

Rajasthan Skill & Livelihoods Development Corporation

1. Module Name	Repair & Maintenance of Photocopier and Fax Machine		
2. Sector	Electronics		
3. Entry Qualification	Minimum 10 th Pass		
4. Minimum Age (in years)	15		
5. Duration	49 days/ 294 hrs.		
6. Provision of Tool kit	Yes		
7. Terminal Competency	<p>After completion of training the trainee will be able to</p> <ul style="list-style-type: none"> • use multimeter; • test active and passive components, transformers and semiconductors; • undertake soldering and de soldering of components; • assemble and test rectifier circuits, amplifier circuits and audio power amplifier; • install and maintain UPS and inverter; • charge and test batteries; • check and maintain power supply; • identify various sensors used in photo copying machine & fax machine; • dismantle and assemble the paper feed mechanism, paper tray, thermal unit and toner units of photo copying machine & fax machine; • identify and repair the faults of photo copying machine & fax machine; and • undertake periodic cleaning and servicing of above machines; 		
Approx. hrs.			
8. Registration, Inauguration, introduction and objectives of the course	2		
9. Course content			
Practical competencies	Approx. hrs.	Underpinning Knowledge (Theory)	Approx. hrs.
• Practice procedure for electrical and personal safety measures.	2	• Electrical and personal safety, dangers and preventions.	1
• Use of multimeter.	2	• Multimeter and its various application.	1
• Testing of active and passive components.	3	• Basics of electricity – define DC, AC// Practical measuring units of voltage, current, resistance. • Types of transformers – its construction, testing.	3
• Testing of transformers.	3	• Testing of proper earth using test lamp.	1

• Testing of semiconductor components.	3	• Testing of earth using multimeter.	2
• Testing of unregulated and regulated voltages.	3	• Fuse – Types, use of fuses and its rating.	2
• Soldering and de-soldering techniques.	6	• Basic Electronics – passive and active components – testing of components, MOSFET – precautions when handling.	3
• Assemble and test rectifier circuits – half wave, full wave & bridge rectifier.	6	• Application of transistor – its uses.	2
• Assemble a power amplifier circuit (common emitter, emitter follower).	9	• Op-Amp – Introduction, applications, constructions, comparators.	2
• Assemble and test an audio power amplifier (buzzer).	9	• Voltage Regulator and their types.	2
• Construct a RC – oscillator and test it.	9	• DIAC, SCR, TRIAC – application.	2
• Find the total load and select a suitable UPS/ Inverter (rating factor).	3	• Digital Electronics – gates and its application, multiplexers, demultiplexers, counter.	3
• Installation of UPS and Inverter.	6	• Electrical load their VA and watts. • Various types of batteries used in UPS and inverters and their maintenance.	3
• Maintenance of Battery.	3	• Single phase and three phase system, different types of inverter, UPS, Working principle, specifications, explanation with the help of block diagram, basic principle of working of power switches, testing methods, discussions of various faults, diagnosing methods, rectifying common faults.	6
• Opening & dismantling an equipment and identifying the major parts, testing of major components, identifying transformers and checking, checking of power modules, Charging, discharging and testing of batteries, repairing of SMPS, simulating various faults diagnosing and rectifying it.	18		
• Practice procedures for safety and health hazard measures.	1	• Electrical and personal safety, dangers and preventions.	1
Photo Copier	0	Photo Copier	0
• Operation of a photo copier.	3	• Principle of photo copying.	1
		• Photo sensitive materials – selenium etc.	1
		• Image transfer methods.	1
• Identify various sensors used in the copier and their fixtures.	2	• Various types of sensors and their functions.	1
• Fault finding and repairing in electrostatic high voltage unit.	2	• Electrostatic charger and charging of drum assembly.	1

<ul style="list-style-type: none"> Dismantling and assembling of paper feed mechanism, paper tray, Thermal unit and Toner unit. Identify the faults and repair in the thermal unit. 	12	<ul style="list-style-type: none"> Paper trays, Paper feed mechanism and the sensors used for paper movement. Toner and its properties. 	1
<ul style="list-style-type: none"> Dismantling and fitting of drum unit – cleaning of drum unit. Dismantling and refitting of Carriage unit, mirror unit and light unit. Fault finding in light unit. 	12	<ul style="list-style-type: none"> Effects of light intensity on charging the drum unit. 	1
		<ul style="list-style-type: none"> Focusing, enlargement methods. 	1
<ul style="list-style-type: none"> Control modules – understand the fault codes and identify the faulty sections. Fault finding in control module. 	9	<ul style="list-style-type: none"> Functions of control module – fault codes. 	1
<ul style="list-style-type: none"> Periodic cleaning and servicing of copier machines. Overall fault finding and repair a photo copier machine. 	6	<ul style="list-style-type: none"> Fault finding methods and procedure for copier machines. 	1
<ul style="list-style-type: none"> Fault finding and repair of Colour copiers. 	3	<ul style="list-style-type: none"> Principle of Colour Copiers. 	1
<ul style="list-style-type: none"> Repairing of Jumbo copiers. Repairing of multipurpose copy printers. Repairing of heavy duty copiers. 	12	<ul style="list-style-type: none"> Multipurpose copy printers and heavy duty copiers. 	1
Fax Machine	0	Fax Machine	0
<ul style="list-style-type: none"> Operation of a Fax machine. 	2	<ul style="list-style-type: none"> Principle of FAX Machine. 	1
<ul style="list-style-type: none"> Telephone line access and phone connection. 	3	<ul style="list-style-type: none"> Properties of telephone line, ISDN line. 	1
		<ul style="list-style-type: none"> Data reception and printing Checksum and its importance. 	1
		<ul style="list-style-type: none"> Scanning of paper and converting to data. 	1
<ul style="list-style-type: none"> Thermal printers and ink printers. 	3	<ul style="list-style-type: none"> Printers thermal and ink, their working principles. 	1
<ul style="list-style-type: none"> Dismantling and assembling of paper feed mechanism, paper tray, thermal unit and Toner Unit of Fax Machine. Identify various sensors used in the Fax machines. 	12	<ul style="list-style-type: none"> Paper trays, Paper feed mechanism and the sensors used for paper movement. 	1
<ul style="list-style-type: none"> Control modules – understand the fault codes and identify the faulty sections. Fault finding in control module. 	12	<ul style="list-style-type: none"> Functions of control module – fault codes. 	1
<ul style="list-style-type: none"> Identify the faults and repair in the thermal printer unit. 	6	<ul style="list-style-type: none"> Fault finding methods and procedure for Fax machines. 	1

• Periodic cleaning and servicing of fax machines.	3	Entrepreneurship & Soft Skills and Computer Literacy Module:	0
		• Entrepreneurship – its necessity and charms of being an entrepreneur.	1
		• Who is an entrepreneur and characteristics of a successful Entrepreneur?	2
		• How to identify Business opportunities?	2
		• Steps for setting up a small scale venture.	1
		• Institutional support for entrepreneurship (whom to contact for what)	2
		• Government (Central/ State) Schemes and assistance from Banks/ other financial institutions - Procedures and formalities for getting loan.	2
		• How to prepare Business plan?	2
		• Financial literacy-Costing, Pricing, Profitability and Break Even Analysis.	2
		• Cash management in small enterprises.	2
		• Accounting and Book Keeping	2
		• Introduction to Taxation	1
		• Shop and Establishment Act and its provisions.	1
		• Creativity, Problem solving & decision making.	1
		• Common mistakes generally made by entrepreneurs.	1
		• Interaction with successful entrepreneur and success stories.	2
		• Communication and Negotiation skills.	1
		• Interpersonal skills	1
		• How to Deal with customer attitude – Effective selling.	1
		• Marketing – Basic concepts/ Skills and effective mode of advertising.	1
		• Introduction to e-commerce.	2
Computer Fundamentals Customize the Desktop Environment e.g. Desktop, Start Menu, and Taskbar etc. Configuring & Migrating Files, Folders & Settings - Folder Views, Accessibility Settings	2	Computer Fundamentals, MS-Office & Internet introduction to Computers History of Computers Components of Hardware Peripherals	1

MS Word Creating, Organizing & Formatting Content Collaborating – Merge, Insert, View, Edit, Track Mode etc. Formatting & Managing Documents	4	Concept of Operating System – Windows XP, Exploring & Configuring the Windows XP Desktop Environment-Customize the Desktop, Start Menu, and Taskbar etc. Configuring & Migrating Files, Folders	1
MS Excel Creating, Analyzing & Formatting Data & Content Collaborating - Insert, View, Edit etc. Managing Workbooks	3	Settings - Folder Views, Accessibility Settings Features of Windows XP Understanding concepts of Word processing using MS-Word Understanding concepts of Electronic spreadsheet and various types of entries in it	1
MS PowerPoint Creating & Formatting Content Collaborating - Track, Edit, Add, Delete Comments, Merge Managing & Delivering Presentations	3		
Internet Concepts Opening websites and downloading data Writing, reading and sending emails	4	Understanding concepts of URL Creating and Opening an E-mail account. Receiving and sending emails Searching information on Internet.	1
Approx. Total Practical hours	204	Approx. Total Theory hours	88
Grand Total (2+204+88)			294

10. Tools, Equipments and Material for a batch of 30 trainees		
S.No.	Item	Quantity
1	Inverter / UPS Trainer	1
2	Battery Charger	1
3	Technicians tool kit comprising of all tools required in repair and maintenance of Basic electronic items	6
4	Digital multi-meter	6
5	Soldering / De-soldering temp controlled station	6
6	Clip on ammeter	6
7	Soldering gun	6
8	De-soldering Pump	6
9	SMD Soldering tools	6
10	Antistatic mat with proper grounding and wrist band	As required
11	Photo Copier (mono)	2
12	Photo Copier Colour	1
13	Copy Printer	2
14	Jumbo copier	1
15	Fax machine	3
16	High voltage test unit	3
17	Multimeter	6
18	Tool kit	6

S.No.	Item	Quantity	S.No.	Item	Quantity
	Hardware			Software:	
1	Computers/Laptops	10 (one for three trainee)	6	Microsoft Windows 7/8/10 or UNIX/ LINUX or latest software	For all Systems
2	Power backup	For all Systems	7	Microsoft Office 2007/ 2010/ 2013 or latest software	For all Systems
3	Inkjet/Laser Printer (Network/USB Printer)	1	8	Antivirus Software (TVD/ Norton/ Quick Heal Total Security/ Kaspersky/ Any Popular brand)	For all Systems
4	Speaker	1	9	Internet Connection	For all Systems
5	Spare H/W components	As per requirement			