	Total Marks	Marks Allocation: Skills	Marks Allocation: Knowledge	Marks Allocation: Behaviour
1.	ELE/N3101	Engage with customer for service	100	60	40	
2.	ELE/N3112	Install newly purchased refrigerator	100	60	40	
3.	ELE/N3113	Attend to service complaints - refrigerator	100	60	40	
4.	ELE/N3114	Install newly purchased air conditioner	100	60	40	
5.	ELE/N3115	Attend to service complaints – Air conditioner	100	60	40	
6.	ELE/N3116	Install newly purchased washing machine	100	60	40	

7.	ELE/N3117	Attend to service complaints – washing machine	100	60	40	
8.	ELE/N9901	Interact with colleagues	100	60	40	
	Total:		800	480	320	
	Percentage Weightage:			60%	40%	
	Minimum Pass% to qualify:			70%	70%	

Do 

- Explain each Guideline for Assessment in detail
- Explain the score that each trainee needs to obtain
- Recapitulate each NOS one-by-one and take participants through the allocation of marks for Theory and Skills Practical.
- Explain the Allocation of Marks. Explain that they will be assessed on Theory and Skills Practical.



Skill India

कौशल भारत - कुशल भारत



सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP



N · S · D · C
National
Skill Development
Corporation

Transforming the skill landscape



Skilling India in Electronics

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

Email : info@essc-india.org

Website : www.essc-india.org

Phone : +91-11-46035050

Price: ₹