

Advanced Diploma in Computer Hardware & Networking

1. **Name: Advanced Diploma in Computer Hardware & Networking.**
2. **Entry Qualification:** Minimum 10th Std. & 14 years and Above.
3. **Terminal Competency:** After completion of the training, participants would be able to: Assembling computers & installing the peripheral devices Repair computers up to card level. Install different software on computers. After completion of the training, participants would be able to: Interconnect computers using switch and establish peer-to- peer, client-server connection Create user"s groups and allocate rights and privileges
4. **Duration: 12 Months**
5. **Contents:** Given below:

Computer Hardware	
Practical Competencies	Underpinning Knowledge (Theory)
<p>-Identification and using different input-output devices ,cords, cables,connectors and input-output devices.</p> <p>-Practice of using Keyboard and mouse. Booting computer in DOS and Windows environment. Identifying different error messages</p> <p>-Identifying and Practising all the hardware tools. Using FDD & CD Lens cleaning kits. Using cleaning solutions like isopropyl alcohol & carbon tetra chloride. Using all the relevant tools. Soldering and de-soldering. Hands-on practice of using the utility programs. Using hardware-troubleshooting software.</p> <p>-Identification (type, value, package, polarity) and testing of resistors, capacitors, diodes, transistors/ Study of suitability of place for computer installation and preparing the site as per specification.</p> <p>-To identify different Motherboards, Controller Cards, Display cards and Sound cards, AGPs, Fax/Modem card, TV Tuner card, Ethernet card</p> <p>-Identification of different processors, their pins. Testing and replacing the processors. Understanding coding on the processors</p>	<p>Computer Basics</p> <p>Block Diagram of a Computer System.</p> <p>Storage Devices - Magnetic tape, Floppy Disk, Hard Disk & CD ROM. Booting the computer Storage & retrieval of data Types of software System software & Application software. Functions of operating system, interpreter compiler and assembler</p> <p>Basic Tools (Hardware & Software) Straight slot screwdrivers,. Phillips & Torx screwdrivers, Hex nut driver, combination pliers, nose-pliers, chip inserters and extractors, flash light, tweezers, wire cutter and stripper, soldering iron, de-soldering pump, vacuum cleaner, brush ,crimping tool etc. FDD cleaning kits, CD drives lens cleaning kit, isopropyl alcohol, etc. DOS & Windows bootable, FDISK, FORMAT, SYS, SCAN DISK, MSD, MSCDEX, Disk Manager, Norton Utilities, DOS & Windows installable, hardware troubleshooting software</p> <p>Basic electronic components. Significance of current, voltage, power, resistance and capacitance. Principle of resistors, capacitors,</p>

<p>-Installing and upgrading memory. Identification of memory slots and memory chips. Testing the memory slots and chips</p> <p>-Checking and replacing motherboards. Installing CPU and memory on Motherboards. Checking and replacing BIOS and Battery</p> <p>-Checking the fuse, checking output voltage, connecting to Motherboard and other devices. Installing and replacing the power supply. Installation of Display cards, Super IDE card, SCSI card etc. Installation and configuration of Sound card, Modem, TV tuner card and Ethernet card. Checking and configuring ports.</p> <p>-Installing and connecting the HDD, configuring as master and slave. Using software tools like Scandisk, FDISK, Norton Utilities, Disk Manager etc. to partition, format surface scan and to mark the bad blocks. Low-level formatting.</p> <p>Connecting and configuring drives, checking, and replacing cables, cleaning the heads, changing the sensors, identifying and rectifying floppy drive problems</p> <p>-Installing and loading the drivers. Configuring as master and slaves. Cleaning lens of CD Drives writer, DVDs and cleaning head of CTDs. Hands-on practice of checking and replacing the keyboard cable and KB switches. Servicing the keyboard.</p> <p>-Configuring and optimizing the CMOS set-up.</p> <p>-Servicing of monitors, changing fuses, adjusting colors, brightness and contrast. Setting resolution, loading drivers. Checking and replacing components on the PCB. Checking and adjusting LCD Monitors.</p> <p>-Configuring and servicing the printers, Self-test, checking printer cables and ports. Loading the drivers and managing the output.</p>	<p>diode, zener diode, LEDs and transistors. Site Preparation. Layout of PCs, printers etc., Air-conditioning requirements, Power supply requirements & layout, false roofing, flooring, Line-conditioning equipment and positioning of exhaust fans</p> <p>Types of cards used in computer system. Motherboards, Controller Cards, Display cards and Sound cards, AGPs, Fax/Modem card, TV Tuner card, Ethernet card</p> <p>Types of Interfaces/Connectors. FDD connectors, IDE & SCSI Interface, Serial (COM) ports, Parallel (LPT) ports, USB connector, Keyboard and PS/2 connectors.</p> <p>Types of Processors. Main features, package, voltage, clock speed, Study of different types of Pentium processors.</p> <p>Types of Memory. Different types of Memory used in PCs. Installing and upgrading memory. L1 and L2 cache memory</p> <p>Motherboard (Installation, Configuration & Troubleshooting) Types of Motherboards, Motherboards with different sockets and slots. Jumper settings, DIP switch settings. Installing the processors and memory on MB. Checking MB BIOS. Checking and connecting external battery. On-board features. Installing, checking and replacing Motherboards</p> <p>Power Supply (Installation & Troubleshooting) Different types of SMPS (AT & ATX), <i>Expansion cards (Installation, configuration & troubleshooting).</i> Study of different types of Cards.</p> <p>Hard Disk drives (Installation and configuration). Types of HDD (IDE & SCSI), Installing and connecting HDD, configuring HDD as master and slave, checking media, partitioning, formatting and making HDD bootable.</p>
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-Installation of DOS & Windows operating systems. Loading and configuring the device drivers. Identifying viruses and using anti-virus programmes to scan and remove different type of viruses Identify components of a simple LAN environment, to identify different types of cables used for networking, to identify the protocols installed in an existing LAN setup, m, Identify the NIC installed & MAC address, installation of NIC card.

-Make UTP cross cable and testing using continuity tester. Establish connection between two computers using a cross cable

-Make a UTP straight patch cord and testing using continuity tester. Connect and test a straight cable using a N-port switch and computers. Establish a peer-to-peer connection. Configure a router Add/ Delete entries in configuration task. Create work groups.

-Set IP address and subnet mask. Establish connection. Use of Ping command. Establish sub networks using subnet mask. Share resources in LAN. Fault find and troubleshoot network problems

-Making of preventive maintenance plan, taking backups using MSBACKUP and other third party tools. Fine-tuning and optimizing the system.

Floppy Drives (Installation and Maintenance).

Types of FDDs, connections of floppy drives, cleaning drive head

CD ROM Drive, DVD & CTD (Installation and Maintenance)

Types of CD Drives, DVDs, data storage and retrieval on CDs, DVDs & CTDs. Connecting and configuring the drives. Maintenance of CDs, DVDs & CTDs. Installation and working of CD Writer

Keyboard servicing and CMOS Setup

Types and working of keyboards. Checking and replacing the keyboard cable and KB switches. Servicing the keyboard.

Monitors (Servicing & Maintenance).

Types of monitors (Mono & Color), Block diagram, CRT, checking the fuses, Adjusting contrast and brightness. LCD Monitors.

Printers (Troubleshooting & Maintenance)

Types and working of different printers (DMP, DeskJet and LaserJet). Checking the interface and cables, setting the DIP switches, self test & servicing the printers. Loading the drivers.

Assembling & Dismantling of PCs and Front panel connections.

Software Installation & Virus Protection

Installation and configuration of DOS and Windows operating systems. Installation of Device drivers. Types of viruses, their symptoms, identification, protection and removal.

Serial data communication, principle, standards /protocols and devices/ applications.

Parallel data communication, principle, standards/protocols and devices/ applications.

Features of Networked computers, Components required for networking, Network Topologies.

Comparison. Network Protocols, applications, Physical components planning for a small LAN.

Network operating systems and features.

Network cables, types, specifications, standards, application. Peer – to – peer connection. Client – server connection, comparison, applications.

What is router, its function, configuration table,

Concept of work groups and uses. UTP Cross cable for testing connection between two computers

Preventive Maintenance.

Cleaning the equipment, servicing the equipment,

	Types of Backup, taking backups and fine-tuning the system,
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Networking	
Practical Competencies	Underpinning Knowledge (Theory)
<p>Computer parts and peripherals - Identify the controls of each of these devices including the system (CPU) unit.</p> <p>Practice windows operating system. Identify system specifications.</p> <p>Identify physically devices interfaces installed with a PC, Check status of installed devices using system information and device manager.</p> <p>Practice facilities provided by the device manager.</p> <p>Install a new device (internal/external) to the PC and carryout necessary setting.</p> <p>Identify components of a simple LAN environment.</p> <p>Identify different types of cables used for networking.</p> <p>Identify the protocols installed in an existing LAN setup, Draw LAN diagram, Identify the NIC installed & MAC address ,Install of NIC card.</p> <p>Make UTP cross cable and testing using continuity tester. Establish connection between two computers using a cross cable</p> <p>Make a UTP straight patch cord and testing using continuity tester. Connect and test a straight cable using a N-port switch and computers. Establish a peer-to-peer connection. Configure a router Add/ Delete entries in configuration task. Create work groups.</p> <p>Set IP address and subnet mask. Establish connection. Use of Ping command. Establish sub networks using subnet mask. Share resources in LAN. Fault find and troubleshoot network problems. Trace a network route. Create users, allocate rights and testing. Implement security in LAN. Use Linux commands. Install and uninstall devices using Linux command. Set-up LAN under Linux</p>	<p>Basic blocks of a digital computer. Function of each block. Personal computer organization. Introduction to various generations of PC's. Brief working and usage of I/O and memory devices used in a PC.</p> <p>Working with computer using windows operating system, Interfacing I/O device to motherboard. Need and function of driver. Identifying devices installed in the PC. Enabling, disabling, refreshing, checking properties of devices installed. Installing new devices, setting and testing</p> <p>Serial data communication, principle, standards/protocols and devices/ applications.</p> <p>Parallel data communication, principle, standards/protocols and devices/ applications.</p> <p>Features of Networked computers, Components required for networking, Network Topologies. Comparison. Network Protocols, applications, Physical components planning for a small LAN. Network operating systems and features.</p> <p>Network cables, types, specifications, standards, application. Peer – to – peer connection. Client – server connection, comparison, applications.</p> <p>What is router, its function, configuration table. Concept of work groups and uses. UTP Cross cable for testing connection between two computers.</p> <p>UTP straight cable and connecting through N-port Switch. Allocation of IP address and Subnet mask. Cabling procedures and introduction to structured cabling. Resource sharing in LAN environment. Creating users in Widows server. Resource sharing and Security. Sharing a single internet connection in LAN, with or without the use of Proxy. Multi user OS</p>