



PROGRAMME GUIDE

2024-25



PROGRAM-GUIDE

ADVANCED DIPLOMA IN COMPUTER HARDWARE AND NETWORKING (ADCHN)

- Scheme of Examination
- Detailed Syllabus
- Counseling and Study Structure
- Study Modules & Books Information

Supported By



CONTENT

S.NO.	PROGRAMME NAME	PAGES
1	ADVANCE DIPLOMA IN COMPUTER HARDWARE AND NETWORKING (ADCHN)	01
2	DIPLOMA IN ELECTRICAL TECHNICIAN (DET)	16
3	DIPLOMA IN REFRIGERATION AND AIR-CONDITIONING (DRA)	28
4	DIPLOMA IN IT HARDWARE SERVICE AND TECHNOLOGY SUPPORT (DIHSTS)	39
5	CERTIFICATE FOR TV REPAIR TECHNICIAN (CTRT)	51
6	CERTIFICATE IN COMPUTER HARDWARE ENGINEERING (CCHE)	62
7	CERTIFICATE IN MOTOR AND TRANSFORMER WINDING (CMTW)	74
8	CERTIFICATE IN ADVANCE NETWORKING (CAN)	81
9	CERTIFICATION IN HOUSE WIRING (CHW)	91
10	CERTIFICATE IN NETWORKING TECHNOLOGY (CNT)	98
11	CERTIFICATE FOR DTH INSTALLER & SERVICE TECHNICIAN (CDIST)	106
12	CERTIFICATE IN LAPTOP REPAIRING (CLR)	112
13	CERTIFICATE IN ASSEMBLY OF PC (CAP)	119

**ADVANCE DIPLOMA IN
COMPUTER HARDWARE AND
NETWORKING (ADCHN)**

Advance Diploma in Computer Hardware and Networking (ADCHN)

, Mdk fMyk bu dE; Wj gkM s j , . M uVofdz (ADCHN)

(A) Duration : 12 Months
1/2 vof/k : 12 elg

(D) Courses : 13
1/2 dk 1 : 13

(B) Eligibility : 12th Pass
1/2 ik-rk : 12ohai k

(E) Credit : 32
1/2 ØfMV : 32

(C) Contents and Scheme of Examination

1/2 ikB; Øe fo" k l ph , oaijh k ; k uk

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
Semester I										
ADCHN1	Fundamental of Computers and Information Technology सूचना तकनीक एवं कम्प्यूटर से परिचय	2	100	70	28	-	-	30	12	<ul style="list-style-type: none">Understand the functions, characteristics & basic components of a computer system and Operating System.Know-how of various peripherals, storage devices & understand their physical structure & working.
ADCHN2	Safety Practices in the Work Environment कार्यस्थल पर सुरक्षा प्रबन्ध	1	100	50	20	20	8	30	12	<ul style="list-style-type: none">Familiarity with safety, fire safety, first aid, food safety, primary health and basic hygiene
ADCHN3	Assembly of PC पी.सी. की असेम्बली	2	100	50	20	20	8	30	12	<ul style="list-style-type: none">Understand basic parts/ modules of computer.Demonstrate assemble / de-assemble procedure of computer.Basic fault diagnosis.
ADCHN4	PC Installation and Maintenance पी.सी. इन्सटालेशन एण्ड मेंटेनेंस	2	100	50	20	20	8	30	12	<ul style="list-style-type: none">Understand installation process of operating system.Understand hard disk partitioning fundamentals.Understand and demonstrate software installation and removal.
ADCHN5	Basic and Digital Electronics बेसिक एवं डिजिटल इलेक्ट्रॉनिक्स	2	100	50	20	20	8	30	12	<ul style="list-style-type: none">Understand basics of electronics and electronic devices with their function and characteristic.Identify various types of circuit boards and component mounting processUsing analog and digital testing tools.
ADCHN6	Computer Hardware Maintenance कम्प्यूटर हार्डवेयर मेंटेनेंस	3	100	50	20	20	8	30	12	<ul style="list-style-type: none">Understand function and installation of various I/O devicesUse and installation of power supporting devices

ADCHN7	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	1	100	70	28	-	-	30	12	<ul style="list-style-type: none"> • Basic communication skills • Personality • rooming
Semester II										
ADCHN8	Networking Fundamentals नेटवर्किंग फंडामेंटल्स	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> • Narrate network concepts and terminology • Identify, install and configure network components • Identify and learn about hardware components for a peer-to-peer network • Understand installation of network printers.
ADCHN9	Windows NT Server Management विन्डोज एन.टी. सर्वर मैनेजमेंट	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> • Understand know-how to install and configure a Windows system as a server especially as a File Server, Web Server using Windows NT server. • Setup LAN using Windows NT server • Understand basic server maintenance task.
ADCHN10	Windows 2000 & 2003 Server Management विन्डोज 2000 एवं 2003 सर्वर मैनेजमेंट	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> • Understand know-how to install and configure a Windows system as a server especially as a File Server, Web Server. • Setup LAN using Windows 2000/2003 server • Understand basic server maintenance task.
ADCHN11	Linux & Installation लाइनेक्स एण्ड इंस्टालेशन	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> • Understand know-how to install and configure a Linux system as a server especially as a Web Server, mail server, DNS, Proxy and Samba server. • Setup LAN using Linux server Operating System. • Understand basic server maintenance task.
ADCHN12	Introduction to Entrepreneurship उद्यमिता से परिचय	2	100	70	28	-	-	30	12	<ul style="list-style-type: none"> • Understanding of entrepreneurship development concepts
ADCHN13	Project प्रोजेक्ट	7	-	-	-	100	40	-	-	<ul style="list-style-type: none"> • On the job skill by working with a hardware maintenance establishment company. • Experience of PC assembly and maintenance of computer. • Experience of setting up a LAN in office/organization/institute to disseminate information/app/internet services within organization.

Note : For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
1300	520

Detailed Syllabus

ADCHN1 - FUNDAMENTAL OF COMPUTERS AND INFORMATION TECHNOLOGY

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic components of a computer system - Control unit, detailed functions of ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

Input/Output & Storage Units:-Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers& types – Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, SIMM, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk, Blue Ray Disc, SD/MMC Memory cards, Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW.

Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux, File Allocation Table (FAT & FAT 32), NTFS files & directory structure and its naming rules, booting process details of DOS and Windows, DOS system files Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention, viruses on network.

Use of communication and IT, Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band, Types of Network - LAN, WAN, MAN, Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways.

ADCHN 2 - SAFETY PRACTICES IN THE WORK ENVIRONMENT

Safety Signs & Colour at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Colour- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, first aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, First-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting, Manual lifting techniques using kinetic method, shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled

extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure: Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work: Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene: Introduction, how to maintain good hygiene, how to ensure food safety, Grooming, what are the consequences of not maintaining good hygiene?

Public and Home Safety: Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing, Food safety in the home, Food borne diseases.

ADCHN 3 - ASSEMBLY OF PC

- Introduction of Assembling & Disassembling.
- Difference between branded and assembled computer.
- Components required for Assembling & Disassembling a PC.
- Detail of components required for Assembling & Disassembling a PC.
- Tools used for assembling. & disassembling.
- Steps for Assembling a PC.
- Install the power supply and check it.
- Install the components on motherboard - CPU, Heat sink / fan assembly, RAM.
- Install the motherboard.
- Install internal drive-Hard Disk.
- Install drives in external ways- Optical Drive and Floppy Drive.
- Install adapter Cards- NIC, Video adapter & Sound.
- Connect all internal cables - Power cables and Data cables.
- Connect all front panel indicators, switches and cables.
- Close the cabinet.
- Connect all peripherals – Keyboard, Mouse, Monitor, Speaker, Printer, etc.
- Steps for Disassembling a PC.
- Precautions used while Assembling & Disassembling a PC.
- Final check before Booting.
- Testing –Boot Computer for the first time, identify beep codes and BIOS setup.
- Troubleshooting.

ADCHN4 - PC INSTALLATION AND MAINTENANCE

Installation:

- Operating System Basics.
- Basic concepts of operating systems- Desktop, Network, Server.

- Determine minimum hardware requirements and compatibility with the OS
- Characteristics of modern operating systems.
- Booting of system from DOS/Windows
- Fundamentals of Hard Disk Partitioning and Formatting Hard Disk using F-disk/ Disk Manager
- Using desktop operating system (DOS/ Windows).
- Identify applications and environments that are compatible with an operating system
- Installation of operating system, Installation of Multiple Booting (Win-98, Win-XP, VISTA Media Center, Win-7 O.S)
- Installation of Different Drivers (Sound, display, USB Devices, Printer, Scanner, Web Camera, TV Tuner Card, Modem, Modem Setting)
- Importance of rebooting
- Installation of Application Software, (MS OFFICE 2003/MS OFFICE 2007, Visual Studio, Java, Auto Cad etc)
- Installation of DTP Software (Photoshop, Corel, PageMaker, etc.)
- Installation of Media Players (Adobe Flash Player, Real Player, Jet Audio, Power DVD)
- Installation of Nero and Other Optical Disk Writer.
- Installation of Anti-Virus, Scan Virus File & Folder, Repair Virus File & Folder.
- Create a Rescue Disk,
- Installation of Acrobat Reader, WinZip, Win-RAR etc.

Maintenance:

- Identify and apply common preventive maintenance techniques for operating systems
- Create a preventive maintenance plan
- Schedule a task- Taking Backup of data and Restore the backup in the hard drive
- Updating of antivirus patches
- Troubleshoot operating systems- Review the troubleshooting process, Identify common problems and solutions
- Use of Control Panel.
 - Desktop Customization.
 - Managing User Accounts and Application.
 - Disk Management.
 - Disk Cleanup and Disk Defragmentation Utility.
 - Device Manager.
 - Bit Locker.
 - Windows Firewall Setting.
 - Recovery and Backup.
 - Policies and Services.
 - Network Setting.
 - File and Folder Sharing.
 - Resources Sharing.
 - Services Sharing.

- Remote Desktop.
- Remote Assistance.
- Use of System Tools

ADCHN 5 - BASIC AND DIGITAL ELECTRONICS

Conductors – definition, properties of conductors, uses of conductors; Insulators – definition, properties of insulators, uses of insulators.

Semiconductors – atomic structure of semiconductors, types of semiconductors - N-type semiconductor, P-type semiconductor, PN junction

Active Components – transistor, diodes, silicon controlled rectifier (SCR), diac, triac, bridge rectifier or diode bridge, uni-junction transistor (UJT), field effect transistor (FET)

PN Junction Diodes – PN junction, biasing the PN junction-forward bias & reverse bias, V-I characteristics of PN junction, application of diodes, diode equivalent, classification of diodes, types of diode packaging; Diode Valve – diode valve, cathode, anode

Rectifiers – purpose of a rectifier, half wave rectifier, full wave rectifier, bridge rectifier, comparison of half wave, full wave and bridge rectifiers

Filter Circuits – introduction, types of filter circuits-capacitor filter, RC filter, series inductor filter, choke input LC filter, PI-filter (p filter)

Zener Diode – introduction, VI characteristics of a zener diode, avalanche break down, zener break down, specifications of zener diodes, applications of zener diode

Relays – relay, types of relays-electromagnetic relays, current sensing relay, under-current relay, voltage sensing relay, latching relays, mechanical reset relays, electrical reset relays, reed relays, dry reed relay, ferreed relay mercury wetted contact relay, impulse relay, clapper type armature relay, thermal relay, Poles and contacts, AC relay, Causes of relay failures

Digital system – introduction and examples, ; Terminology of digital ICs; Types of IC packages-dual in line package (DIP), ceramic flat package, surface mount package, ceramic chip carrier package, pin grid array package; Logic family-TTL logic family, emitter-coupled logic (ECL) circuits, MOS, CMOS; Digital IC numbering system

Number Systems – introduction, potential notation and weightage, decimal to binary conversion, counting binary number, hexadecimal number system, hexadecimal number system, octal number, invalid code, inverters (NOT gate), transistor inverter

Logic Probe – introduction, malfunctioning in the internal circuitry, logic probe using inverters, ones complement circuit using inverters

OR Gate – systematic symbol and truth table, electrical equivalent circuit, 2-input OR gate using diode, simple applications of OR gate; NOR Gate - systematic symbol and truth table

Flip Flop – introduction, R-S latch (reset-set latch), timing diagram, as table multivibrator using NOR gates

AND Gates : Introduction of AND gate and its truth table, Electrical equivalent circuit of an AND gate, AND gate as an enable / inhibit device; NAND Gate : Introduction of NAND gate and its truth table, Pulsed operation, Logic pulser.

EX-OR Gate : Exclusive – OR gate, Four input EX-OR gate, Parity; EX-NOR Gate : Introduction, Ex-OR gate as a two-bit adder, Exclusive – OR gate using discrete gates, Application.

Flip Flop : Introduction, RS flip flops, NOR latch, NAND latch, Clocked RS flip flop, D flip flop, Contact bounce circuit, Bounceless switch, Clocked D flip flop, Edge triggering versus level clocking, Edge triggered D flip flop, Variable, Complements, Literal, Boolean addition, Boolean multiplication, Laws of Boolean algebra-commutative law, associative law and distributive law, Boolean algebra rules, De-morgan's theorem, Simplification of Boolean equation, Simplification of logic circuit using Boolean function, Universal property of NOR gate and NAND gate

J. K. Flip Flop Circuits : Operation of J. K. flip flop, Truth table, Master slave flip flop, Frequency division using flip flop

Shift Registers and Their Applications : Introduction to shift registers, Types of registers

BCD Decoders and Their Applications : Cascaded counters, DM7490 decade counter, Decoder – the 4 bit decoder, BCD to decimal decoder, 7441 BCD to 7 segment decoder/driver, Lamp test, Zero suppression, 7-Segment display, LED display, LCD display

Binary Arithmetic : Binary addition, Signed numbers-sign-magnitude system, 1's complement system, 2's complement system, Binary adder-half adder, full adder, , Four bit parallel adder, 74LS83 4 bit parallel adder, Binary subtraction, Adder-subtractor

Multiplexer : Introduction, basic representation and truth table, 8-line multiplexer, Demultiplexer - explanation, 8-line demultiplexer, Application of multiplexers and demultiplexers

Analog to Digital Converter : Introduction, Successive-approximation A/D converter, Analogue to digital converter ADC0808/0809 8 bit microprocessor compatible A/D converter

Interfacing the Digital and Analog Signals : Digital and analog signals, Digital to analog converter, CD player-an example of D to A converter, R/2R ladder digital to analog converter, Performance characteristics of digital to analog converter, DAC 0808 digital to analog converter, Grounding and bypassing

Simple Interruption Counter : Circuit diagram of interruption counter, Explanation of circuit diagram

Multiplexed Displays : Multiplexing, Multiplexing of four digit display

Encoder : Block diagram, truth table and circuit

Priority Encoder : 4:2 Bits priority encoder, 8:3 Bits priority encoder, A hierarchical priority encoder, Encoder applications-keyboard encoders, positional encoders, interrupt requests

Printed Circuit Boards : Etching, Drilling holes on PCBs, Preparing and marking component layout, Mounting components on PCB, Preparation of components leads, Shaping the component leads, Source of stress on components, Stress relief measures, Bending and trimming excess lead length for soldering, Order of soldering components

ADCHN 6 – COMPUTER HARDWARE MAINTENANCE (CHM)

- Personal Computer Components
 - Introduction to Computer, Components of Computer, Difference between Hardware & Software components, Classification of Hardware components, Functional Unit of Computer (Input Unit, Output Unit, Processing Unit, Storage Unit, Infrastructure Unit), Uses and Devices of all functional units.
- Microprocessor
 - Introduction, Working of Microprocessor, Organization of Microprocessor, Generation of Microprocessor, Types of Microprocessor (P-I, P-II, P-III, P-IV & Celeron, AMD, HT-Supported CPU, Normal CPU, Mobile CPU, Centrino CPU, Dual Core CPU, Quad Core CPU, Core i3, core i5, core i7, etc), Indent the Microprocessor (Clock Speed, FSB, L2 Cache), Operating voltage of Microprocessor, Microprocessor Speed, Microprocessor Packaging, Installation of Microprocessor, Upgrading the Microprocessor, Microprocessor Troubleshooting.
- Memory
 - Introduction, Nature of Memory (Volatile Memory and Non-Volatile Memory), Classification of Memory (Physical, Virtual, Logical, Flash, Cache), Types of Physical Memory (RAM, SRAM, DRAM, DR-1 RAM, DR-2 RAM, DR-3 RAM, ROM, PROM, EPROM, EEPROM, CD, DVD, BD, etc), Difference between types of memory, Identify types of memory, Memory Packaging, Installation of Memory, Memory Troubleshooting.
- Motherboard

- Introduction, Types of Motherboard (Integrated Motherboard, Non-Integrated Motherboard), Form Factor of Motherboard (AT Motherboard, ATX Motherboard), Motherboard Components (Slots, Sockets, Ports, Connectors, Chipsets, Busses), Uses of Busses, Bus Standards, Uses of Chipsets, Types of Chipsets (North bridge, South bridge, Super I/O Chip, Audio Codec Chip etc.), Types of Ports (PS/2, USB, Fire wire IEEE-1394, Serial, Parallel, LPT, VGA, HDMI, RJ-45, RJ-11, etc.), Types of Slots (SIMM, DIMM etc.), Types of Socket (PGA, LGA etc.), Types of connectors (SATA, IDE, Floppy Disk, CPU Fan, Jumper, Power connector etc.)
- HARDDISK
 - Introduction, Types of Hard disk (SATA, PATA, SCSI, SSD, e-SATA, Wireless Hard disk etc.), Difference between types of hard disk, Components of Hard disk, Partition of Hard disk (Primary and Logical), Formatting of Hard disk (High Level and Low Level Formatting), Hard disk Troubleshooting.
- SMPS
 - Introduction, Components of SMPS, Working of SMPS, Output Voltages of SMPS, Control signal of SMPS, Power connectors of SMPS, Form Factor of SMPS, Factor considering before selecting a SMPS, Installation of SMPS, Troubleshooting of SMPS.
- OPTICAL DISK
 - Introduction, Types of Optical Disk (CD, DVD, BD), Types of Optical Disk Drive, Types of CD/ DVD/ BD (CD-ROM, CD-R, DVD-ROM, DVD-R, DVD-RW, BD-R, BD-RW), Layers of Optical Disk, Components of Optical Disk Drive, Working of Optical Disk Drive, Installation of Optical Disk Drive, Troubleshooting of Optical Disk Drive.
- KEYBOARD & MOUSE
 - Working of Keyboard, Types of Keyboard (Windows, Ergonomic, Programmable, Multimedia, Cordless, Bluetooth, etc.), Types of Keyboard Keypads (Alphanumeric, Punctuation, Navigation, Windows, Function, Numeric, Modification, Special), Keyboard Technology, Keyboard Connectors, Troubleshooting of Keyboard.
 - Mouse, Types of Mouse (Optical, Laser, Cordless, Bluetooth), Mouse Connectors, Working of Mouse, Troubleshooting of Mouse.
- PRINTER
 - Introduction, Difference between Impact and Non-Impact Printers, identify different parts of Printers, Working of Dot Matrix Printer, Working of Inkjet Printer, Working of Laser Printer, Working of Thermal Printer, All-in-One Printer, Printer Installation, Troubleshooting the Printers.
- SCANNER
 - Introduction, Types of Scanners (Flatbed, Sheet-fed, Slide, Drum), Parts of Scanners, Working of Scanners, Installation of Scanner, Scanner Configuration, Scanner Troubleshooting.
- MONITOR
 - Introduction of Monitor, Types of Monitor (CRT, LCD, TFT, LED, Plasma etc.), Types of CRT Monitors-(Monochrome Monitor, Gray-Scale Monitor, Color Monitor), Block diagram of Monitors, Features of Monitor (Size, Resolution, Contrast Ratio), Monitor Settings (Brightness, Contrast, Horizontal Size, Vertical Size, Horizontal Position, Vertical Position, Degauss, Language, Corner/Trapezoid Correction, Pots), Connectors (VGA, DVI, S-Video, HDMI), Monitor Installation, Monitor Testing, Features of Video Adapter, Components of Video Adapter, Types of Display Cards (AGP, PCI, PCI-e), TV Tuner Card, Video Capture Card, Video Adapter Installation, Projector, Monitor Troubleshooting.
- UPS

- Introduction of UPS, Relay switch, Transformer Working, Fundamental of UPS & UPS Block Diagram, AVR Stage, Voltage Regulator Stage, Charger Stage, Oscillator Stage, Switching Stage, AC low & High Sensor stage, AC/DC Selector Stage, Battery Low Stage, battery deep discharge protection stage.
- BIOS
 - Introduction, Difference between Software and Firmware, BIOS Manufacturing (AMI, Award, MR BIOS, Phoenix Technology), Accessing the BIOS, BIOS functions, BIOS Packaging (DIP, PLCC), CMOS Setup, BIOS Setup Utility, Controlling Option of BIOS Setup, Updating the BIOS, Clearing the CMOS.
- SERVER HARDWARE
 - Introduction, Difference between Server and PC, Server Hard disk - SCSI, Server RAM - RDRAM, Server Microprocessor - Xeon etc, Components of Servers, Types of Servers (Entry level, Middle Range and High End), Hot swappable Devices, RAID Controller, Troubleshooting of Server PC.

ADCHN 7 – COMMUNICATION AND PERSONALITY DEVELOPMENT

Grammar:

Parts of Speech, - Articles and Determines, Noun and Pronoun, Adjective and Adverb, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,

Written English:

Advance Writing Skills (formal, informal paragraph, story, letter, application,

Personality development: Soft Skills Development, Body Language, Behavioral and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management

ADCHN 8 – NETWORKING FUNDAMENTALS

- **Basic of Computer Network:**
 - Introduction to Network and Networking, Advantage and Disadvantages of Networking, Types of network configuration- (Client-Server model and Peer-to-Peer model), types of computer network- (LAN, WAN, MAN, CAN, SAN, PAN, etc.).
- **Communication:**
 - Introduction to Communication, Difference between Serial and Parallel communication, Introduction to Simplex, Half-Duplex and Full-Duplex network communication, Difference between Unicasting, Broadcasting and Multicasting communication method.
- **OSI Model:**
 - Introduction to Open System Interconnection (OSI) Model, Layers of OSI Model, Role of each layer, Difference between OSI Model and TCP/IP Model.
- **Topologies:**
 - Introduction to Network Topologies, Types of Topologies (Bus, Star, Mesh, Ring, Tree, Hybrid), Structure of each topology, Advantage and Disadvantage of topologies.
- **Networking Hardware Components:**
 - Introduction to hardware components, Types of hardware components- (Computer, Ports, Connectors, Cables, Internetworking devices), Introduction to Computer, Types of ports, types of connectors, Introduction to Cables and Internetworking devices.

- **Transmission Media:**
 - Characteristics of Cables, Types of Cables- (Copper Cable and Optical Fiber Cable), Types of Copper Cable- (STP, UDP, Thin-net, Thick-net), Types of Optical Fiber Cable- (Mono-mode and Multi-mode), Advantage and Disadvantage of types of Cables.
- **Internetworking Devices:**
 - Types of internetworking devices- (NIC, Hub, Switch, Router, Gateway, etc.), Types of NIC- (Wired and Wireless), Introduction to Hub, Introduction to Switch, Introduction to Router, Introduction to Gateway.
- **Networking Software Components:**
 - Introduction to software components, Types of software components-(Network Operating System, Drivers, Protocol, Services, Addresses), Introduction to types of Network Operating System, Types of Network Protocols-(Communication Protocol, Hardware Dependent Protocol, Software Dependent Protocol), Types of Protocol Services-(File & Printer, Multimedia, Email, WWW, etc.).
- **IP Addressing:**
 - IP Address, MAC Address, Port Address, IP Address classification, Difference between IPv4 & IPv6, Difference between Physical Address and Logical Address, Difference between Static and Dynamic configuration, Different Classes of IP Address, Difference between Public and Private IP Address.
- **Servers:**
 - Introduction to Use of Servers, Types of Server- (File Server, Database Server, Print Server, Web Server, Proxy Server).
- **Internet Basics:**
 - Introduction to Internet, History of Internet, working on Internet, Introduction to Broadband Connection, Introduction to ADSL Connection, Introduction to Data Card Connection, Sharing an Internet Connection,
- **Working with E-mail Client:**
 - Introduction to E-mail, creating an E-mail account, Introduction to MS Outlook and Lotus Notes, Configuring MS Outlook, Backup and restore of e-mails.
- **Wireless Networking:**
 - Introduction to Wireless Networking, Difference between wired and wireless network, Introduction to Wireless Standard-(IEEE 802.11), Wireless Networking Components-(Medium, Access Point, Wireless Router, Antennas, Adapters, etc.), Types of Wireless Network-(Ad-Hoc Network, Infrastructure wireless LAN).
- **Network Troubleshooting:**
 - Introduction to Network Troubleshooting, Physical Connection Troubleshooting, LED Status Troubleshooting, Command Line Troubleshooting, Software Tools Troubleshooting, Hardware Tools Troubleshooting,

ADCHN 9 - WINDOWS NT SERVER MANAGEMENT

- Introduction to Windows NT, Various Features, Differences with other Windows Environment and other O. S. s. Windows NT workstations Versus Server. Kernel and its Subsystems: Kernel/User Mode, Win32 Subsystem.
- Security Models: System level restrictions, Server application security, Domain group access, Right and privilege verification, Application Support- Windows and Non Windows applications.
- Installation: Requirement Analysis, Basic Hardware required, Workgroup and Domain concepts: PDC, BDC.

- Network Configuration: Selecting NIC, Installing NIC driver, Choosing protocols and services
- NT Administration: User manager for domain, Disk administration, Backup, System policy editor, Remote access administration, Network clients administration.
- Control panel- Start and stops services from control Panel, Adding/Removing Hardware and Software with control panel.
- Windows NT File systems: Physical file organization, Basic File systems: FAT, NTFS, CDFS, HPFS, The FAT file systems, The NTFS file systems, File systems Integrity and recoverability, File compression.
- Networking with TCP/IP: TCP/IP services in NT, Advantages of using TCP/IP in NT, TCP/IP installation and configuring DHCP and WINE services.
- Remote Access Service: Remote access clients and servers, Installing and configuring Remote Access Server, Administration of RAS.
- Setting and running up a web server – Windows NT web server - Internet Information Server, IIS setup, setting up a web site, Virtual directories, Virtual Web Sites. Administration of Web Server with ISM.
- Windows NT Registry – Registry working, Necessity of registry, Registry Database layout, Registry Editor and its working.
- Diagnosis and troubleshooting NT hardware and software installation problems, Startup problems, problems with Logon, Accounts & password, Network HW and SW problems, Performance problems. NT diagnostic tools: WINMSD, Network Monitor.
- HAL, Kernel and Executive: Hardware Abstraction Layer (HAL), Kernel – Kernel objects and Threads, NT Executives – I/O Manager and Device Drivers, Process Manager, Virtual Memory Manager, Object manager, LPC facility, Security Reference Monitor.
- Protected Subsystems: NT Subsystem's working, Win32 Subsystem difference between Win16 & Win32, Testing and Queuing Model, Win32 Programming Support, Windows on Windows- Starting win16 programs, multitasking with WOW VDM, Thunking 16-bit to 32-bit runtimes, Intercrosses Communication (IPC), MSDOS Emulation Layers.
- Device Drivers: Windows device scheme, NT Drivers Models- Service Control Monitor, Kernel Mode, User modes, Virtual device mode, Driver requirements and operations.

ADCHN 10 - WINDOWS 2000 & 2003 SERVER MANAGEMENT

- Introduction to Windows Server 2000(R1, R2 variations -32 bit and 64 bit)
- Deployment of Windows Server 2000
- User Group Management
- Storage Management
- TCP/IP and Ipv4 Network Management
- Understanding NetBIOS, Wins and NetBT
- Configuring DNS and DHCP Server
- Security Management
- Implementing Volume Shadow Copy
- Controlling with MMC
- Controlling with CLI
- Controlling Windows with Registry
- Controlling Windows Group Policy
- Windows Server Virtualization

- Active Directory Domains Services
- Active Directory Certificate Services
- Terminal Services Enhancements Clustering Enhancements
- Implementing and Troubleshooting Nap
- IIS installation and configuration.
- Implementing Active Directory Services.
- Planning and Implementing
- Restoring Active Directory.
- Introduction to windows server 2003
- Introduction, Managing and Maintaining Windows Server 2003 Environment
- New in Windows Server 2003
- Compare with Windows Server 2000
- Virtualization concepts

ADCHN 11 - LINUX AND INSTALLATION

- Overview of Linux
- Installation of Linux
- Linux Advanced File System Management
- Besh Shell
- Linux Commands.
- Running DOS Command in Linux.
- Configuration of partition in Linux.
- Text Editor-vi
- Bash Shell Scripting
- Basic Networking in Linux.
- Configuration and Installation of Hardware Device
- Linux File Security
- Connect to Internet in Linux.
- Installation software in Linux.
- Kernel Services and Configuration
- System Monitoring
- Reading Linux Partition in Windows & reading windows partition in Linux.

ADCHN 12 – INTRODUCTION TO ENTREPRENEURSHIP DEVELOPMENT

The Concept of Entrepreneurship : Introduction to Entrepreneurship, What is Entrepreneurship?, Stimulation of Entrepreneurship, Policy Entrepreneurship and An Ideal Entrepreneur; Theory of Entrepreneurship : Entrepreneurship Developing Countries, Entrepreneurship Stimulation, Entrepreneurship and Economic Growth, Entrepreneurship and Economic System and Theories of Entrepreneurship; Growth of Entrepreneurship : Role of Entrepreneurs, Growth of Entrepreneurs and Prospects for Entrepreneurship.

Nature and Importance of Entrepreneurs : Entrepreneurial Qualities, Entrepreneurial Functions, Entrepreneur vs Entrepreneurship, Opportunity Matrix, Entrepreneurial Decision, Role of

Entrepreneurs and Growth of Entrepreneurs; Classification and Types of Entrepreneurs : Business Entrepreneurs, Types of Entrepreneurs, Entrepreneurs and Motivation and Growth and Entrepreneurs; Nature and Scope of Management : Scope of Management, Meaning of Management, Characteristics of Management, Objectives of Management, Management as a Profession, Organization and Management, Branches of Management, Importance of Management and Managerial Skills; Planning (Concept, Process & Types) : Importance of Planning, Definition of Planning, Characteristics of Planning, Importance of Planning, A Good Plan and Advantages of Planning.

Concept of Organization (Significance, Process & Nature) : Organization Concept, Definitions of Organization, Organization Theory, Formal and Informal Organization, Significance of Organization, Organization Process, Analysis of Organization, Nature of Organization, Organization as an Art, Group Dynamics and Organization Development; Motivation : What is Motivation, Meaning of Motivation, Kinds of Motivation, MC Gregor's Theory X and Theory Y, Coordination : Company's Culture, Company Compensation and Benefits, Need-Hierarchy Theory of Motivation, Motivational Techniques and Financial and Non-Financial Incentives; Leadership : What is Leadership?, Characteristics of Leadership, Definitions of Leadership, Great Man Theory of Leadership, Leadership Patterns, Role of Leadership, Leadership Styles, Techniques of Leadership, Functions of Leader, Qualities of Leadership, Hindrances to Leadership, Process of Leadership and Develop Voluntary Cooperation.

Communication : Definitions of Communication, Features of Communication, Need of Communication, Communication Process Communication Process Models, Gestural or Non-Verbal Communication, Models of Grapevine, Communications Networks, Barriers in Communication, How to Make Effective Communication?, How to Improve Written Communication?, Salient Features of Good Communication System and Salient Features of Effective Communication; Accounts for Small Enterprise : How Accounts are Maintained?, Learning Objectives, Need of Accounting, Meaning of Accounting, Objective of Accounting, Accounting Process, Journal, What is an Account?, Ledger, Trial Balance, Final Accounts, Profit and Loss Account, Balance Sheet and Account from Incomplete Records; Entrepreneurship Development Institutions : Entrepreneurship Development, Development Banks and Entrepreneurship Development Institutions.

AISECT Model of Entrepreneurship: Multipurpose Electronics & Computer Centres and Field Area Survey & Secondary Data Analysis; How to Set Up an AISECT Centre : Opportunities in IT & ITES, About AISECT and How to Set Up an AISECT Centre; Training for Self Employment : Training for Self Employment and Self Employment Schemes.

ADCHN 13 - PROJECT

- Select the project.
- Collect the information related to project
- Identify the technology in terms of front end, back end, hardware tools used, software tool used.
- Write the brief synopsis for project
- Get the synopsis approved from project in charge
- Proceed for the project using system development life cycle
- System development life cycle contain the steps like in to gathering designing, coding, development, testing, dispatched.
- Demonstrate the complete project through power point presentation to project in charge

Counseling and Study Structure

S No .	Course Code	Title of the Course	Cred it	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Couns eling	Self study	Prac tical	Assig nmen ts
Semester I								
1	ADCHN1	Fundamental of Computers and Information Technology	2	60	8	34	-	18
2	ADCHN 2	Safety Practices in the Work Environment	1	30	4	11	6	9
3	ADCHN 3	Assembly of PC	2	60	8	22	12	18
4	ADCHN 4	PC Installation and Maintenance	2	60	8	22	12	18
5	ADCHN 5	Basic and Digital Electronics	2	60	8	22	12	18
6	ADCHN 6	Computer Hardware Maintenance (CHM)	3	90	12	33	18	27
7	ADCHN 7	Communication and Personality Development	1	30	4	17	-	9
Semester II								
8	ADCHN 8	Networking Fundamentals	2	60	8	22	12	18
9	ADCHN 9	Windows NT Server Management	2	60	8	22	12	18
10	ADCHN 10	Windows 2000 & 2003 Server Management	3	90	12	33	18	27
11	ADCHN 11	Linux & Installation	3	90	12	33	18	27
12	ADCHN 12	Introduction to Entrepreneurship Development	2	60	8	34	-	18
13	ADCHN 13	Project	7	210	-	-	210	-

Study Modules & Books Information

Sr. No	Course Code	Subject Name	Modules to be used
1	ADCHN 1	Fundamentals of Computers and Information Technology	S01- Fundamentals of Computers and Information Technology
2	ADCHN 2	Safety Practices in the Work Environment	S69 : Safety Practices, Primary Health and Personal Hygiene
3	ADCHN 3	Assembly of P.C.	1). Computer Hardware Course, BPB Publication 2). Comdex Hardware and Networking Course Kit, Dreamtech
4	ADCHN 4	P.C. Installation & Maintenance	1). Computer Hardware Course, BPB Publication 2). Comdex Hardware and Networking Course Kit, Dreamtech
5	ADCHN 5	Basic & Digital Electronics	1)V25 : Basic Electronics, AISECT (Hindi) 2)V26 : Digital Electronics, AISECT (Hindi) 3). Basic Electronics, NIMI, Chennai (English) 4). Basic Digital Electronics, NIMI, Chennai (English)
9	ADCHN 6	Computer Hardware Maintenance (CHM)	1). Computer Hardware Course, BPB Publication 2). Comdex Hardware and Networking Course Kit, Dreamtech
7	ADCHN 7	Communication and Personality Development	S68 : Effective Communication And Personality Development
8	ADCHN 8	Networking Fundamentals	IT09 - Computer Networks
9	ADCHN 9	Windows NT Server Management	H10 - Windows Server Management
10	ADCHN 10	Windows 2000 & 2003 Server Management	H10 - Windows Server Management
11	ADCHN 11	Linux & Installation	S26 - Linux
12	ADCHN 12	Introduction to Entrepreneurship Development	S 56 : Introduction to Entrepreneurship
13	ADCHN 13	Project	-

DIPLOMA IN ELECTRICAL TECHNICIAN (DET)

Diploma in Electrical Technician (DET)

डिप्लोमा इन इलेक्ट्रीकल टेक्नीशियन (DET)

(A) Duration : 12 Months (D) Courses : 12
 1 1/2 vof/k : 12 elg 1 1/2 dk 1 : 12

(B) Eligibility : 10th Pass (E) Credit : 32
 1 1/2 i k-rk : 100m i k 1 1/2 ØfM : 32

(C) Contents and Scheme of Examination

1 1/2 i k; Øe fo" k l ph , oai j h k ; k uk

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
Semester I										
DET1	Basic Electricity बेसिक इलेक्ट्रीसिटी	3	100	50	20	20	8	30	12	<ul style="list-style-type: none">Familiarity with basic electricity
DET2	Tools and Meters used in Electrical Repair and Maintenance इलेक्ट्रीकल रिपेयर एंड मँटेनेंस मे प्रयुक्त टूल्स एवं मीटर्स	2	100	50	20	20	8	30	12	<ul style="list-style-type: none">Familiarity with tools and meters for electrical repair
DET3	Safety Practices in the Work Environment कार्यस्थल पर सुरक्षा प्रबन्ध	1	100	50	20	20	8	30	12	<ul style="list-style-type: none">Familiarity with electrical safety, fire safety, first aid, food safety, primary health and basic hygiene
DET4	House Wiring Principles and Practices घरेलू वायरिंग सिद्धांत एवं प्रेक्टिस	3	100	50	20	20	8	30	12	<ul style="list-style-type: none">Familiarization with electrical accessories and protective devicesSkill in electrical wiring systems

										<ul style="list-style-type: none"> Skill in testing of wiring installations and knowledge of Indian electricity rules and licensing
DET5	Electrical Home Appliance Repairing घरेलू इलेक्ट्रिकल उपकरणों की रिपेयरिंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Basic appliances working principles Skill in repair of home appliances working on heating effect and magnetic effect
DET6	Introduction to Transformers ट्रांसफार्मर से परिचय	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand working principles and construction of single phase and three phase transformers
Semester II										
DET 7	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	1	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Basic communication skills Personality grooming
DET8	Introduction to Motors & Generators मोटर्स एवं जनरेटर्स से परिचय	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand working principles and construction of D. C. motors and generators Understand single phase and three phase A. C. motors
DET9	Motor and Transformer Winding मोटर एवं ट्रांसफार्मर वाइंडिंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Skill in transformer winding Skill in D. C. and A. C. motor winding
DET10	Auto Electricals and Battery Maintenance & Repair आटो इलेक्ट्रिकल एवं बैटरी मेंटेनेंस तथा रिपेयरिंग	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Skill in repair and maintenance of auto electrical items and battery

DET11	Introduction to Entrepreneurship उद्यमिता से परिचय	2	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Understanding of entrepreneurship development concepts
DET12	Project प्रोजेक्ट	7	-	-	-	100	40	-	-	<ul style="list-style-type: none"> On the job skill by working with a repair establishment Basic experience and knowledge for setting up of own repair shop

Note : For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
1200	480

Detailed Syllabus

DET 1: Basic Electricity

Direct Current and Alternating Current: Types of Electrical Supply –DC supply, AC supply; Ohm's Law – Electrical terms and definitions – EMF and Pd, current, resistance, Ohm's law statement, electrical circuit, identification of AC and DC meters.

Work, Power &Energy and Series, Parallel & Series-Parallel Circuits: Work, Power and Energy – Work, force, mechanical power, electrical power, energy; Series Circuit – Definition and explanation, characteristics of series circuit, uses of series connection; Parallel Circuit - Definition and explanation, laws of parallel circuit, common uses; Series-Parallel Connection – Identification of series –parallel connection, examples.

Kirchhoff's Law: Kirchhoff's Law – Explanation, Kirchhoff's current law, Kirchhoff's voltage law, Circuit with more than one voltage source

Magnetism and Electromagnets: Magnetism – magnetism and magnets, kind of magnets, molecular theory of magnetism, the earth's magnetic field, classification of magnetic substances, magnetic terms and properties of magnet; Electromagnet – electromagnetism, the magnetic core, hysteresis loop, pulling power of solenoid, practical applications of electromagnets, comparison between magnetic and electric circuits

Resistors: Resistors – resistors and their types, specification of resistors, classification based upon functions, special resistors – positive temperature coefficient (PTC) resistors, negative temperature coefficient (NTC) resistors, voltage dependant resistor (VDR), light dependent resistor (LDR); Colour Coding of Resistors – resistance and tolerance value of colour coded resistor, preferred values for resistors, letter and digit code for resistance values

Inductors: Inductors – inductors and their types; Inductance – induction, inductance, self-inductance, mutual inductance, inductors in series, inductors in parallel

Capacitors: Capacitors – capacitors, their construction and function; Capacitance – unit of capacitance, factors affecting capacitance, fixed capacitors, variable capacitors; Grouping of Capacitors – necessity of grouping, methods of grouping (parallel grouping and series grouping)

R. L. Series, R. C. Series and R. L. C. Series Circuit: R. L. Series Circuit - inductive reactance, series R – L circuit, quality factor –Q of coil; R – C Series Circuit - capacitive reactance, effect of frequency on capacitive reactance, examples and calculations; R. L. C. Series Circuit – explanation, calculation of resulting reactance and impedance in RLC circuit, measurement of current and voltage drop in RLC circuit

A. C. Parallel Circuit: A. C. Parallel Circuit - parallel R – L circuit, parallel R – C circuit, parallel R-L-C circuit; Resonance – electrical resonance, resonance frequency, series resonant circuit, parallel resonant circuit, Faraday's laws of electromagnetic induction, Fleming's right hand rule

Conductors, Insulators and Semi-Conductors: Conductors – definition, properties of conductors, uses of conductors; Insulators – definition, properties of insulators, uses of insulators.

Semiconductors – atomic structure of semiconductors, types of semiconductors - N-type semiconductor, P-type semiconductor, PN junction

Transformers: Transformer – introduction, principle of action of a transformer, construction of oil-filled transformer, cooling of transformer, transformers type as per output, transformers type as per use, transformer losses, efficiency of transformer

Primary and Secondary Cells: Primary Cell – definition and types of cells, primary cell types, uses, internal resistance & defects of a simple cell; Grouping of Cells – series cell connection, parallel connection, series-parallel connection, testing primary cells or batteries

Secondary Cell – terms and definitions, Faraday’s laws of electrolysis, types of secondary cells, construction and working principle of lead acid cell, efficiency, defects; Charging Secondary Battery – necessity of charging, testing of battery, topping up, methods of charging-constant current method, constant potential method & rectifier method; Care and Maintenance of Battery – care and maintenance, precautions, common defects in accumulators, their causes and remedies

DET 2 : Tools and Meters Used in Electrical Repair and Maintenance

Tools and Equipments Used in Electrical Work & Their Maintenance : Description, sizes and uses of hand tools, Description, sizes and uses of electrical equipments, Care and maintenance of tools and equipments.

Soldering : Type of equipment used for soldering, Method of soldering, Use of right type solder and flux for different types of metals, Care and maintenance of soldering equipment.

Meters Used in Electric Installation : Installation of different types of electric meters and instruments, Functions and uses of various measuring instruments and meters – ampere meter, voltmeter, energy meter, wattmeter, multimeter, megger, earth tester, line tester.

DET 3 – Safety Practices in the Work Environment

Safety Signs & Colour at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Colour- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, First aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, First-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting, Manual lifting techniques using kinetic method, Shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure : Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work: Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene: Introduction, how to maintain good hygiene, how to ensure food safety, Grooming, what are the consequences of not maintaining good hygiene?

Public and Home Safety: Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing, Food safety in the home, Food borne diseases.

DET 4 : House Wiring Principles and Practices

Electrical Accessories : Various accessories and their specifications – switches, lamp holder, ceiling roses, sockets, main switches.

Safety Precautions : Personal protection, Plant protection and handling of equipment, Use of ladder and handling tools, Fire and short circuit.

Protective Devices : Fuses and circuit breakers – fuse, kit kat type fuse or rewirable fuse, cartridge fuse, high rupturing capacity (HRC) type fuse, miniature circuit breaker (MCB), selection of proper fuse wire; **Earthing :** Purpose of earthing, Method of earthing – plate earthing, pipe earthing, selection of right type of earth wire.

Electrical Wiring : System of wiring – tree system, distribution system, looping in system; Types of wiring – cleat wiring, batten wiring, casing and capping, conduit wiring (surface conduit wiring & under ground conduit wiring).

Electric Meters and Switches : Switches, Main switches, Distribution box, Method of fixing energy meter – single phase energy meter, three phase energy meter, three phase four wire energy meter, Connections, Method of preparing circuits – circuit, stair case wiring, godown wiring, hostel wiring, bell lamp indicator.

Testing and Rectification : Testing of wiring installation with megger – insulation or leakage test, continuity or open circuit test, short circuit test, polarity test, testing of earthing system, Testing of wiring installation by series test lamp - insulation or leakage test, continuity, open & short circuit test, polarity test, testing of earthing system, Fault locating and its rectification with megger – open circuit and short circuit, improper polarity, earth not in order, Fault locating and its rectification with series test lamp - open circuit or short circuit fault, earthing not in order.

Indian Electricity Rules and Licensing : Relevant provisions of Indian electricity rules, General conditions relating to supply and use of electric energy, procedure for obtaining license.

DET 5: Electrical Home Appliances Repairing

Heating and Lighting Effect of Current : Introduction, Heating effect and joules law, Domestic appliances of heating effect, Fuses, heating efficiency, Different types of lamps and filaments used.

Electro Magnetic Effects of Current : Permanent magnet and electro magnets, their construction and uses, Comparison between temporary (electromagnet) and permanent magnet, Polarity of an electromagnet and rules for finding the polarity, Fleming's left hand rule.

Principle of Thermostat and Proper Earthing : Principle of thermostat, its construction and working, Types of thermostat, Earthing and its importance,

Electric Regulator : Working principle and construction of electric regulator -resistance type regulator, choke type regulator; Working Principle and Construction of Electronic Regulator : Electronic theory, Electronic regulator; Difference Between Thermostat, Regulator and Dimmer.

Appliances Working on Heating Effect, Their Construction, Common Defects and Rectification : Heating effect, Electric room heater, Electric iron, Electric stove, Electric toaster, Electric kettle, Mosquito repellent, Geyser, Common defects of heating appliances and their rectification.

Appliances Working on Magnetic Effect, Their Construction, Common Defects and Rectification : Magnetic effect, Fan, Room cooler, Heat convactor, Mixer, Juicer, Grinder, Washing machine, Vacuum cleaner.

Construction, Working and Repairing of Voltage Stabilizer : Connection and working of voltage stabilizer, Repair and maintenance.

DET 6 : Introduction to Transformers

Single Phase Transformer : Introduction, Transformer and its main parts – primary winding, secondary winding, core, Principle of transformer and its types as per voltage - step down transformer, step up transformer, EMF equation and transformation ratio, Construction and working of potential transformer, current transformer and clip on motor – potential transformer, current transformer, clip on meter, Working principle, construction and uses of auto transformer – step down auto transformer, step up auto transformer, Applications of different types of single phase transformer, Transformer losses and efficiency, Method of determining losses.

Three Phase Transformer : Introduction, Constructional details of transmission and distribution transformer – transmission transformer, distribution transformer, Construction and working of conservator, breather and Buchholz relay – conservator, breather, Buchholz relay, Different system of cooling of three phase transformers – natural air cooling, natural oil cooling, , forced air cooling, oil blast cooling, forced water cooling, Different methods of connecting the windings of three phase transformers – three phase transformers, star connection, delta connection, Parallel operation of transformers

Care and Maintenance of Transformer : Causes of breakdown of transformer, Factors affecting life of transformer, Maintenance procedure, Recommended maintenance schedule for transformer.

DET 7: Communication and Personality Development

- **English Grammar:** Parts of Speech, - Articles and Determines, Noun and Pronoun, Adjective and Adverb, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,
- **Written English:** Advance Writing Skills (formal, informal paragraph, story, letter, application,
- **Personality development:** Soft Skills Development, Body Language, Behavioral and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management'

DET 8 : Introduction to Motors and Generators

D. C. Generator and Alternator: Principle of D. C. generator, Construction, types and their applications, Alternator – its construction and working, Working of an excitor.

D. C. Motor: Principle, construction, torque and speed, Fleming's left hand rule, Types of D. C. motor, their working, starting and speed control – series wound motor, shunt wound motor, compound wound motor, speed control of D. C. motors, starting of D. C. motors, Armature reaction and commutation, Procedure for dismantling of D. C. motor.

A. C. Three Phase Motor : Constructional features of three phase induction motor – stator, outer frame, stator core, stator winding, rotor, squirrel cage rotor, phase wound rotor, Production of rotating magnetic field and working principle, Torque, synchronous speed, rotor speed and slip – torque, synchronous speed, rotor speed, slip, Types of induction motor and their working – types of induction motor, squirrel cage induction motor slip ring induction motor, Different types of starters – direct on line starter, star delta starter, slip ring motor starter, Reversing of A. C. three phase motors.

Single Phase Motors : Principle of single phase motor and necessity of two windings, Classification of single phase motor – induction type motors, commutator type motors, Working principle of split phase motor, capacitor type induction motor and use of centrifugal switch and capacitor - split phase motor, capacitor type induction motors, General applications of capacitor motors, Use of centrifugal switch, capacitor, General principle and construction of universal motor, shaded pole motor and repulsion motors - universal motor, shaded pole motor, repulsion motor.

Trouble Shooting and Repairing : Method of fault finding and rectification in motors with the help of megger and lamp, Method of fault finding and rectification in control gears.

Installation of Motors : Process of laying foundation for motors, Preparing and installing main switch board and control gears, Method of installing of motors; Preventive Maintenance : Procedure for periodical checking, Maintenance schedule.

DET 9 : Motor and Transformer Winding

Transformer Winding : Designing a small transformer on the basis of output and core area, Size of wire used in primary and secondary windings, Winding the transformer.

Winding Materials : Types of conductors used in winding, Various types of insulating papers, tapes, sleeves and wedges, Impregnating varnishes and paints used in winding,

D. C. Machine Winding : Fundamental terms used in winding – turn, active side, inactive coil side, leads of coil, coil span or coil throw, coils per pole, Different types of pitches used in winding – pole pitch, coil pitch or winding pitch, full pitched winding, short chorded winding, long chorded winding, back pitch, front pitch, commutator pitch, Different types of connections and layers in windings – progressive connections, retrogressive connections, symmetrical connections / winding, unsymmetrical connections / winding, layers of winding, single layer winding, double layer winding, multiple coil winding, Types of D. C. armature winding as per armature core – ring type armature, drum type armature, hand winding, formed coil winding, Classification of DC winding – lap winding, wave winding.

A. C. Winding : Terms and definitions used in winding – inductor, end turn, turns, coil, coil side, coil lead, coil group, half coil winding, full coil winding, single layer winding, double layer winding, pole pitch, coil pitch, full pitch winding, long pitch winding, short pitch winding, Different types of connections used in winding, Connections for three phase motors – coil connections, group connections, phase connections, Types of winding based on shape of coils – flat loop winding, concentric winding, chain winding, basket winding, diamond coil winding, involute coil winding, skew winding, skein winding, Balanced, unbalanced winding and calculating degree per slot - balanced and unbalanced winding, Procedure for rewinding old motor, and understanding different datas for rewinding – procedure for rewinding old motor, Winding methods – hand winding, form winding, skein winding, procedure for rewinding old motor, and understanding different datas for rewinding, Preparing winding table and development diagram of 3 phase winding, Connection – coil connection, group connection, phase connection, Procedure for rewinding of double voltage and double speed motor – double voltage motor, two speed motor, Method of testing motors after rewinding – open circuit, short circuit, leakage fault or earth fault.

Baking and Varnishing : Baking and varnishing the stators winding – baking, varnishing, Baking of windings in baking oven.

Single Phase Motor Winding : Method of rewinding the stator of capacitor type induction motor – winding of stator of capacitor type induction motor, method of rewinding, Procedure for rewinding of permanent capacitor type motor – ceiling fan, table fan, cooler fan motor, Rewinding procedure of universal motor, shaded pole motor and repulsion motor.

DET 10 : Auto Electricals and Battery Maintenance & Repair

Lead Acid Battery : Lead acid battery - construction, chemical action and battery features, Battery care, battery testing and battery charging, Battery trouble shooting – no charging, over charging, buckled case, sulphation of plates, short circuiting of cells, different cell voltage.

Auto Electrical – Charging System : D. C. generator – construction, working principles, testing procedure, regulating system, A. C. generator (alternator) - construction, working principles, testing procedure, regulating devices, Difference between A. C. and D. C. generators, Trouble shooting for charging system – no output, low output, erratic output, excessive output.

Auto Electrical – Starting System : Construction and working principle of starter motor, Types of drives used for starter motor, Starter switch and its circuit, Trouble shooting for starting system – starter fails to rotate, starter rotates slowly, starter does not crank the engine, starter unable to engage and dis-engage, Dyna Start (a mono device which works as a starter and generator) – construction, working principle and functions.

Auto Electrical – Ignition System : Types of ignition system, their components and testing of components, Magnetic pulse distributor, Electronic ignition system, Trouble shooting for ignition system - no spark, weak spark, intermittent spark.

Lighting System : Layout of circuits – headlights, tail lights, sparking lights, hazard lights, side indicator, panel light, brake light, reverse light, cab light, door light, Wiper circuit, horn circuit, exhaust brake circuit, fuel shut off circuit, gear display electric circuit, glow plug circuit, electronic diesel control circuit, electrical fuel pump circuit, multi point injection system, Layout of circuits for gauges and indicators – pressure gauge, temperature gauge, fuel gauge, brake fluid gauge, vacuum gauge, charging, oil low and high pressure, high beam, low beam, hazard, neutral, parking light, side stand indicators.

DET 11 : Introduction to Entrepreneurship Development

The Concept of Entrepreneurship : Introduction to Entrepreneurship, What is Entrepreneurship?, Stimulation of Entrepreneurship, Policy Entrepreneurship and An Ideal Entrepreneur; Theory of Entrepreneurship : Entrepreneurship Developing Countries, Entrepreneurship Stimulation, Entrepreneurship and Economic Growth, Entrepreneurship and Economic System and Theories of Entrepreneurship; Growth of Entrepreneurship : Role of Entrepreneurs, Growth of Entrepreneurs and Prospects for Entrepreneurship.

Nature and Importance of Entrepreneurs : Entrepreneurial Qualities, Entrepreneurial Functions, Entrepreneur vs Entrepreneurship, Opportunity Matrix, Entrepreneurial Decision, Role of Entrepreneurs and Growth of Entrepreneurs; Classification and Types of Entrepreneurs : Business Entrepreneurs, Types of Entrepreneurs, Entrepreneurs and Motivation and Growth and Entrepreneurs; Nature and Scope of Management : Scope of Management, Meaning of Management, Characteristics of Management, Objectives of Management, Management as a Profession, Organization and Management, Branches of Management, Importance of Management and Managerial Skills; Planning (Concept, Process & Types) : Importance of Planning, Definition of Planning, Characteristics of Planning, Importance of Planning, A Good Plan and Advantages of Planning.

Concept of Organization (Significance, Process & Nature) : Organization Concept, Definitions of Organization, Organization Theory, Formal and Informal Organization, Significance of Organization, Organization Process, Analysis of Organization, Nature of Organization, Organization as an Art, Group Dynamics and Organization Development; Motivation : What is Motivation, Meaning of Motivation, Kinds of Motivation, MC Gregor's Theory X and Theory Y, Coordination : Company's Culture, Company Compensation and Benefits, Need-Hierarchy Theory of Motivation, Motivational Techniques and Financial and Non-Financial Incentives; Leadership : What is Leadership?, Characteristics of Leadership, Definitions of Leadership, Great Man Theory of Leadership, Leadership Patterns, Role of Leadership, Leadership Styles, Techniques of Leadership, Functions of Leader, Qualities of Leadership, Hindrances to Leadership, Process of Leadership and Develop Voluntary Cooperation.

Communication : Definitions of Communication, Features of Communication, Need of Communication, Communication Process Communication Process Models, Gestural or Non-Verbal Communication, Models of Grapevine, Communications Networks, Barriers in Communication, How to Make Effective Communication?, How to Improve Written Communication?, Salient Features of Good Communication System and Salient Features of Effective Communication; Accounts for Small Enterprise : How Accounts are Maintained?, Learning Objectives, Need of Accounting, Meaning of Accounting, Objective of Accounting, Accounting Process, Journal, What

is an Account?, Ledger, Trial Balance, Final Accounts, Profit and Loss Account, Balance Sheet and Account from Incomplete Records; Entrepreneurship Development Institutions : Entrepreneurship Development, Development Banks and Entrepreneurship Development Institutions.

AISECT Model of Entrepreneurship : Multipurpose Electronics & Computer Centres and Field Area Survey & Secondary Data Analysis; How to Set Up an AISECT Centre : Opportunities in IT & ITES, About AISECT and How to Set Up an AISECT Centre; Training for Self Employment : Training for Self Employment and Self Employment Schemes.

DET 12: Project

Counseling and Study Structure

S. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
Semester I								
1	DET 1	Basic Electricity	3	90	12	33	18	27
2	DET 2	Tools and Meters used in Electrical Repair and Maintenance	2	60	8	22	12	18
3	DET 3	Safety Practices in the Work Environment	1	30	4	11	6	9
4	DET 4	House Wiring Principles and Practices	3	90	12	33	18	27
5	DET 5	Electrical Home Appliance Repairing	3	90	12	33	18	27
6	DET 6	Introduction to Transformers	3	90	12	33	18	27
Semester II								
7	DET 7	Communication and Personality Development	1	30	4	17	-	9
8	DET 8	Introduction to Motors & Generators	2	60	8	22	12	18
9	DET 9	Motor and Transformer Winding	3	90	12	33	18	27
10	DET 10	Auto Electricals and Battery Maintenance & Repair	2	60	8	22	12	18
11	DET 11	Introduction to Entrepreneurship Development	2	60	8	34	-	18
12.	DET 12	Project	7	210	-	-	210	-

Study Modules & Books Information

S. No	Course Code	Subject Name	Modules to be used
1	DET 1	Basic Electricity	i) Basic Electricals and Electronics, NIMI, Chennai ii) V 01 : House Wiring and Electrical Home Appliance Repairing ii) V35 : Electrical Technician – House Wiring & Electrical Home Appliance Repairing
2	DET 2	Tools and Meters used in Electrical Repair and Maintenance	
3	DET 3	Safety Practices in the Work Environment	S69 : Safety Practices, Primary Health and Personal Hygiene
4	DET 4	House Wiring Principles and Practices	i) V 01 : House Wiring and Electrical Home Appliance Repairing ii) V35 : Electrical Technician – House Wiring & Electrical Home Appliance Repairing
5	DET 5	Electrical Home Appliance Repairing	
6	DET 6	Introduction to Transformers	i) V 02 : Motor and Transformer Winding ii) V36 : Electrical Technician - Transformer & Motor Re-winding and Pump Operation & Maintenance
7	DET 7	Communication and Personality Development	S68 : Effective Communication And Personality Development
8	DET 8	Introduction to Motors & Generators	i) V 02 : Motor and Transformer Winding ii) V36 : Electrical Technician - Transformer & Motor Re-winding and Pump Operation & Maintenance
9	DET 9	Motor and Transformer Winding	
10	DET 10	Auto Electricals and Battery Maintenance & Repair	Photocopy Material on Auto Electrician
11	DET 11	Introduction to Entrepreneurship Development	S 56:Introduction to Entrepreneurship
12	DET 12	Project	-

**DIPLOMA IN REFRIGERATION
AND AIR-CONDITIONING (DRA)**

Diploma in Refrigeration and Air-Conditioning (DRA)

डिप्लोमा इन रिफ्रिजरेशन एवं एयर कंडीशनिंग (DRA)

(A) Duration : 12 Months

1/2 वर्ष : 12 महीने

(B) Eligibility : 10th Pass

1/2 : 10वीं कक्षा

(D) Courses : 13

1/2 : 13

(E) Credit : 32

1/2 : 32

(C) Contents and Scheme of Examination

1/2 : 10वीं कक्षा, 11वीं कक्षा, 12वीं कक्षा

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
Semester I										
DRA1	Fundamentals of Electricity इलेक्ट्रीसिटी से परिचय	2	100	50	20	20	8	30	12	<ul style="list-style-type: none">Familiarity with basic electricity
DRA2	Basic Principles of Refrigeration & Air-Conditioning and Components of Refrigeration System रेफ्रीजिरेशन एवं एयर-कंडीशनिंग के बेसिक प्रिंसिपल एवं रेफ्रीजिरेशन सिस्टम के कम्पोनेंट्स	3	100	50	20	20	8	30	12	<ul style="list-style-type: none">Familiarity with basic principles of refrigeration and air-conditioning

DRA3	Safety Practices in the Work Environment कार्यस्थल पर सुरक्षा प्रबंध	1	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Familiarity with electrical safety, fire safety, first aid, food safety, primary health and basic hygiene
DRA4	Refrigerants रेफ्रीजिरेन्ट्स	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Familiarization with properties and classification of refrigerants Knowledge of application of refrigerants and safety precautions
DRA5	Electric Motors, Electric Components and Controls इलेक्ट्रिक मोटर्स, इलेक्ट्रिक कम्पोनेंट्स एवं कंट्रोल्स	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Familiarity with basic principles and working of electric motors used in refrigerator and air-conditioner Familiarity with various controls used in refrigerator and air-conditioner
DRA6	Gas Charging, Safety Precautions and Tools & Equipments गैस चार्जिंग, सैफ्टी प्रीकाशन्स तथा टूल्स एवं इक्विपमेंट्स	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand method of pressure leak testing and method of gas charging Understanding of safety precautions while handling refrigerant cylinder Familiarity with tools and equipment required in refrigeration and air-conditioning workshop
DRA7	Introduction to Entrepreneurship उद्यमिता से परिचय	2	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Understanding of entrepreneurship development concepts
Semester II										
DRA8	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	1	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Basic communication skills Personality grooming

DRA9	Air-conditioning एयर-कंडीशनिंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand working principles and construction of window type and split type air-conditioner Familiarity with central air-conditioning plant and industrial air-conditioning
DRA10	Water Coolers and other Applications वाटर कूलर्स एवं अन्य उपयोग	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Familiarity with basic principles and working of water coolers and household refrigerator Familiarity with ice manufacturing, cold storage and desert or evaporative cooler
DRA11	Wiring of Refrigerator & Air-conditioning रेफ्रीजरेटर वायरिंग एवं एयर-कंडीशनर की वायरिंग	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand wiring of refrigerator Understand wiring of air conditioner
DRA12	Trouble Shooting and Remedies ट्रबल्स शूटिंग एवं रेमिडीज	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Skill in locating faults and their rectification Understanding common troubles and their remedies
DRA13	Project प्रोजेक्ट	7	-	-	-	100	40	-	-	<ul style="list-style-type: none"> On the job skill by working with a repair establishment Basic experience and knowledge for setting up of own repair shop

Note : For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
1300	520

Detailed Syllabus

DRA 1: Fundamentals of Electricity

Direct Current and Alternating Current : Types of Electrical Supply –DC supply, AC supply; Ohm's Law – Electrical terms and definitions – EMF and P_d , current, resistance, Ohm's law statement, electrical circuit, identification of AC and DC meters.

Work, Power & Energy and Series, Parallel & Series-Parallel Circuits: Work, Power and Energy – Work, force, mechanical power, electrical power, energy; Series Circuit – Definition and explanation, characteristics of series circuit, uses of series connection; Parallel Circuit - Definition and explanation, laws of parallel circuit, common uses; Series-Parallel Connection – Identification of series –parallel connection, examples.

Kirchhoff's Law: Kirchhoff's Law – Explanation, Kirchhoff's current law, Kirchhoff's voltage law, Circuit with more than one voltage source

Magnetism and Electromagnets: Magnetism – magnetism and magnets, kind of magnets, molecular theory of magnetism, the earth's magnetic field, classification of magnetic substances, magnetic terms and properties of magnet; Electromagnet – electromagnetism, the magnetic core, hysteresis loop, pulling power of solenoid, practical applications of electromagnets, comparison between magnetic and electric circuits

Resistors: Resistors – resistors and their types, specification of resistors, classification based upon functions, special resistors – positive temperature coefficient (PTC) resistors, negative temperature coefficient (NTC) resistors, voltage dependant resistor (VDR), light dependent resistor (LDR); Colour Coding of Resistors – resistance and tolerance value of colour coded resistor, preferred values for resistors, letter and digit code for resistance values

Inductors: Inductors – inductors and their types; Inductance – induction, inductance, self inductance, mutual inductance, inductors in series, inductors in parallel

Capacitors : Capacitors – capacitors, their construction and function; Capacitance – unit of capacitance, factors affecting capacitance, fixed capacitors, variable capacitors; Grouping of Capacitors – necessity of grouping, methods of grouping (parallel grouping and series grouping)

R. L. Series, R. C. Series and R. L. C. Series Circuit : R. L. Series Circuit - inductive reactance, series R – L circuit, quality factor – Q of coil; R – C Series Circuit - capacitive reactance, effect of frequency on capacitive reactance, examples and calculations; R. L. C. Series Circuit – explanation, calculation of resulting reactance and impedance in RLC circuit, measurement of current and voltage drop in RLC circuit

A. C. Parallel Circuit : A. C. Parallel Circuit - parallel R – L circuit, parallel R – C circuit, parallel R-L-C circuit; Resonance – electrical resonance, resonance frequency, series resonant circuit, parallel resonant circuit, Faraday's laws of electromagnetic induction, Fleming's right hand rule

Conductors, Insulators and Semi-Conductors : Conductors – definition, properties of conductors, uses of conductors; Insulators – definition, properties of insulators, uses of insulators.

Semiconductors – atomic structure of semiconductors, types of semiconductors - N-type semiconductor, P-type semiconductor, PN junction

Transformers : Transformer – introduction, principle of action of a transformer, construction of oil-filled transformer, cooling of transformer, transformers type as per output, transformers type as per use, transformer losses, efficiency of transformer

Primary and Secondary Cells : Primary Cell – definition and types of cells, primary cell types, uses, internal resistance & defects of a simple cell; Grouping of Cells – series cell connection, parallel connection, series-parallel connection, testing primary cells or batteries

Secondary Cell – terms and definitions, Faraday's laws of electrolysis, types of secondary cells, construction and working principle of lead acid cell, efficiency, defects; Charging Secondary Battery – necessity of charging, testing of battery, topping up, methods of charging-constant current

method, constant potential method & rectifier method; Care and Maintenance of Battery – care and maintenance, precautions, common defects in accumulators, their causes and remedies

DRA 2 : Basic Principles of Refrigeration & Air Conditioning and Components of Refrigeration System

Refrigeration : Introduction and History of Refrigeration, Laws of Refrigeration, Applications of Refrigeration (Mechanical).

Fundamental Science Related to Refrigeration and Air Conditioning : Heat and Temperature, Transfer of Heat, Condensation and Evaporation, Pressure, Refrigeration Cycle, Vapour Compression System.

Condensing Unit : Open Type Condensing Unit, Sealed or Hermetic Unit, Compressor : Reciprocating Compressor and its Working Principle, Hermetic Reciprocating Compressor, Mufflers, Parts of Reciprocating Compressor; Compressor Oil and Lubrication Systems : Lubrication, Applications, Properties of Oil, Types of Oil, Lubrication Methods.

Condenser : Air Cooled condenser - Fins and Tube condenser, Plate Type Condenser, Plate and Tube Type Condenser, Liquid Receiver, Gas Filter / Strainer.

Drier : Sealed Drier, Refillable Drier, Refrigerant Control Devices; Expansion Valves: Automatic Expansion Valve, Capillary Tube / Choke Tube.

Evaporator : Bare Tube Evaporator, Plate Surface Evaporator, Finned Tube Evaporator

Gasket Making and Door Gaskets : Introduction, Types of Gaskets, Method of Making a Perfect Gasket.

DRA 3: Safety Practices in the Work Environment

Safety Signs & Colour at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Colour- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, first aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, first-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting, Manual lifting techniques using kinetic method, shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure: Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work: Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene: Introduction, how to maintain good hygiene, how to ensure food safety, Grooming, what are the consequences of not maintaining good hygiene?

Public and Home Safety : Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing, Food safety in the home, Food borne diseases.

DRA 4: Refrigerants

Introduction, Definition, Properties of Good Refrigerant, Chemical and Trade Name of Common Refrigerants.

Classification of Refrigerants: Primary Refrigerants, Secondary Refrigerants, Selection of Refrigerants, Physical and Chemical Properties of Refrigerants.

Application of Commonly Used Refrigerants, Safety Precautions.

DRA 5: Electric Motors, Electric Components and Controls

AC Electric Motors: Introduction and Definitions, Types of Single Phase Induction Run Motor; Starting Relay: Definition and Types of Relay.

Blower Motor Used in Air Conditioner: Introduction, Purpose of Blower Motor, Types of Blower Motors, Wiring Diagram of Single Speed Blower Motor, Two Speed Blower Motor and Three Speed Blower Motor.

Capacitor: Definition and Capacity of Capacitor, Types of Capacitors; Selector Switch: Working of Selector Switch, Types of Selector Switch, Wiring Diagram of Selector Switch with Single Speed, Two Speed and Three Speed Blower Motors.

Controls: Thermostat – Bimetallic Control and Metallic Bulb Type; Humidistate – Mechanical Type and Electrical Type; Air State; Relay – Electric Magnetic Relay, Thermal Relay and Voltage Relay; Overload Protector; Pressure Control.

DRA 6 : Gas Charging, Safety Precautions and Tools & Equipments

Gas Charging : Method of Pressure Leak Testing, Removing Air from the System, Method of Gas Charging in Sealed Unit.

Gas Charging in Window AC and Water Cooler : Pressure Leak Testing, Vacuum in System, Gas Charging in System, Gas Charging Operating Pressure.

Safety Precautions : Possible Causes of Fire and Steps to Prevent Fire, General Safety Precautions while Handling Refrigerant Cylinder.

Tools and Equipment Required in a Refrigeration and Air-Conditioning Workshop : General Tools Required in Workshop, Refrigeration Tools & Raw Material, Special Tools for Refrigeration Workshop, Equipment Required in Refrigeration Workshop, Material Required, Use of Important Tools, Safety Precautions, First Aid.

DRA 7: Introduction to Entrepreneurship

The Concept of Entrepreneurship : Introduction to Entrepreneurship, What is Entrepreneurship?, Stimulation of Entrepreneurship, Policy Entrepreneurship and An Ideal Entrepreneur; Theory of Entrepreneurship : Entrepreneurship Developing Countries, Entrepreneurship Stimulation, Entrepreneurship and Economic Growth, Entrepreneurship and Economic System and Theories of Entrepreneurship; Growth of Entrepreneurship : Role of Entrepreneurs, Growth of Entrepreneurs and Prospects for Entrepreneurship.

Nature and Importance of Entrepreneurs : Entrepreneurial Qualities, Entrepreneurial Functions, Entrepreneur vs Entrepreneurship, Opportunity Matrix, Entrepreneurial Decision, Role of Entrepreneurs and Growth of Entrepreneurs; Classification and Types of Entrepreneurs : Business Entrepreneurs, Types of Entrepreneurs, Entrepreneurs and Motivation and Growth and Entrepreneurs; Nature and Scope of Management : Scope of Management, Meaning of Management, Characteristics of Management, Objectives of Management, Management as a Profession, Organization and Management, Branches of Management, Importance of Management and Managerial Skills; Planning (Concept, Process & Types) : Importance of Planning, Definition of Planning, Characteristics of Planning, Importance of Planning, A Good Plan and Advantages of Planning.

Concept of Organization (Significance, Process & Nature) : Organization Concept, Definitions of Organization, Organization Theory, Formal and Informal Organization, Significance of Organization, Organization Process, Analysis of Organization, Nature of Organization, Organization as an Art, Group Dynamics and Organization Development; Motivation : What is Motivation, Meaning of Motivation, Kinds of Motivation, MC Gregor's Theory X and Theory Y, Coordination : Company's Culture, Company Compensation and Benefits, Need-Hierarchy Theory of Motivation, Motivational Techniques and Financial and Non-Financial Incentives; Leadership : What is Leadership?, Characteristics of Leadership, Definitions of Leadership, Great Man Theory of Leadership, Leadership Patterns, Role of Leadership, Leadership Styles, Techniques of Leadership, Functions of Leader, Qualities of Leadership, Hindrances to Leadership, Process of Leadership and Develop Voluntary Cooperation.

Communication : Definitions of Communication, Features of Communication, Need of Communication, Communication Process Communication Process Models, Gestural or Non-Verbal Communication, Models of Grapevine, Communications Networks, Barriers in Communication, How to Make Effective Communication?, How to Improve Written Communication?, Salient Features of Good Communication System and Salient Features of Effective Communication; Accounts for Small Enterprise : How Accounts are Maintained?, Learning Objectives, Need of Accounting, Meaning of Accounting, Objective of Accounting, Accounting Process, Journal, What is an Account?, Ledger, Trial Balance, Final Accounts, Profit and Loss Account, Balance Sheet and Account from Incomplete Records; Entrepreneurship Development Institutions : Entrepreneurship Development, Development Banks and Entrepreneurship Development Institutions.

AISECT Model of Entrepreneurship : Multipurpose Electronics & Computer Centres and Field Area Survey & Secondary Data Analysis; How to Set Up an AISECT Centre : Opportunities in IT & ITES, About AISECT and How to Set Up an AISECT Centre; Training for Self Employment : Training for Self Employment and Self Employment Schemes.

DRA 8 : Communication and Personality Development

- **Basic Grammar for Effective Communication : Parts of Speech** – Revision (sentence, phrase, clause, parts of speech), Noun, Pronoun, Adjective, Article, Verb, Active & Passive Voice, Infinitive, Gerund, Preposition, Conjunctions, Interjection; **Analysis, Transformation, Synthesis and Direct & Indirect Speech** – The phrase, the clause, the sentence, Analysis of compound and complex sentences, Transformation of sentences, Synthesis of sentences, Direct and indirect speech; Composition and Comprehension – Picture composition, How to write short a short story, Letter writing; **Situational communication**
- **Personality Development** : Communication skills, Body language, Positive attitude, Etiquette and manners, SWOT analysis, Decision making, Goal setting, Positive thinking, Self confidence, Motivation, Time management, Anger management, Stress management, Leadership, Team building,

DRA 9 : Air Conditioning

Introduction; Classification of Air Conditioner; Principle of Working Window Type Air-Conditioner; Main Parts of a Window Type Air Conditioner and their Working.

Split Type Air Conditioner; Difference Between Window Type and Split Type Air Conditioner; Advantages and Disadvantages of Split Type Air Conditioner, Principle of Working of Split type Air Conditioner.

Comfortable Temperature and Humidity; Method of Using Psychrometric Chart; Purification of Circulating Air.

Central Air Conditioning Plant : Location of Central Air Conditioning Plant; Summer Air Conditioning System; All Year Air Conditioning System, Winter Air Conditioning System.

Industrial Air Conditioning; Equipment Used in the Air Conditioning Plant.

DRA 10 : Water Coolers and other Applications

Water Coolers : Working of a Water Cooler, Main Parts of a Water Cooler and their Working, Types of Water Coolers; Household Refrigerator : Introduction, Storage Compartment, Volume of the Refrigerator, Operation, Installation & Safety, Electrical Component of Refrigerator.

Ice Manufacturing : Can Ice System, Plate Ice System.

Cold Storage : Introduction, Operation of the Plant.

Desert or Evaporative Cooler : Construction, Principle of Operation, Types of Evaporative Cooler, Sizing of Cooler, Advantages and Limitations of Desert Cooler.

DRA 11 : Wiring of Refrigerator and Air Conditioner

Wiring of Refrigerator : Electrical Parts of a Refrigerator, Method of Tracing the Thermostatic and Cabinet Light Wires, Precautions.

Wiring of Air Conditioner : Introduction, Electrical Components of an Air Conditioner, Complete Wiring Diagram of an Air Conditioner.

DRA 12: Trouble Shooting and Remedies

Locating Faults : Checking of Capacitor, Fan / Blower Motor Testing, Overload Protector Testing.

Common Troubles and Their Remedies

DRA 13 : Project

The student will be attached to a Service and Repair Centre for one month. He will learn the techniques of fault finding, testing and repair and maintenance of refrigerator and air conditioner and submit a report covering all aspects.

Counseling and Study Structure

Sl. No .	Cours e Code	Title of the Course	Cre dit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self stu dy	Practi cal	Assignments
Semester I								
1	DRA 1	Fundamentals of Electricity	2	60	8	22	12	18
2	DRA 2	Basic Principles of Refrigeration and Air Conditioning and Components of Refrigeration Systems	3	90	12	33	18	27
3	DRA 3	Safety Practices in the Work Environment	1	30	4	11	6	9
4	DRA 4	Refrigerants	2	60	8	22	12	18
5	DRA 5	Electric Motors, Electric Components and Controls	3	90	12	33	18	27
6	DRA 6	Gas Charging, Safety Precautions and Tools & Equipments	2	60	8	22	12	18
7	DRA 7	Introduction to Entrepreneurship	2	60	8	34	-	18
Semester II								
8	DRA 8	Communication and Personality Development	1	30	4	17	-	9
9	DRA 9	Air-conditioning	3	90	12	33	18	27
10	DRA 10	Water Coolers and Other Applications	2	60	8	22	12	18
11	DRA 11	Wiring of Refrigerator & Air-Conditioner	2	60	8	22	12	18
12	DRA 12	Trouble Shooting and Remedies	2	60	8	22	12	18
13.	DRA 13	Project	7	210	-	-	210	-

Study Modules & Books Information

Sr. No	Course Code	Subject Name	Modules to be used
1	DRA 1	Fundamentals of Electricity	Basic Electricals and Electronics, NIMI, Chennai
2	DRA 2	Basic Principles of Refrigeration and Air Conditioning and Components of Refrigeration Systems	V 41 : Refrigeration and Air Conditioning
3	DRA 3	Safety Practices in the Work Environment	S69 : Safety Practices, Primary Health and Personal Hygiene, AISECT
4	DRA 4	Refrigerants	i) V 41 : Refrigeration and Air Conditioning ii) A Text Book of Refrigeration and Air Conditioning by Shiv Dubey & S. K. Bhargav
5	DRA 5	Electric Motors, Electric Components and Controls	
6	DRA 6	Gas Charging, Safety Precautions and Tools & Equipments	
7	DRA 7	Introduction to Entrepreneurship	S 56 : Introduction to Entrepreneurship
8	DRA 8	Communication and Personality Development	S68 : Effective Communication and Personality Development, AISECT
9	DRA 9	Air-conditioning	i) V 41 : Refrigeration and Air Conditioning ii) A Text Book of Refrigeration and Air Conditioning by Shiv Dubey & S. K. Bhargav
10	DRA 10	Water Coolers and Other Applications	
11	DRA 11	Wiring of Refrigerator & Air-Conditioner	
12	DRA 12	Trouble Shooting and Remedies	
13	DRA 13	Project	-

**DIPLOMA IN IT HARDWARE
SERVICE AND TECHNICAL
SUPPORT (DIHSTS)**

Diploma in IT Hardware Service and Technical Support (DIHSTS)

वर्षावधि 12 मासों में 13 पाठ्यक्रमों के माध्यम से 32 क्रेडिटों के साथ

(A) Duration : 12 Months (D) Courses : 13
 1/2 वर्षों में 12 से अधिक पाठ्यक्रमों के माध्यम से 32 क्रेडिटों के साथ

(B) Eligibility : 12th Pass (E) Credit : 32
 1/2 वर्षों में 12 से अधिक पाठ्यक्रमों के माध्यम से 32 क्रेडिटों के साथ

(C) Contents and Scheme of Examination

1/2 वर्षों में 13 पाठ्यक्रमों के माध्यम से 32 क्रेडिटों के साथ

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
Semester I										
DIHSTS 1	Computer System and Peripherals कंप्यूटर प्रणाली और बाह्य उपकरणों	2	100	70	28	-	-	30	12	<ul style="list-style-type: none">Understand the functions, characteristics & basic components of a computer system and Operating SystemKnow-how of various peripherals, storage devices & understand their physical structure & working
DIHSTS 2	Working with Ms Office एमएस ऑफिस के साथ काम करना	1	100	50	20	20	8	30	12	<ul style="list-style-type: none">Familiarity with MS word functions
DIHSTS 3	Windows 10 Installation and Computer Maintenance विंडोज 10 स्थापना और कंप्यूटर रखरखाव	2	100	50	20	20	8	30	12	<ul style="list-style-type: none">Understand window 10 parts/ modules of computerDemonstrate the installation of windows 10Perform the computer maintenance

DIHSTS 4	Safety Practices in The Work Environment कार्य वातावरण में सुरक्षा अभ्यास	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand the various safety point at the workplace
DIHSTS 5	Networking नेटवर्किंग	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Narrate network concepts and terminology Identify, install and configure network components Identify and learn about hardware components for a peer-to-peer network Understand installation of network printers.
DIHSTS 6	Windows Server Operation System Installation and Configuration विंडोज सर्वर ऑपरेशन सिस्टम इंस्टॉलेशन और कॉन्फिगरेशन	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand installation process of operating system. Understand hard disk partitioning fundamentals. Understand and demonstrate software installation and removal.
Semester II										
DIHSTS 7	LINUX ADMINISTRATION लिनक्स प्रशासन	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand know-how to install and configure a Linux system as a server especially as a Web Server, mail server, DNS, Proxy and Samba server. Setup LAN using Linux server Operating System. Understand basic server maintenance task.
DIHSTS 8	INTRODUCTION TO STORAGE AND CLOUD COMPUTING भंडारण और क्लाउड कंप्यूटिंग का परिचय	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand the way to store the data on the cloud Learn the importance of cloud storage Describe the secure features of cloud storage

DIHSTS 9	It Infrastructure Management आईटी बुनियादी ढांचा प्रबंधन	4	150	70	20	20	8	30	12	<ul style="list-style-type: none"> Learn about the concepts of IT infrastructure management Describe the way to manage the IT infrastructure
DIHSTS 10	Communication and Personality Development संचार और व्यक्तित्व विकास	4	150	70	20	20	8	30	12	<ul style="list-style-type: none"> Basic communication skills Personality grooming
DIHSTS 11	Introduction to Entrepreneurship उद्यमिता का परिचय	2	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Understanding of entrepreneurship development concepts
DIHSTS 12	Project परियोजना	7	-	-	-	100	40	-	-	<ul style="list-style-type: none"> On the job skill by working with a hardware maintenance establishment company. Experience of PC assembly and maintenance of computer. Experience of setting up a LAN in office/organization/ institute to disseminate information/app/internet services within organization.

Note: For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
1200	480

Detailed Syllabus

Semester 1

DITHSTS 1 – Computer System and Peripherals

Fundamentals of Computer: Brief history of the development of computers, Computer system concepts, Types of computers, Generations of computers, Software and its Need, Types of Software - System software, Application software;

Basic Components of a Computer System: Control unit, detailed functions of ALU, Input/Output functions and characteristics;

Motherboard: Introduction, Types of Motherboard, Motherboard Components (Slots, Sockets, Ports, Connectors, Chipsets, Busses), Types of Chipsets, Types of Ports, Types of Slots, Types of Socket, Types of connectors;

Input/ Output Units: Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen; Sound Card and Speakers; Monitors – characteristics and types of the monitor -Digital, Analog, Features of Monitor (Size, Resolution, Contrast Ratio), Monitor Settings, Video Standard - VGA, SVGA, XGA etc.;

SMPS: Introduction, Components of SMPS, Working of SMPS, Output Voltages of SMPS, Control signal, Power connectors of SMPS, Form Factor of SMPS, Factor considering before selecting an SMPS; Installation of SMPS, Troubleshooting of SMPS;

BIOS: Introduction, Difference between Software and Firmware, BIOS Manufacturing (AMI, Award, MR BIOS, Phoenix Technology), BIOS Packaging, CMOS Setup, Updating the BIOS.

Reference Book

(1) Microprocessor architecture programming and application with the 8085 ramesh gaonkar penram international publication (2) Electronics and radio engineering m.l. Gupta dhanpat rai & sons, new Delhi (3) PC and clones hardware, troubleshooting and maintenance b. Govinda rajalu, tata mc-graw-hill publication (4) pc troubleshooting and repair stephen j. Bigelow dream tech press, new Delhi

DITHSTS 2 – Working with Ms Office

MS WORD 2007/10: Creating, opening and saving documents, Entering and editing text, Setting up the document: margin, page breaks, and more. **Formatting:** text, paragraphs, headings, Themes and templates, Spelling, grammar, and reference tools, Printing Word documents, Planning with outlines, Working with long documents and master documents, Organizing your information with tables

MS EXCEL 2007/10: Creating and navigating worksheets, Adding information to worksheets, Moving data around worksheets, Managing worksheets and workbooks, Formatting Cells, Smart Formatting tricks, Viewing and printing worksheets, Building basic formulas, Math and statistical functions, Financial functions

Ms Powerpoint 2007/10: Creating an introductory presentation, Editing slides, Formatting and aligning your text, Formatting and laying out your slides, Editing your slides show, Adding charts, diagrams, and tables

Reference Book

(1) Windows 98 BPB Publication (2) Windows XP Professional edition complete BPB Publication (3) Office XP complete BPB publication

DITHSTS 3 – Windows 10 Installation and Computer Maintenance

Basics of Operating System

Operating System Basics, Basic concepts of operating systems- Desktop, Network, Server; minimum hardware requirements and compatibility with the OS, Characteristics of modern operating systems, booting of a system from DOS/Windows, Fundamentals of Hard Disk Partitioning and Formatting Hard Disk using F-disk/ Disk Manager

Installation of Windows 10

Installing, Upgrading and Migrating to Windows 10: Preparing, Clean and Image-based Installation, Upgrading and Migrating to Windows 10, Configuring Windows 10; Configuring disks and device drives: Partitioning Disks in Windows 10, Managing Disk Volumes

Configuring Network Connectivity: Configuring IPv4 Network Connectivity, Configuring IPv6 Network Connectivity, Implementing Automatic IP Address Allocation,

Securing Windows 10 Desktops: Overview of Security Management in Windows 10, Security Windows 10 Client Computer by Using Local Security Policy Settings

Configuring User Account Controls, Configuring Windows Firewall, Configuring Security Setting in Internet Explorer 11.0, Configuring Windows Defender, Configuring Windows Firewall, Internet Explorer 8 Security and Windows Defender

Optimizing and Maintaining Windows 10 Client Computers: Maintaining performance by using the windows 10 Performance Tools, Maintaining Reliability by Using the Windows 10 Diagnostic Tools, Backing Up and restoring data by Using Windows backup

Reference Books

(1) B. A. Forouzan: *Data Communications and Networking*, fourth edition, THM Publishing Company Ltd 2007. (2) A. S. Tanenbaum: *Computer Networks*, Fourth edition, PHI Pvt. Ltd 2002

DITHSTS 4 – Safety Practices in The Work Environment

Safety Signs & Color at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Color- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, First aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Artificial Respiration - Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing a fire, Fire extinguishers, Types of fire extinguishers

Safe Working Measure: Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines, Safe Lifting and Carrying Techniques

Managing Health and Safety at Work: Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipment, Office safety procedures, Emergency action plan.

Reference Books

Recognition of Health Hazards in the Workplace Martin R. Horowitz, Marilyn F. Hallock

Safety at Work - 8th Edition - John Channing – Routledge

DITHSTS 5 – Networking

Communication: Introduction to Communication, Serial and Parallel communication, Introduction to Simplex, Half-Duplex and Full-Duplex network communication

Network Topologies: Introduction to Network and Networking, Advantages and Disadvantages of Networking, Types of network configuration, types of computer network- LAN, WAN, MAN, CAN, SAN, PAN, etc., Introduction to Open System Interconnection (OSI) Model, Layers of OSI Model, Role of each layer, Difference between OSI Model and TCP/IP Model, Introduction to Network Topologies, Types of Topologies (Bus, Star, Mesh, Ring, Tree, Hybrid), Structure of each topology, Advantage and Disadvantage of topologies.

Internetworking Devices: NIC, Hub, Switch, Router, Gateway; Introduction to transmission media, Characteristics of Cables, Advantages and Disadvantages of Cables, Crimping and cabling.

Software: Introduction to software components, intranet works and Internetwork Devices, Types of software components, Introduction to types of Network Operating Systems, Types of Network Protocols, Types of Protocol Services

IP Address, MAC Address, Port Address, IP Address classification, Difference between IPv4 & IPv6, Difference between Physical Address and Logical Address, Difference between Static and Dynamic configuration, and Difference between Public and Private IP Address. Subnetting fundamentals, Sub netting in classes A, B & C

Internet: Introduction to Internet, History of the Internet, working on Internet, Introduction to Broadband Connection, Introduction to ADSL Connection, Introduction to Data Card Connection, sharing an Internet Connection, Introduction to E-mail, Creating an E-mail account;

Wireless Networking: Introduction to Wireless Networking, Difference between wired and wireless network, Introduction to Wireless Standard, Wireless Networking Components, Wireless Network.

Communication over the network, Application layer functionality and protocols, OSI transport layer, OSI network Layer, Addressing the network IPv4, Data Link Layer, OSI physical Layer, Ethernet, Planning and cabling networks, Configuring and Testing your network, Introduction of routing and packet forwarding, Static routing, Introduction to dynamic routing protocols,

Introduction to Network Troubleshooting, Physical Connection Troubleshooting, LED Status Troubleshooting, Command Line Troubleshooting, Software Tools Troubleshooting, Hardware Tools Troubleshooting

Reference Book

(1) *Networking Complete BPB Publication* (2) *Computer Networking Andrew S. Tanenbawan By PHI*

DITHSTS 6 – Windows Server Operation System Installation and Configuration

Operating System Basics & Installation: Introduction to OS, Types of Operating systems, System files FAT and NTFS Dos 6.22, Windows XP, Windows Vista, Windows 7 and Windows 8 and Red Hat Linux and Multi-Boot Operating System

Various types of Software Installation: MS-Office2003, Office 2007, Office 2010, Photoshop 7 and CS5, PageMaker 6.5, Corel-Draw X3, Auto-CAD, Tally 7.0 and ERP, Acrobat Reader X, Java, Visual Studio, C & C++, Multimedia software's, and Internet Browsers like- IE9, Google Chrome, Mozilla Firefox etc.

Device Installation: Graphics Card, Sound Card, LAN Card, Wireless LAN Card, SCSI Card, External Drive, Flash Cards, Web Camera, CCTV Camera, Mobile Devices, Pen Drive, Firmware Cards, Modem, Plotter, Wireless LAN, Access Point etc.

Diagnostic Tools & PC Maintenance: Introduction, Virus and its types, Effect of Virus for Computer System, Scanning and Antivirus remover tools, Antivirus Utilities for Diagnostic, Safety and Preventive Maintenance Tools, Data Recovery, Concept of Fax and E-mail, PC care and Maintenance, Electrical Power Issues, Troubleshooting PC Hardware: O/S Troubleshooting issues in computer System

Basic Network Introduction & Installation: Introduction About Network, Installing Network Operating System Windows 2003 Server and Windows 2008 Server, Cable Crimping, Network Sharing and user Permission, Internet Connection, E-Mail, Cloud Networking, Google Drive, SkyDrive, Dropbox etc.

Reference Books

(1) *Mastering Windows Server 2019: The complete guide for IT professionals to install and manage Windows Server 2019 and deploy new capabilities, 2nd Edition.*

(2) *Windows Server 2016: Domain Infrastructure*

Semester 2

DITHSTS 7 – Linux Administration

Introduction to Free and Open Source Software, Definitions and Historical development of Open Source Software, Linux Installation and Configuration- Introduction, The Linux File System, A review of the Linux File System, Partitioning Schemes, Linux Installation; Linux Command line Structure, Linux File Management - Files and Directories, Handling Directories, Using cp and mv; Linux Post Installation Activities, Devices and Linux File System Management, Process Management- Listing terminating and scheduling programmers executions on a Red Hat Enterprises Linux system;

Groups and User Management- Reading and setting permission on files and directories, Introduction of advanced file systems permissions like Set UID and Set GID; Text Manipulation- text-processing utilities in Red Hat Enterprise Linux, including grep, cut, sed, sort, diff and patch; Linux Kernel, Bash Scripting- using shell variables and scripts to customize the command – line environment;

Software Package Installation, Linux Windowing Environment, Linux System Administration, Linux Networking Configuration, setting up

Basic Networking Services: DNS, DHCP and LDAP, Web/Internet Gateway, E-mail Gateway, Linux Security, troubleshooting mythologies, System Performance and Security, System Service Access Controls, Configure, control and secure access to FTP, NFS and SMB/CIFS (Samba) Configure implements and secure access to the Apache Web Server and Squid Proxy Cache

Reference Book

(1) *Windows 2003 and 2008 Server by BPB Publication* (2) *Windows XP Professional and Windows 7 Edition by BPB Publication* (3) *Red Hat Linux by BPB & SYBEX publication* (4) *Linux Bible by BPB & SYBEX publication*

DITHSTS 8 – Introduction to Storage and Cloud Computing

Technical journey from floppy disk to cloud storage, Storage Media, Data Tape, Hard disk drive, Solid state drive, optical disk, Cloud Storage, Introduction to Storage domain (DAS, SAN, NAS, RAID levels), Storage Interface, Storage Protocols, NAS, SAN, Backup and Recovery, Storage Virtualization, Introduction to cloud, benefits and risk of cloud computing.

Creating and Managing Windows Server 2008 RAID Volumes: Introduction, creating a striped volume using disk manager and using a command line,

Cloud Computing: Planning, technologies, architecture, infrastructure component, public cloud model, private cloud model, hybrid cloud model, community cloud model, infrastructure as a service, plate as a service, software as a service, identity as a service, network as a service, cloud computing management, cloud computing data storage, cloud computing security, cloud computing operation, cloud computing application, cloud computing providers, cloud computing challenges, mobile cloud computing.

Reference Books

(1) Cloud Computing: Theory and Practice by Dan C. Marinescu

The Basics of Cloud Computing: Understanding the Fundamentals of Cloud Computing in Theory and Practice by Derrick Rountree & Ileana Castrillo

DITHSTS 9 - It Infrastructure Management

Introduction, IT Infrastructure Management, IT Service Management- SLA, TAT etc., Introduction to ITIL, ITIL Process model, Service support process set- Configuration Management, Incident Management, Problem Management, Service Desk, Change Management, Release Management; Services Delivery Process Set - Service Level Management, Capacity Management, IT Service Continuity Management, Availability Management, Security Management, Financial Management.

Introduction to various quality management standards- BS1500, ISO 9000 etc., Quality aspects of an organization, Quality control in various department of an organization, Quality manual.

Reference Books

(1) Cloud Native Infrastructure: Patterns for Scalable Infrastructure and Applications in a Dynamic by Justin Garrison & Kris Nova

DITHSTS 10 – Communication and Personality Development

Grammar: Parts of Speech, - Articles and Determines, Nouns and Pronoun, Adjectives and Adverbs, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,

Written English: Advance Writing Skills (formal, informal paragraph, story, letter, application)

Personality Development: Soft Skills Development, Body Language, Behavioral and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management

Reference Books

Develop Your Leadership Skills: Develop Yourself as a Leader - Lead at a Strategic Level - Grow Leaders by John Adair

Transforming Communication in Leadership and Teamwork: Person-Centered Innovations by Renate Motschnig & David Ryback (auth.)

DITHSTS 11 – Introduction to Entrepreneurship

The Concept of Entrepreneurship: Introduction to Entrepreneurship, what is Entrepreneurship? Stimulation of Entrepreneurship, Policy Entrepreneurship and an Ideal Entrepreneur;

Theory of Entrepreneurship: Entrepreneurship Developing Countries, Entrepreneurship Stimulation, Entrepreneurship and Economic Growth, Entrepreneurship and Economic System and Theories of Entrepreneurship; **Growth of Entrepreneurship:** Role of Entrepreneurs, Growth of Entrepreneurs and Prospects for Entrepreneurship.

Nature and Importance of Entrepreneurs: Entrepreneurial Qualities, Entrepreneurial Functions, Entrepreneur vs Entrepreneurship, Opportunity Matrix, Entrepreneurial Decision, Role of Entrepreneurs and Growth of Entrepreneurs;

Classification and Types of Entrepreneurs: Business Entrepreneurs, Types of Entrepreneurs, Entrepreneurs and Motivation and Growth and Entrepreneurs;

Nature and Scope of Management: Scope of Management, Meaning of Management, Characteristics of Management, Objectives of Management, Management as a Profession,

Organization and Management, Branches of Management, Importance of Management and Managerial Skills;

Planning (Concept, Process & Types): Importance of Planning, Definition of Planning, Characteristics of Planning, Importance of Planning, A Good Plan and Advantages of Planning.

Concept of Organization (Significance, Process & Nature): Organization Concept, Definitions of Organization, Organization Theory, Formal and Informal Organization, Significance of Organization, Organization Process, Analysis of Organization, Nature of Organization, Organization as an Art, Group Dynamics and Organization Development;

Motivation: What is Motivation, Meaning of Motivation, Kinds of Motivation, MC Gregory's Theory X and Theory Y,

Coordination: Company's Culture, Company Compensation and Benefits, Need-Hierarchy Theory of Motivation, Motivational Techniques and Financial and Non-Financial Incentives;

Leadership: What is Leadership?, Characteristics of Leadership, Definitions of Leadership, Great Man Theory of Leadership, Leadership Patterns, Role of Leadership, Leadership Styles, Techniques of Leadership, Functions of Leader, Qualities of Leadership, Hindrances to Leadership, Process of Leadership and Develop Voluntary Cooperation.

Communication: Definitions of Communication, Features of Communication, Need of Communication, Communication Process Communication Process Models, Gestural or Non-Verbal Communication, Models of Grapevine, Communications Networks, Barriers in Communication, how to Make Effective Communication? How to Improve Written Communication? Salient Features of Good Communication System and Salient Features of Effective Communication;

Accounts for Small Enterprise: How Accounts Are Maintained? Learning Objectives, Need of Accounting, Meaning of Accounting, Objective of Accounting, Accounting Process, Journal, what is an Account? Ledger, Trial Balance, Final Accounts, Profit and Loss Account, Balance Sheet and Account from Incomplete Records;

Entrepreneurship Development Institutions: Entrepreneurship Development, Development Banks and Entrepreneurship Development Institutions.

AISECT Model of Entrepreneurship: Multipurpose Electronics & Computer Centres and Field Area Survey & Secondary Data Analysis;

How to Set up an AISECT Centre: Opportunities in Hardware and Electronics sector, About AISECT and How to Set Up a Hardware and Networking academy Centre;

Training for Self Employment: Training for Self Employment and Self Employment Schemes.

Reference Books

(1) *Entrepreneurship: A Very Short Introduction* by Paul Westhead & Mike Wright

(2) *Innovation and Entrepreneurship: Theory, Policy and Practice* by Elias G. Carayannis & Elpida T. Samara

Counseling and Study Structure

Sl. No .	Course Code	Title of the Course	Cred it	Total Hour s of Stud y	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Pract ical	Assignm ents
Semester I								
1	DIHSTS 1	Computer System And Peripherals	2	60	8	34	-	18
2	DIHSTS 2	Working With MS Office	1	30	4	11	6	9
3	DIHSTS 3	Windows 10 Installation And Computer Maintenance	2	60	8	22	12	18
4	DIHSTS 4	Safety Practices In The Work Environment	2	60	8	22	12	18
5	DIHSTS 5	Networking	2	60	8	22	12	18
6	DIHSTS 6	Windows Server Operation System Installation And Configuration	3	90	12	33	18	27
Semester II								
7	DIHSTS 7	Linux Administration	2	60	8	22	12	18
8	DIHSTS 8	Introduction to Storage and Cloud Computing	2	60	8	22	12	18
9	DIHSTS 9	It Infrastructure Management	3	90	12	33	18	27
10	DIHSTS 10	Communication And Personality Development	3	90	12	33	18	27
11	DIHSTS 11	Introduction To Entrepreneurship	2	60	8	34	-	18
12	DIHSTS 12	Project	7	210	-	-	210	-

Study Modules & Books Information

Sr. No	Course Code	Subject Name	Modules to be used
Semester I			
1	DIHSTS 1	Computer System and Peripherals	S01- Fundamentals of Computers and Information Technology
2	DIHSTS 2	Working with MS Office	S01- Fundamentals of Computers and Information Technology
3	DIHSTS 3	Windows 10 Installation And Computer Maintenance	1). Computer Hardware Course, BPB Publication 2). Comdex Hardware and Networking Course Kit, Dreamtech
4	DIHSTS 4	Safety Practices In The Work Environment	S69 : Safety Practices, Primary Health and Personal Hygiene
5	DIHSTS 5	Networking	IT09 - Computer Networks
6	DIHSTS 6	Windows Server Operation System Installation And Configuration	H10 - Windows Server Management 1). Computer Hardware Course, BPB Publication 2). Comdex Hardware and Networking Course Kit, Dreamtech
Semester II			
7	DIHSTS 7	Linux Administration	S26 - Linux
8	DIHSTS 8	Introduction To Storage And Cloud Computing	1). Computer Hardware Course, BPB Publication 2). Comdex Hardware and Networking Course Kit, Dreamtech
9	DIHSTS 9	It Infrastructure Management	IT09 - Computer Networks
10	DIHSTS 10	Communication And Personality Development	S68 : Effective Communication And Personality Development
11	DIHSTS 11	Introduction To Entrepreneurship	S 56 : Introduction to Entrepreneurship
12	DIHSTS 12	Project	

**CERTIFICATE FOR TV REPAIR
TECHNICIAN (CTRRT)**

Certificate for TV Repair Technician (CTRT)

सर्टिफिकेट फॉर टी.वी. रिपेयर टेक्नीशियन (CTRT)

(A)	Duration	: 6 Months	(D)	Courses	: 8
(B)	Eligibility	: 10th Pass	(E)	Credit	: 16
(C)	Contents and Scheme of Examination				

(C) Contents and Scheme of Examination

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Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
CTRT 1	Basic Electrical and Electronics बेसिक इलेक्ट्रीकल एण्ड इलेक्ट्रॉनिक्स	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Familiarity with basic electrical and electronics Explain the function of various electronic components such as transistor, resistor, capacitor, inductor, tuner, transformer etc
CTRT 2	Basic Concept of Television System टेलीविजन सिस्टम के बेसिक कन्सेप्ट	2	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Basic electronics and circuit knowledge specially with respect to Television set Understand the function of monochrome and colour picture tube.
CTRT 3	Safety Practices in the Work Environment कार्य परिवेश में सुरक्षा प्रबंध	1	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Familiarity with safety practice at workplace. Knowledge about various hazards and their remedies.

										<ul style="list-style-type: none"> • Ensure clean, dust free and organized working environment. • Knowledge of Primary first aid for any accidental situation. • Understand about personal health and hygiene.
CTRT 4	TV Servicing Tools and Equipments टी वी सर्विसिंग टूल्स और इक्विपमेन्ट्स	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> • Select tools and testing equipment require for TV servicing • Operate multi-meter, soldering iron, cathode ray oscilloscope
CTRT 5	Installation of TV set टी.वी. सेट का इन्स्टालेशन	1	100	50	20	20	8	30	12	<ul style="list-style-type: none"> • Select tools and equipment for installation • Securing the installation space • Install TV on stand and wall mount • Make all necessary connection
CTRT 6	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	1	100	70	28	-	-	30	12	<ul style="list-style-type: none"> • Basic communication skills. • Personality grooming. • Responding to customer queries effectively. • Understand customer's requirements.
CTRT 7	Repairing of CRT TV set CRT टेलीविजन रिपेयरिंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> • Basic fundamental of CRT television set • Different section of a TV and their functioning • Repair the CRT television set • Understand the symptoms and identify the fault

CTRT 8	Repairing of Flat Panel Display (FPD) TV set फ्लैट पैनल डिस्प्ले टेलीविजन रिपेयरिंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> • Basic fundamental of LCD/ LED television set • Inspect all electrical and electronic parts of the unit • Identify the reason for fault on the LED/ LCD TV set and fix it. • Troubleshooting knowledge with respect to LED/ LCD TV set
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Note: For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
800	320

Detailed Syllabus

CTRT 1 - Basic Electrical and Electronics

Direct Current and Alternating Current: Types of Electrical Supply –DC supply, AC supply; Ohm's Law – Electrical terms and definitions – EMF and Pd, current, resistance, Ohm's law statement, electrical circuit, identification of AC and DC meters.

Work, Power &Energy and Series, Parallel & Series-Parallel Circuits : Work, Power and Energy – Work, force, mechanical power, electrical power, energy; Series Circuit – Definition and explanation, characteristics of series circuit, uses of series connection; Parallel Circuit - Definition and explanation, laws of parallel circuit, common uses; Series-Parallel Connection – Identification of series –parallel connection, examples.

Kirchhoff's Law: Kirchhoff's Law – Explanation, Kirchhoff's current law, Kirchhoff's voltage law, Circuit with more than one voltage source

Magnetism and Electromagnets : magnetism and magnets, kind of magnets, molecular theory of magnetism, the earth's magnetic field, classification of magnetic substances, magnetic terms and properties of magnet; Electromagnet – electromagnetism, the magnetic core, hysteresis loop, pulling power of solenoid, practical applications of electromagnets, comparison between magnetic and electric circuits

Resistors : resistors and their types, specification of resistors, classification based upon functions, special resistors – positive temperature coefficient (PTC) resistors, negative temperature coefficient (NTC) resistors, voltage dependant resistor (VDR), light dependent resistor (LDR); Color Coding of Resistors – resistance and tolerance value of color coded resistor, preferred values for resistors, letter and digit code for resistance values

Inductors: inductors and their types; Inductance – induction, inductance, self inductance, mutual inductance, inductors in series, inductors in parallel

Capacitors: capacitors and their types, their construction and function; Capacitance – unit of capacitance, factors affecting capacitance, fixed capacitors, variable capacitors; Grouping of Capacitors – necessity of grouping, methods of grouping (parallel grouping and series grouping)

R. L. Series, R. C. Series and R. L. C. Series Circuit: R. L. Series Circuit - inductive reactance, series R – L circuit, quality factor –Q of coil; R – C Series Circuit - capacitive reactance, effect of frequency on capacitive reactance, examples and calculations; R. L. C. Series Circuit – explanation, calculation of resulting reactance and impedance in RLC circuit, measurement of current and voltage drop in RLC circuit

A. C. Parallel Circuit : A. C. Parallel Circuit - parallel R – L circuit, parallel R – C circuit, parallel R-L-C circuit; Resonance – electrical resonance, resonance frequency, series resonant circuit, parallel resonant circuit, Faraday's laws of electromagnetic induction, Fleming's right hand rule

Conductors, Insulators and Semi Conductors : Conductors – definition, properties of conductors, uses of conductors; Insulators – definition, properties of insulators, uses of insulators.

Semiconductors – atomic structure of semiconductors, types of semiconductors - N-type semiconductor, P-type semiconductor, PN junction

Active Components – transistor, diodes, and silicon controlled rectifier (SCR), diac, triac, bridge rectifier or Diode Bridge, uni-junction transistor (UJT), field effect transistor (FET)

PN Junction Diodes and Diode Valve : PN Junction Diodes – PN junction, biasing the PN junction- forward bias & reverse bias, V-I characteristics of PN junction, application of diodes, diode equivalent, classification of diodes, types of diode packaging; Diode Valve – diode valve, cathode, anode

Rectifiers and Filter Circuits: Rectifiers – purpose of a rectifier, half wave rectifier, full wave rectifier, bridge rectifier, comparison of half wave, full wave and bridge rectifiers

Filter Circuits – introduction, types of filter circuits-capacitor filter, RC filter, series inductor filter, choke input LC filter, PI-filter (p filter)

Zener Diode and Relays : Zener Diode – introduction, VI characteristics of a Zener diode, avalanche break down, Zener break down, specifications of Zener diodes, applications of Zener diode

Relays – relay, types of relays-electromagnetic relays, current sensing relay, under-current relay, voltage sensing relay, latching relays, mechanical reset relays, electrical reset relays, reed relays, dry

reed relay, ferreed relay mercury wetted contact relay, impulse relay, clapper type armature relay, thermal relay, Poles and contacts, AC relay, Causes of relay failures

Transformers : Transformer – introduction, principle of action of a transformer, construction of oil-filled transformer, cooling of transformer, transformers type as per output, transformers type as per use, transformer losses, efficiency of transformer

Primary and Secondary Cells : Primary Cell – definition and types of cells, primary cell types, uses, internal resistance & defects of a simple cell; Grouping of Cells – series cell connection, parallel connection, series-parallel connection, testing primary cells or batteries

Secondary Cell – terms and definitions, Faraday's laws of electrolysis, types of secondary cells, construction and working principle of lead acid cell, efficiency, defects; Charging Secondary Battery – necessity of charging, testing of battery, topping up, methods of charging-constant current method, constant potential method & rectifier method; Care and Maintenance of Battery – care and maintenance, precautions, common defects in accumulators, their causes and remedies

CTRT 2- Basic Concept of Television System

Television Engineering Basic Concepts: Introduction, Characteristics of vision, Video bandwidth, Scanning Horizontal and Vertical Scan Frequency, Interlaced scanning, Synchronization, Standard video waveform, Vertical sideband (VSB) channel in CCIR system-B, Negative and positive picture transmission, Block schematic of TV receiver and functional requirements

Monochrome Picture Tubes: Picture tube, Factors affecting picture contrast and brightness, Methods of improving contrast, Ion spots

Colour Picture Tubes: Color picture tubes, Delta-gun color picture tube, The in-line gun color picture tube, One gun (three beam) in-line or Trinitron picture tube,

Colour Television Systems: Color television systems, Sequential color television system, Simultaneous Color television systems, Luminance signal, I-and Q-signals, Secam Color television system, Basic parameters of the Secam system, Block diagrams of the Secam coder and decoder, Operation of the line-by-line switch and the color identification circuit, Delay line, Basic features of the PAL system, LCD TV, Methods to display colors by LCD, Circuit of small LCD TV, Large LCD, High definition TV HDTV, Display system for HDTV

CTRT 3 – Safety Practices in The Work Environment

Safety Signs & Color at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Colour- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, First aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, First-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting, Manual lifting techniques using kinetic method, Shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure: Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work: Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene: Introduction, how to maintain good hygiene, how to ensure food safety, Grooming, what are the consequences of not maintaining good hygiene?

Public and Home Safety : Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing, Food safety in the home, Food borne diseases.

CTRT 4- TV Servicing Tools and Equipments

Measuring Instruments:

Moving coil Meter, Ammeter, Voltmeter, Ohmmeter, Multimeter, Digital Multimeter,

TOOLS:

Long Nose Pliers, Diagonal Cutters, Nut Driver, Screw Drivers, Tweezers, Soldering Kit, SMD Rework Station, Chip Quick SMD removal kit, Optical Visor with Light, Variable temperature soldering station with LED display, Complete Electronics Tool Kit

Test Equipment:

DMM (Digital Multimeter), Analogue Meter, the ESR Meter, the Ring Tester, the Oscilloscope, Leak Seeker, Smart Tweezers, Some Precautions

Multimeter:

Warning, Introduction-International Electrical Symbols, Product Features- Description, Control Features, Button Functions, Display Features, Rotary Functions, Operation- Turning the Multimeter ON, Turning the Multimeter OFF, Activating/Deactivating Auto-OFF, Auto and Manual Range Selection, Non-Contact Voltage (NCV), Voltage Measurement, Resistance Measurement, Continuity Test, Diode Test, Capacitance Test, Temperature Test, Current Measurement

Soldering:

What is soldering and when should you use it?, Materials and Equipment, Safety Precautions, Tips, Preparing To Solder, Soldering a Printed Circuit Board (PCB), Common Problems and Troubleshooting

Oscilloscope:

The Oscilloscope, common oscilloscope terms, controls and indicators, General Function Controls- Vertical Controls, Horizontal Controls — Sweep Group, Horizontal Controls —Triggering Group, advanced analog oscilloscopes, digital storage oscilloscopes (DSO), Oscilloscope Safety- Preventing Electric Shock, Preventing Damage to the Oscilloscope, operating an Oscilloscope- Initial Startup Procedure, Displaying a Signal, Dual-Trace Display

CTRT 5- Install The TV Set

Warranty information regarding television set; List of Features; Accessories; Viewing the Control Panel; Viewing the Remote Control; Plug & Play (Initial Setup); Installing Flat Panel Television - Preparing for Installation, TV Breakdown, Tools Required, Securing the installation space, Installing the LCD TV Stand, Installing the Wall Mount, Securing the TV to the Wall; Connections - Connecting to an Antenna, Connecting to an AV Device, Connecting to an Audio Device, Connecting to a PC, Network Connection; Basic Features - How to Navigate Menus, Channel Menu, Picture Menu, Sound Menu, Setup menu, Media Play; Other Information - Assembling the Cables, Troubleshooting, storage and Maintenance, Specifications

DRTT 6: Communication and Personality Development

Grammar : Parts of Speech, - Articles and Determines, Noun and Pronoun, Adjective and Adverb, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,

Written English: Advance Writing Skills (formal, informal paragraph, story, letter, application)

Personality development : Soft Skills Development, Body Language, Behavioral and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management

CTRT 7- Repair Dysfunctional CRT TV Set

CRT Television receiver: Television receiver fundamentals, TV Receivers- Subsystems of a television set, CRT Basics- Color CRTs - shadow masks and aperture grills, Degaussing (demagnetizing) a CRT, TV Placement and Preventive Maintenance- General TV placement considerations, Preventive maintenance

TV Troubleshooting: SAFETY, Safety guidelines, warning about disconnecting CRT neck board, troubleshooting tips, Test equipment, Removing the CRT HV connector, Safe troubleshooting techniques for line powered TVs, getting inside a TV, Specific considerations before poking around inside a TV or monitor, dusting out the inside of a TV, troubleshooting a TV with the main board disconnected

TV Adjustments: User picture adjustment, Internal adjustments, Focus adjustment, Adjustment of the internal SCREEN and color controls, Optimal procedure for setting brightness/background and screen adjustments, Color balance adjustment, More on 'Calibrating' TV color, Horizontal position, size, and linearity adjustment, Vertical position, size, and linearity adjustment, Pincushion adjustments, Geometry adjustment, Why is the convergence on my set bad near the edges, CRT purity and convergence problems, CRT purity adjustment, CRT convergence adjustment, Tilted picture, B/W TV size, position, and geometry adjustments,

Low Voltage Power Supply Problems: Low voltage power supply fundamentals, Standby power supplies, Totally dead set, Intermittently dead set - bad cord set, Fuse replaced but TV clicks with power-on but no other action, Power-on tick-tick-tick or click-click-click but no other action, No picture or raster and no sound, Reduced width picture and/or hum bars in picture and/or hum in sound, TV power cycling on and off, Dead TV with periodic tweet-tweet, flub-flub, or low-low voltage, Bypassing the Startup Circuit, Shorted Components, Startup problems - nothing happens, click, or tick-tick-tick sound, TV turns off after warming up, TV doesn't power up immediately, Old TV requires warm-up period, TV shuts down with bright picture or when brightness is turned up, TV shuts down with dark picture or when changing channels

Deflection Problems: Deflection fundamentals, Horizontal deflection shutting down, TV will not sync, Horizontal lock lost, Vertical lock lost, Part of picture cut off, Single Horizontal Line, Keystone shaped picture, Horizontal output transistors keep blowing (or excessively hot), Horizontal output transistors blowing at random intervals, Vertical fold over, Comments on vertical problems, Deflection yoke testing, Deflection yoke repair, Testing of fly back (LOPT) transformers, Horizontal or vertical flipped picture

High Voltage Power Supply Problems: HV power supply fundamentals, What is a Tripler?, High voltage shutdown due to X-ray protection circuits, Excessive low voltage supply may trigger high voltage shutdown, Low or no high voltage, Excessive high voltage, Snaps, crackles, and other HV breakdown, Fly back shot by 4 year old with water pistol, Blooming or breathing problems, Focus/Screen divider bypass surgery, Disconnecting fly back wire(s) from CRT driver board, Focus or screen voltage drifts after warm-up only when CRT is connected

Raster, Color, and Video Problems: No color - black and white picture, One color is too weak or too strong, No picture/dark picture/erratic picture, Shorts in a CRT, Rescuing a shorted CRT, Picture tube replacement, High voltage to focus short, Dark picture, Brightening an old CRT, Picture tube brightener, Color balance changes across screen from left to right, Bleeding highlights, Brightness changes from left- to-right across screen, Excessive brightness and/or washed out picture, Bad focus

(fuzzy picture), Focus drift with warm-up, Bad focus and adjustment changes brightness, Blank picture, good channel tuning and sound, Color rings - bulls eye pattern, Color TV only displays one color, Vertical brightness or color bars

Tuner, AGC, and Sync Problems: No reception from antenna or cable, Picture is overloaded, washed out, or noisy, jumping picture on white scenes, Channel tuning drifts as set warms up, Noise in picture and sound due to bright scene, Internal interference - switch mode power supplies and digital circuitry, Those darn rabbit ears, Herringbone lines in picture, EM or RFI hell?

Audio Problems: Picture fine, no audio, Weak or distorted audio, Buzzing TV, Chattering yoke, High pitched whine or squeal from TV with no other symptoms, Reducing/eliminating yoke noise, Whining when off?

Miscellaneous Problems: General erratic behavior, Wiring transmitted interference, Jittering or flickering due to problems with AC power, TV blows fuses or trips breakers or worse when A/V connections are made, TV displays black box with normal picture border, Strange codes appearing on TV screen, TV was rained on, Setup menus will not go away or hieroglyphics on screen, Setup adjustments lost - TV service codes, TV has burning smell, Static discharge noise and picture tube quality, Revival of dead or tired remote control units, Problems with the IR remote receiver, Loudspeakers and TVs, Phantom spot or blob on CRT after set is shut off, Shock and/or spark when connecting cable or other A/V components

CTRRT 8- Repair Dysfunctional Flat Panel Display (FPD) TV Set

Liquid Crystals, Liquid Crystal Displays, The Power Supply Board, The Inverter Board, The Main Board, The Controller/T-Con Board, The LCD Driver Board, The Standby Circuit, Tools, Test Equipment, Schematic Diagrams, Understanding and Testing Resistors, Understanding and Testing Capacitors, Understanding and Testing Inductors, Understanding and Testing Transistors, Understanding and Testing Diodes, Understanding and Testing Bridge Rectifiers, Understanding and Testing LEDs, Understanding and Testing Switching Transformers, Understanding and Testing Opto-Isolators, Understanding and Testing Voltage Regulators, Understanding and Testing Switches, Understanding and Testing Fuses, Some Testing Tips, Useful Formulas, How to Disassemble an LCD TV, Voltage Test Points, Connection Problems, PSU (Power Supply Unit) Failures, Inverter Board Failures, Main Board Failures, No Video, No Audio, OSD/Menu Failure, White Screen, Rainbow Screen, Screen Flashes Then TV Shuts Down, No Back light, Lines in Picture, Cracked Panel, LCD TV Repair Case Histories, Safety

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self-study	Practical	Assignments
1	CTR1	Basic Electrical and Electronics	2	60	8	22	12	18
2	CTR2	Basic Concept of Television System	2	60	8	34	-	18
3	CTR3	Safety Practices in the Work Environment	1	30	4	11	6	9
4	CTR4	TV Servicing Tools and Equipments	3	90	12	33	18	27
5	CTR5	Installation of TV set	1	30	4	11	6	9
6	CTR6	Communication and Personality Development	1	30	4	17	-	9
7	CTR7	Repairing of CRT TV set	3	90	12	33	18	27
8	CTR8	Repairing of Flat Panel Display (FPD) TV set	3	90	12	33	18	27

Study Modules & Books Information

S. No.	Course Code	Subject Name	Modules to be used
1.	CTRTRT 1	Basic Electrical and Electronics	Basic Electrical and Electronics, NIMI, Chennai
2.	CTRTRT 2	Basic Concept of Television System	Audio Video and T. V. Engineering by Ajay Sharma
3.	CTRTRT 3	Safety Practices in the Work Environment	S69 - Safety Practices, Primary Health and Personal Hygiene
4.	CTRTRT 4	TV Servicing Tools and Equipments	Audio Video and T. V. Engineering by Ajay Sharma
5.	CTRTRT 5	Installation of TV set	Audio Video and T. V. Engineering by Ajay Sharma
6.	CTRTRT 6	Communication and Personality Development	S68 - Effective Communication and Personality Development
7.	CTRTRT 7	Repairing of CRT TV set	Audio Video and T. V. Engineering by Ajay Sharma
8.	CTRTRT 8	Repairing of Flat Panel Display (FPD) TV set	Audio Video and T. V. Engineering by Ajay Sharma

**CERTIFICATE IN COMPUTER
HARDWARE ENGINEERING (CCHE)**

Certificate in Computer Hardware Engineering (CCHE)

दिए गए विषयों में से एक को चुनकर (CCHE)

(A) Duration : 6 Months

1/2 वर्ष : 6 महीने

(B) Eligibility : 12th Pass

1/2 कक्षा : 12वीं कक्षा

(C) Contents and Scheme of Examination

1/2 वर्ष में एक से अधिक परीक्षाएं; कुल

(D) Courses : 07

1/2 कक्षा : 07

(E) Credit : 16

1/2 सेमीस्टर : 16

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
CCHE1	Fundamental of Computers & Information Technology सूचना तकनीक एवं कम्प्यूटर से परिचय	3	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Understand the functions, characteristics and basic components of a computer system and Operating System. Know-how of various peripherals, storage devices and understand their physical structure & working.
CCHE2	Safety Practices in the Work Environment कार्यस्थल पर सुरक्षा प्रबंध	1	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Familiarity with electrical safety, fire safety, first aid, food safety, primary health and basic hygiene
CCHE3	Assembly of PC पी.सी. की असेम्बली	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand basic parts/modules of computer. Demonstrate assemble / de-assemble procedure of computer. Basic fault diagnosis.
CCHE4	PC Installation and Maintenance पी.सी. इन्स्टालेशन एण्ड मेंटेनेंस	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand installation process of operating system. Understand hard disk partitioning fundamentals. Understand and demonstrate software installation and removal.

CCHE5	Basic & Digital Electronics बेसिक एण्ड डिजिटल इलेक्ट्रॉनिक्स	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand basics of electronics and electronic devices with their function and characteristic. Identify various types of circuit boards and component mounting process Proficiency in using analog and digital testing tools.
CCHE6	Computer Hardware Maintenance कम्प्यूटर हार्डवेयर मेंटेनेंस	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand function and installation of various I/O devices Use and installation of power supporting devices
CCHE7	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	1	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Basic communication skills Personality grooming

Note : For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
700	280

Detailed Syllabus

CCHE 1 - FUNDAMENTAL OF COMPUTERS AND INFORMATION TECHNOLOGY

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic components of a computer system - Control unit, detailed functions of ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

Input/Output & Storage Units:-Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers& types – Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, SIMM, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk, Blue Ray Disc, SD/MMC Memory cards, Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW.

Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux, File Allocation Table (FAT & FAT 32), NTFS files & directory structure and its naming rules, booting process details of DOS and Windows, DOS system files Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention, viruses on network.

Use of communication and IT, Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band, Types of Network - LAN, WAN, MAN, Internet, VPN etc. , Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways.

CCHE 2 – SAFETY PRACTICES IN THE WORK ENVIRONMENT

Safety Signs & Colour at Work : Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Colour- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, First aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, First-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

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Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure : Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work : Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene : Introduction, How to maintain good hygiene, How to ensure food safety, Grooming, What are the consequences of not maintaining good hygiene?

Public and Home Safety : Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing , Food safety in the home, Food borne diseases.

CCHE 3 - ASSEMBLY OF PC

- Introduction of Assembling & Disassembling.
- Difference between branded and assembled computer.
- Components required for Assembling & Disassembling a PC.
- Detail of components required for Assembling & Disassembling a PC.
- Tools used for assembling. & disassembling.
- Steps for Assembling a PC.
- Install the power supply and check it. .
- Install the components on motherboard - CPU, Heat sink / fan assembly, RAM.
- Install the motherboard.
- Install internal drive-Hard Disk.
- Install drives in external ways- Optical Drive and Floppy Drive.
- Install adapter Cards- NIC, Video adapter & Sound.
- Connect all internal cables - Power cables and Data cables.
- Connect all front panel indicators, switches and cables.
- Close the cabinet.
- Connect all peripherals – Keyboard, Mouse, Monitor, Speaker, Printer, etc.
- Steps for Disassembling a PC.
- Precautions used while Assembling & Disassembling a PC.
- Final check before Booting.
- Testing –Boot Computer for the first time, identify beep codes and BIOS setup.
- Troubleshooting.

CCHE 4 - PC INSTALLATION AND MAINTENANCE

INSTALLATION:

- Operating System Basics.
- Basic concepts of operating systems- Desktop, Network, Server.
- Determine minimum hardware requirements and compatibility with the OS
- Characteristics of modern operating systems.
- Booting of system from DOS/Windows
- Fundamentals of Hard Disk Partitioning and Formatting Hard Disk using F-disk/ Disk Manager
- Using desktop operating system (DOS/ Windows).
- Identify applications and environments that are compatible with an operating system
- Installation of operating system, Installation of Multiple Booting (Win-XP, VISTA Media Center, Win-7 O.S)
- Installation of Different Drivers (Sound, display, USB Devices, Printer, Scanner, Web Camera, TV Tuner Card, Modem, Modem Setting)
- Importance of rebooting
- Installation of Application Software, (MS OFFICE 2003/MS OFFICE 2007, Visual Studio, Java, Auto Cad etc)
- Installation of DTP Software (Photoshop, Corel, PageMaker, etc.)
- Installation of Media Players (Adobe Flash Player, Real Player, Jet Audio, Power DVD)
- Installation of Nero and Other Optical Disk Writer.
- Installation of Anti-Virus, Scan Virus File & Folder, Repair Virus File & Folder.
- Create a Rescue Disk,
- Installation of Acrobat Reader, WinZip, Win-RAR etc.

MAINTENANCE:

- Identify and apply common preventive maintenance techniques for operating systems
- Create a preventive maintenance plan
- Schedule a task- Taking Backup of data and Restore the backup in the hard drive
- Updating of antivirus patches
- Troubleshoot operating systems- Review the troubleshooting process, Identify common problems and solutions
- Use of Control Panel.
 - Desktop Customization.
 - Managing User Accounts and Application.
 - Disk Management.
 - Disk Cleanup and Disk Defragmentation Utility.
 - Device Manager.
 - Bit Locker.

- Windows Firewall Setting.
- Recovery and Backup.
- Policies and Services.
- Network Setting.
- File and Folder Sharing.
- Resources Sharing.
- Services Sharing.
- Remote Desktop.
- Remote Assistance.
- Use of System Tools

CCHE 5 - BASIC AND DIGITAL ELECTRONICS

Conductors – definition, properties of conductors, uses of conductors; Insulators – definition, properties of insulators, uses of insulators.

Semiconductors – atomic structure of semiconductors, types of semiconductors - N-type semiconductor, P-type semiconductor, PN junction

Active Components – transistor, diodes, silicon controlled rectifier (SCR), diac, triac, bridge rectifier or diode bridge, uni-junction transistor (UJT), field effect transistor (FET)

PN Junction Diodes – PN junction, biasing the PN junction-forward bias & reverse bias, V-I characteristics of PN junction, application of diodes, diode equivalent, classification of diodes, types of diode packaging; Diode Valve – diode valve, cathode, anode

Rectifiers – purpose of a rectifier, half wave rectifier, full wave rectifier, bridge rectifier, comparison of half wave, full wave and bridge rectifiers

Filter Circuits – introduction, types of filter circuits-capacitor filter, RC filter, series inductor filter, choke input LC filter, PI-filter (p filter)

Zener Diode – introduction, VI characteristics of a zener diode, avalanche break down, zener break down, specifications of zener diodes, applications of zener diode

Relays – relay, types of relays-electromagnetic relays, current sensing relay, under-current relay, voltage sensing relay, latching relays, mechanical reset relays, electrical reset relays, reed relays, dry reed relay, ferreed relay mercury wetted contact relay, impulse relay, clapper type armature relay, thermal relay, Poles and contacts, AC relay, Causes of relay failures

Digital system – introduction and examples, ; Terminology of digital ICs; Types of IC packages-dual in line package (DIP), ceramic flat package, surface mount package, ceramic chip carrier package, pin grid array package; Logic family-TTL logic family, emitter-coupled logic (ECL) circuits, MOS, CMOS; Digital IC numbering system

Number Systems – introduction, potential notation and weightage, decimal to binary conversion, counting binary number, hexadecimal number system, hexadecimal number system, octal number, invalid code, inverters (NOT gate), transistor inverter

Logic Probe – introduction, malfunctioning in the internal circuitry, logic probe using inverters, ones complement circuit using inverters

OR Gate – systematic symbol and truth table, electrical equivalent circuit, 2-input OR gate using diode, simple applications of OR gate; NOR Gate - systematic symbol and truth table

Flip Flop – introduction, R-S latch (reset-set latch), timing diagram, astable multivibrator using NOR gates

AND Gates : Introduction of AND gate and its truth table, Electrical equivalent circuit of an AND gate, AND gate as an enable / inhibit device; NAND Gate : Introduction of NAND gate and its truth table, Pulsed operation, Logic pulser.

EX-OR Gate : Exclusive – OR gate, Four input EX-OR gate, Parity; EX-NOR Gate : Introduction, EX-OR gate as a two-bit adder, Exclusive – OR gate using discrete gates, Application.

Flip Flop : Introduction, RS flip flops, NOR latch, NAND latch, Clocked RS flip flop, D flip flop, Contact bounce circuit, Bounceless switch, Clocked D flip flop, Edge triggering versus level clocking, Edge triggered D flip flop, Variable, Complements, Literal, Boolean addition, Boolean multiplication, Laws of Boolean algebra-commutative law, associative law and distributive law, Boolean algebra rules, De-morgan's theorem, Simplification of Boolean equation, Simplification of logic circuit using Boolean function, Universal property of NOR gate and NAND gate

J. K. Flip Flop Circuits : Operation of J. K. flip flop, Truth table, Master slave flip flop, Frequency division using flip flop

Shift Registers and Their Applications : Introduction to shift registers, Types of registers

BCD Decoders and Their Applications : Cascaded counters, DM7490 decade counter, Decoder – the 4 bit decoder, BCD to decimal decoder, 7441 BCD to 7 segment decoder/driver, Lamp test, Zero suppression, 7-Segment display, LED display, LCD display

Binary Arithmetic : Binary addition, Signed numbers-sign-magnitude system, 1's complement system, 2's complement system, Binary adder-half adder, full adder, , Four bit parallel adder, 74LS83 4 bit parallel adder, Binary subtraction, Adder-subtractor

Multiplexer : Introduction, basic representation and truth table, 8-line multiplexer, Demultiplexer - explanation, 8-line demultiplexer, Application of multiplexers and demultiplexers

Analog to Digital Converter : Introduction, Successive-approximation A/D converter, Analogue to digital converter ADC0808/0809 8 bit microprocessor compatible A/D converter

Interfacing the Digital and Analog Signals : Digital and analog signals, Digital to analog converter, CD player-an example of D to A converter, R/2R ladder digital to analog converter, Performance characteristics of digital to analog converter, DAC 0808 digital to analog converter, Grounding and bypassing

Simple Interruption Counter : Circuit diagram of interruption counter, Explanation of circuit diagram

Multiplexed Displays : Multiplexing, Multiplexing of four digit display

Encoder : Block diagram, truth table and circuit

Priority Encoder : 4:2 Bits priority encoder, 8:3 Bits priority encoder, A hierarchical priority encoder, Encoder applications-keyboard encoders, positional encoders, interrupt requests

Printed Circuit Boards : Etching, Drilling holes on PCBs, Preparing and marking component layout, Mounting components on PCB, Preparation of components leads, Shaping the component leads, Source of stress on components, Stress relief measures, Bending and trimming excess lead length for soldering, Order of soldering components

CCHE 6 – COMPUTER HARDWARE MAINTENANCE

- **PERSONAL COMPUTER COMPONENTS**

- Introduction to Computer, Components of Computer, Difference between Hardware & Software components, Classification of Hardware components, Functional Unit of Computer (Input Unit, Output Unit, Processing Unit, Storage Unit, Infrastructure Unit), Uses and Devices of all functional units.

- MICROPROCESSOR
 - Introduction, Working of Microprocessor, Organization of Microprocessor, Generation of Microprocessor, Types of Microprocessor (P-I, P-II, P-III, P-IV & Celeron, AMD, HT-Supported CPU, Normal CPU, Mobile CPU, Centrino CPU, Dual Core CPU, Quad Core CPU, Core i3, core i5, core i7, etc), Indent the Microprocessor (Clock Speed, FSB, L2 Cache), Operating voltage of Microprocessor, Microprocessor Speed, Microprocessor Packaging, Installation of Microprocessor, Upgrading the Microprocessor, Microprocessor Troubleshooting.
- MEMORY
 - Introduction, Nature of Memory (Volatile Memory and Non-Volatile Memory), Classification of Memory (Physical, Virtual, Logical, Flash, Cache), Types of Physical Memory (RAM, SRAM, DRAM, DR-1 RAM, DR-2 RAM, DR-3 RAM, ROM, PROM, EPROM, EEPROM, CD, DVD, BD, etc.), Difference between types of memory, Identify types of memory, Memory Packaging, Installation of Memory, Memory Troubleshooting.
- MOTHERBOARD
 - Introduction, Types of Motherboard (Integrated Motherboard, Non-Integrated Motherboard), Form Factor of Motherboard (AT Motherboard, ATX Motherboard), Motherboard Components (Slots, Sockets, Ports, Connectors, Chipsets, Busses), Uses of Busses, Bus Standards, Uses of Chipsets, Types of Chipsets (North bridge, South bridge, Super I/O Chip, Audio Codec Chip etc.), Types of Ports (PS/2, USB, Fire wire IEEE-1394, Serial, Parallel, LPT, VGA, HDMI, RJ-45, RJ-11, etc.), Types of Slots (SIMM, DIMM etc.), Types of Socket (PGA, LGA etc.), Types of connectors (SATA, IDE, Floppy Disk, CPU Fan, Jumper, Power connector etc.)
- HARDDISK
 - Introduction, Types of Hard disk (SATA, PATA, SCSI, SSD, e-SATA, Wireless Hard disk etc.), Difference between types of hard disk, Components of Hard disk, Partition of Hard disk (Primary and Logical), Formatting of Hard disk (High Level and Low Level Formatting), Hard disk Troubleshooting.
- SMPS
 - Introduction, Components of SMPS, Working of SMPS, Output Voltages of SMPS, Control signal of SMPS, Power connectors of SMPS, Form Factor of SMPS, Factor considering before selecting a SMPS, Installation of SMPS, Troubleshooting of SMPS.
- OPTICAL DISK
 - Introduction, Types of Optical Disk (CD, DVD, BD), Types of Optical Disk Drive, Types of CD/ DVD/ BD (CD-ROM, CD-R, DVD-ROM, DVD-R, DVD-RW, BD-R, BD-RW), Layers of Optical Disk, Components of Optical Disk Drive, Working of Optical Disk Drive, Installation of Optical Disk Drive, Troubleshooting of Optical Disk Drive.
- KEYBOARD & MOUSE
 - Working of Keyboard, Types of Keyboard (Windows, Ergonomic, Programmable, Multimedia, Cordless, Bluetooth, etc.), Types of Keyboard Keypads (Alphanumeric, Punctuation, Navigation, Windows, Function, Numeric, Modification, Special), Keyboard Technology, Keyboard Connectors, Troubleshooting of Keyboard.
 - Mouse, Types of Mouse (Optical, Laser, Cordless, Bluetooth), Mouse Connectors, Working of Mouse, Troubleshooting of Mouse.
- PRINTER
 - Introduction, Difference between Impact and Non-Impact Printers, Identify different parts of Printers, Working of Dot Matrix Printer, Working of Inkjet Printer, Working of Laser

Printer, Working of Thermal Printer, All-in-One Printer, Printer Installation, Troubleshooting the Printers.

- **SCANNER**

- Introduction, Types of Scanners (Flatbed, Sheet-fed, Slide, Drum), Parts of Scanners, Working of Scanners, Installation of Scanner, Scanner Configuration, Scanner Troubleshooting.

- **MONITOR**

- Introduction of Monitor, Types of Monitor (CRT, LCD, TFT, LED, Plasma etc.), Types of CRT Monitors-(Monochrome Monitor, Gray-Scale Monitor, Color Monitor), Block diagram of Monitors, Features of Monitor (Size, Resolution, Contrast Ratio), Monitor Settings (Brightness, Contrast, Horizontal Size, Vertical Size, Horizontal Position, Vertical Position, Degauss, Language, Corner/Trapezoid Correction, Pots), Connectors (VGA, DVI, S-Video, HDMI), Monitor Installation, Monitor Testing, Features of Video Adapter, Components of Video Adapter, Types of Display Cards (AGP, PCI, PCI-e), TV Tuner Card, Video Capture Card, Video Adapter Installation, Projector, Monitor Troubleshooting.

- **UPS**

- Introduction of UPS, Relay switch, Transformer Working, Fundamental of UPS & UPS Block Diagram, AVR Stage, Voltage Regulator Stage, Charger Stage, Oscillator Stage, Switching Stage, AC low & High Sensor stage, AC/DC Selector Stage, Battery Low Stage, battery deep discharge protection stage.

- **BIOS**

- Introduction, Difference between Software and Firmware, BIOS Manufacturing (AMI. Award, MR BIOS, Phoenix Technology), Accessing the BIOS, BIOS functions, BIOS Packaging (DIP, PLCC), CMOS Setup, BIOS Setup Utility, Controlling Option of BIOS Setup, Clearing the CMOS.

- **SERVER HARDWARE**

- Introduction, Difference between Server and PC, Server Hard disk - SCSI, Server RAM - RDRAM, Server Microprocessor - Xeon etc, Components of Servers, Types of Servers (Entry level, Middle Range and High End), Hot swappable Devices, RAID Controller, Troubleshooting of Server PC.

CCHE 7 – COMMUNICATION AND PERSONALITY DEVELOPMENT

Grammar:

Parts of Speech, - Articles and Determines, Noun and Pronoun, Adjective and Adverb, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,

Written English:

Advance Writing Skills (formal, informal paragraph, story, letter, application,

Personality development: Soft Skills Development, Body Language, Behavioral and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CCHE 1	Fundamental of Computers and Information Technology	3	90	12	51	-	27
2	CCHE 2	Safety Practices in the Work Environment	1	30	4	11	6	9
3	CCHE 3	Assembly of PC	3	90	12	33	18	27
4	CCHE 4	PC Installation and Maintenance	3	90	12	33	18	27
5	CCHE 5	Basic and Digital Electronics	2	60	8	22	12	18
6	CCHE 6	Computer Hardware Maintenance (CHM)	3	90	12	33	18	27
7	CCHE 7	Communication and Personality Development	1	30	4	17	-	9

Study Modules & Books Information

Sr. No	Course Code	Subject Name	Modules to be used
1	CCHE 1	Fundamentals of Computers and Information Technology	S01 - Fundamentals of Computers and Information Technology
2	CCHE 2	Safety Practices in the Work Environment	S69 : Safety Practices, Primary Health and Personal Hygiene
3	CCHE 3	Assembly of P.C.	1). Computer Hardware Course, BPB Publication 2). Comdex Hardware and Networking Course Kit, Dreamtech
4	CCHE 4	P.C. Installation & Maintenance	1). Computer Hardware Course, BPB Publication 2). Comdex Hardware and Networking Course Kit, Dreamtech
5	CCHE 5	Basic & Digital Electronics	3) V25 : Basic Electronics, AISECT (Hindi) 4) V26 : Digital Electronics, AISECT (Hindi) 3). Basic Electronics, NIMI, Chennai (English) 4). Basic Digital Electronics, NIMI, Chennai (English)
6	CCHE 6	Computer Hardware Maintenance	1). Computer Hardware Course, BPB Publication 2). Comdex Hardware and Networking Course Kit, Dreamtech
7	CCHE 7	Communication and Personality Development	S68 : Effective Communication And Personality Development

**CERTIFICATE IN MOTOR AND
TRANSFORMER WINDING
(CMTW)**

Certificate in Motor and Transformer Winding (CMTW)

सर्टिफिकेट इन मोटर एवं ट्रांसफार्मर वाइंडिंग (CMTW)

(A) Duration : 06 Months (D) Courses : 07
 1/2 vof/k : 06 ek 1/2 dk 1 : 07

(B) Eligibility : 10th Pass (E) Credit : 16
 1/2 i k-rk : 10o h i k 1/2 Ø f M V : 16

(C) Contents and Scheme of Examination

1/2 i k; Ø e fo" k l ph , oai j h k ; k u k

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
CMTW1	Introduction to Motors and Transformers मोटर्स एवं ट्रांसफार्मर्स से परिचय	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand the working principles and construction of D. C. and A. C. motors Understand single phase and three phase transformers
CMTW2	Single Phase AC Electric Motors and their Winding सिंगल फेज ए.सी. इलेक्ट्रिक मोटर्स एवं उनकी वाइंडिंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Skill in winding of single phase A. C. motors
CMTW3	Safety Practices in the Work Environment कार्यस्थल पर सुरक्षा प्रबन्ध	1	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Familiarity with electrical safety, fire safety, first aid, food safety, primary health and basic hygiene

CMTW4	Three Phase AC Electric Motors and their Winding श्री फेज ए.सी. इलेक्ट्रिक मोटर्स एवं उनकी वाइंडिंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Skill in winding of three phase A. C. motors
CMTW5	DC Motors and their Winding डी.सी. मोटर्स एवं उनकी वाइंडिंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Skill in winding of D. C. motors
CMTW6	Transformers and their Winding ट्रांसफार्मर्स एवं उनकी वाइंडिंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Skill in transformer winding
CMTW7	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	1	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Basic communication skills Personality grooming

Note : For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
700	280

Detailed Syllabus

CMTW 1: Introduction to Motors and Transformers

D.C. Motor : Principle, construction, torque and speed, Fleming's left hand rule, Types of D. C. motor, their working, starting and speed control – series wound motor, shunt wound motor, compound wound motor, speed control of D. C. motors, starting of D. C. motors.

A. C. Three Phase Motor : Constructional features of three phase induction motor – stator, outer frame, stator core, stator winding, rotor, squirrel cage rotor, phase wound rotor, Production of rotating magnetic field and working principle, Torque, synchronous speed, rotor speed and slip – torque, synchronous speed, rotor speed, slip, Types of induction motor and their working – types of induction motor, squirrel cage induction motor slip ring induction motor, Different types of starters – direct on line starter, star delta starter, slip ring motor starter, Reversing of A. C. three phase motors.

Single Phase Motors : Principle of single phase motor and necessity of two windings, Classification of single phase motor – induction type motors, commutator type motors, Working principle of split phase motor, capacitor type induction motor and use of centrifugal switch and capacitor - split phase motor, capacitor type induction motors, General applications of capacitor motors, Use of centrifugal switch, capacitor, General principle and construction of universal motor, shaded pole motor and repulsion motors - universal motor, shaded pole motor, repulsion motor.

Single Phase Transformer : Introduction, Transformer and its main parts – primary winding, secondary winding, core, Principle of transformer and its types as per voltage - step down transformer, step up transformer, EMF equation and transformation ratio.

Three Phase Transformer : Introduction, Constructional details of transmission and distribution transformer – transmission transformer, distribution transformer, Construction and working of conservator, breather and Buchholz relay – conservator, breather, Buchholz relay, Different system of cooling of three phase transformers – natural air cooling, natural oil cooling, , forced air cooling, oil blast cooling, forced water cooling.

CMTW 2: Single Phase AC Electric Motors and their Winding

Single Phase Motor Winding : Method of rewinding the stator of capacitor type induction motor – winding of stator of capacitor type induction motor, method of rewinding,

Procedure for rewinding of permanent capacitor type motor – ceiling fan, table fan, cooler fan motor,

Rewinding procedure of universal motor, shaded pole motor and repulsion motor.

CMTW 3: Safety Practices in the Work Environment

Safety Signs & Colour at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Colour- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, First aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, First-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting, Manual lifting techniques using kinetic method, Shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure: Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work: Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene: Introduction, how to maintain good hygiene, how to ensure food safety, Grooming, what are the consequences of not maintaining good hygiene?

Public and Home Safety: Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing, Food safety in the home, Food borne diseases.

CMTW 4: Three Phase AC Electric Motors and their Winding

Terms and definitions used in winding – inductor, end turn, turns, coil, coil side, coil lead, coil group, half coil winding, full coil winding, single layer winding, double layer winding, pole pitch, coil pitch, full pitch winding, long pitch winding, short pitch winding, Different types of connections used in winding, Connections for three phase motors – coil connections, group connections, phase connections,

Types of winding based on shape of coils – flat loop winding, concentric winding, chain winding, basket winding, diamond coil winding, involute coil winding, skew winding, skein winding, Balanced, unbalanced winding and calculating degree per slot - balanced and unbalanced winding.

Procedure for rewinding old motor, and understanding different datas for rewinding – procedure for rewinding old motor, Winding methods – hand winding, form winding, skein winding, procedure for rewinding old motor, and understanding different datas for rewinding, Preparing winding table and development diagram of 3 phase winding, Connection – coil connection, group connection, phase connection, Procedure for rewinding of double voltage and double speed motor – double voltage motor, two speed motor,

Method of testing motors after rewinding – open circuit, short circuit, leakage fault or earth fault.

Baking and Varnishing : Baking and varnishing the stators winding – baking, varnishing, Baking of windings in baking oven.

CMTW 5: DC Motors and their Winding

Fundamental terms used in winding – turn, active side, inactive coil side, leads of coil, coil span or coil throw, coils per pole.

Different types of pitches used in winding – pole pitch, coil pitch or winding pitch, full pitched winding, short chorded winding, long chorded winding, back pitch, front pitch, commutator pitch.

Different types of connections and layers in windings – progressive connections, retrogressive connections, symmetrical connections / winding, unsymmetrical connections / winding, layers of winding, single layer winding, double layer winding, multiple coil winding.

Types of D. C. armature winding as per armature core – ring type armature, drum type armature, hand winding, formed coil winding, Classification of DC winding – lap winding, wave winding.

CMTW 6: Transformers and their Winding

Single Phase Transformer : Construction and working of potential transformer, current transformer and clip on motor – potential transformer, current transformer, clip on meter, Working principle, construction and uses of auto transformer – step down auto transformer, step up auto transformer, Applications of different types of single phase transformer, Transformer losses and efficiency, Method of determining losses.

Different methods of connecting the windings of three phase transformers – three phase transformers, star connection, delta connection, Parallel operation of transformers

Transformer Winding : Designing a small transformer on the basis of output and core area, Size of wire used in primary and secondary windings,

Winding the transformer.

CMTW 7: Communication and Personality Development

- **English Grammar** : Parts of Speech, - Articles and Determines, Noun and Pronoun, Adjective and Adverb, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,
- **Written English** : Advance Writing Skills (formal, informal paragraph, story, letter, application,
- **Personality development** : Soft Skills Development, Body Language, Behavioral and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management

Counseling and Study Structure

S. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CMTW 1	Introduction to Motors and Transformers	2	60	8	22	12	18
2	CMTW 2	Single Phase AC Electric Motors and their Winding	3	90	12	33	18	27
3	CMTW 3	Safety Practices in the Work Environment	1	30	4	11	6	9
4	CMTW 4	Three Phase AC Electric Motors and their Winding	3	90	12	33	18	27
5	CMTW 5	DC Motors and their Winding	3	90	12	33	18	27
6	CMTW 6	Transformers and their Winding	3	90	12	33	18	27
7	CMTW 7	Communication and Personality Development	1	30	4	17	-	9

Study Modules & Books Information

S. No.	Course Code	Subject Name	Modules to be used
1	CMTW 1	Introduction to Motors and Transformers	i) V 02 : Motor and Transformer Winding
2	CMTW 2	Single Phase AC Electric Motors and their Winding	ii) V 36 : Electrical Technician - Transformer & Motor Re-winding and Pump Operation & Maintenance
3	CMTW 3	Safety Practices in the Work Environment	S69 : Safety Practices, Primary Health and Personal Hygiene
4	CMTW 4	Three Phase AC Electric Motors and their Winding	i) V 02 : Motor and Transformer Winding
5	CMTW 5	DC Motors and their Winding	ii) V 36 : Electrical Technician - Transformer & Motor Re-winding and Pump Operation & Maintenance
6	CMTW 6	Transformers and their Winding	
7	CMTW 7	Communication and Personality Development	S68 : Effective Communication And Personality Development

**CERTIFICATE FOR ADVANCE
NETWORKING (CAN)**

Certificate for Advance Networking (CAN)

सर्टिफिकेट इन एडवांस नेटवर्किंग (CAN)

(A) Duration : 6 Months (D) Courses : 08

1/2 vof/k : 6 ek 1/2 dk 1 : 08

(B) Eligibility : 12th Pass (E) Credit : 16

1/2 ikrk : 120mk 1/2 ØfMV : 16

(C) Contents and Scheme of Examination

1/2 iB; Øe fo"k l ph , oaijhkk ; k uk

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
CAN 1	Advance Networking एडवांस नेटवर्किंग	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Narrate network concepts and terminology Identify, install and configure various network components and devices. Understand WAN communication. Understand various protocols and current technologies used for communication.
CAN 2	Safety Practices in the Work Environment कार्यस्थल पर सुरक्षा प्रबंध	1	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Familiarity with safety practice at workplace. Knowledge about various hazards and their remedies. Ensure clean, dust free and organized working environment. Knowledge of Primary first aid for any accidental situation. Understand about personal health and hygiene.
CAN 3	Windows 7- Installation and Configuration	2	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand installation process of operating system. Install and uninstall of various software.

	विंडोज़ 7 – इन्स्टॉलेशन एण्ड कॉन्फिगरेशन									
CAN 4	Windows 2008 Server Management विंडोज 2008 सर्वर मैनेजमेंट	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand installation process and configuration of Windows 2008 server. Understand configuration of various components especially Active Directory, File Server, Web Server etc. Managing Windows 2008 server environment with group policy and clients management. Understand basic server maintenance task.
CAN 5	Linux Administration लाइनेक्स एडमिनिस्ट्रेशन	3	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Understand installation and configure a Linux system. Setting up LAN under Linux environment. Configuration of Web Server, mail server, DNS, Proxy etc. under Linux environment. Understand basic server maintenance task.
CAN 6	IT Infrastructure Management आईटी इन्फ्रास्ट्रक्चर मैनेजमेंट	2	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Knowledge of various process flow adopted by IT companies. Understand management of IT infrastructure. Knowledge of ITIL process adopted by IT companies.
CAN 7	Working with MS Office वर्किंग विथ एमएस ऑफिस	1	100	50	20	20	8	30	12	<ul style="list-style-type: none"> Creation and editing of a document. Understand various features of MS-Office and their use. Understand and use of outlook express. Understand printing of various documents.
CAN 8	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	1	100	70	28	-	-	30	12	<ul style="list-style-type: none"> Basic communication skills. Personality grooming. Responding to customer queries effectively. Understand customer's requirements.

Note: For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
800	320

Detailed Syllabus

CAN 1 – ADVANCE NETWORKING

Introduction to Communication, Serial and Parallel communication, Introduction to Simplex, Half-Duplex and Full-Duplex network communication, Difference between Unicasting, Broadcasting and Multicasting communication method

Introduction to Network and Networking, Advantage and Disadvantages of Networking, Types of network configuration - (Client-Server model and Peer-to-Peer model), types of computer network- LAN, WAN, MAN, CAN, SAN, PAN, etc., Introduction to Open System Interconnection (OSI) Model, Layers of OSI Model, Role of each layer, Difference between OSI Model and TCP/IP Model, Introduction to Network Topologies, Types of Topologies (Bus, Star, Mesh, Ring, Tree, Hybrid), Structure of each topology, Advantage and Disadvantage of topologies.

Internetworking devices- -NIC, Hub, Switch, Router, Gateway, etc; Introduction to transmission media, Characteristics of Cables, Types of Cables- (Copper Cable and Optical Fiber Cable), Types of Copper Cable- (STP, UDP, Thin-net, Thick-net), Types of Optical Fiber Cable- (Mono-mode and Multi-mode), Advantage and Disadvantage of types of Cables, Crimping and cabling.

Introduction to software components, intranet works and Internetwork Devices, Types of software components- (Network Operating System, Drivers, Protocol, Services, Addresses), Introduction to types of Network Operating System, Types of Network Protocols- (Communication Protocol, Hardware Dependent Protocol, Software Dependent Protocol), Types of Protocol Services- (File & Printer, Multimedia, Email, WWW, etc.).

IP Address, MAC Address, Port Address, IP Address classification, Difference between IPv4 & IPv6, Difference between Physical Address and Logical Address, Difference between Static and Dynamic configuration, Difference between Public and Private IP Address. Sub netting fundamentals, Sub netting in class A, B & C

Introduction to Internet, History of Internet, working on Internet, Introduction to Broadband Connection, Introduction to ADSL Connection, Introduction to Data Card Connection, sharing an Internet Connection, Introduction to E-mail, Creating an E-mail account;

Introduction to Wireless Networking, Difference between wired and wireless network, Introduction to Wireless Standard-(IEEE 802.11), Wireless Networking Components- (Medium, Access Point, Wireless Router, Antennas, Adapters, etc.), Types of Wireless Network- (Ad-Hoc Network, Infrastructure wireless LAN).

Communication over the network, Application layer functionality and protocols, OSI transport layer, OSI network Layer, Addressing the network IPv4, Data Link Layer, OSI physical Layer, Ethernet, Planning and cabling networks, Configuring and Testing your network, Introduction of routing and packet forwarding, Static routing, Introduction to dynamic routing protocols, Distance vector routing protocols, RIP version 1, VLSM and CIDR, RIPv2, The routing table A Closer Look, EIGRP, Link state routing protocols, OSPF, LAN Design, Basic switch concepts and configuration, VLANs, Spanning tree protocol, Inter-VLAN routing, Introduction to WAN, Basic wireless concepts and configuration, Point to point protocol, Frame Relay, Network Security, ACLs, Network troubleshooting, Physical Access Controls, Encryption Technologies, Overview of firewalls and proxy servers, Auditing Security related Events in Windows XP & Windows 7,

Introduction to Network Troubleshooting, Physical Connection Troubleshooting, LED Status Troubleshooting, Command Line Troubleshooting, Software Tools Troubleshooting, Hardware Tools Troubleshooting,

CAN 2 - SAFETY PRACTICES IN THE WORK ENVIRONMENT

Safety Signs & Color at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Color- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, First aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, First-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting, Manual lifting techniques using kinetic method, Shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure: Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work: Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene: Introduction, how to maintain good hygiene, how to ensure food safety, Grooming, what are the consequences of not maintaining good hygiene?

Public and Home Safety: Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing, Food safety in the home, Food borne diseases.

CAN 3 – WINDOWS 7 INSTALLATION AND CONFIGURATION

BASICS OF OPERATING SYSTEM

Operating System Basics, Basic concepts of operating systems- Desktop, Network, Server; minimum hardware requirements and compatibility with the OS, Characteristics of modern operating systems, Booting of system from DOS/Windows, Fundamentals of Hard Disk Partitioning and Formatting Hard Disk using F-disk/ Disk Manager, Using desktop operating system (DOS/ Windows), Identify applications and environments that are compatible with an operating system, Installation of operating system and Multiple Booting option

INSTALLATION OF WINDOWS 7

Installing, upgrading and migrating to Windows 7: Preparing, Clean and Image-based Installation, Upgrading and Migrating to Windows 7, Configuring Windows 7; Configuring disks and device drives: Partitioning Disks in Windows7, Managing Disk Volumes, Maintaining Disks, Installing and Configuring Device Drivers; Configuring file access and printer on Windows 7 Clients: Overview of Authentication and Authorization, Managing File Access, Managing Shared Folders, Configuring File Compression, Managing Printing, Configuring File Access and Printers on Windows 7 Client computers;

Configuring network connectivity: Configuring IPv4 Network Connectivity, Configuring IPv6 Network Connectivity, Implementing Automatic IP Address Allocation, Overview of name resolutions, Troubleshooting Network Issues, Configuring Network Connectivity; Configuring Wireless network connections: Overview of Wireless Networks, Configuring a Wireless Network;

Securing Windows 7 Desktops: Overview of Security Management in Windows 7, Security Windows 7 Client Computer by Using Local Security policy Settings, Security Data by using Encryptions File System (EFS) and Bitlocker, Configuring Application Restrictions,

Configuring User Account Controls, Configuring UAC, Local Security Policies, EFS, and AppLocker, Configuring Windows Firewall, Configuring Security Setting in Internet Explorer 8, Configuring Windows Defender, Configuring Windows Firewall, Internet Explorer 8 Security and Windows Defender

Optimizing and maintaining Windows 7 Client computers: Maintaining performance by using the windows 7 Performance Tools, Maintaining Reliability by Using the Windows 7 Diagnostic Tools, Backing Up and restoring data by Using Windows backup, Restoring a Windows 7 System by Using System restores Points, Configuring Windows Update, Optimizing and Maintaining Windows 7 Client Computers

Introduction and configuration of Outlook Express

CAN 4 - WINDOWS 2008 SERVER MANAGEMENT

Introduction to Server architecture - Windows NT, Windows Server 2000, 2003, 2008 etc. and their features, Windows server file systems: Physical file organization, Basic File systems: FAT, NTFS, CDFS, HPFS, File systems Integrity and recoverability, File compression.

Introduction to win 2008 server, clean installation and upgrade, configuration of windows server 2008, win server 2008 command line tools.

windows server 2008 management tools – remote administration, remote desktop, server management technologies, server manager and server Manager CMD, delegation policy and procedure, monitoring and maintaining server – patch implementation, WSUS, application patch, performance evaluation and optimization, server deployment, plan and implement group policy,

GPO management – backup and recovery, plan file and print server, shared resources and offline data access, address assignment, name resolution, network access control, certificate services.

Windows 2008 server securities – roll back planning, Bitlocker implementation, monitor and maintain security policy.

Active directory : Implementation and maintenance, windows powershell with active directory, active directory recycle bin, offline domain join, service accounts, IIS implementation, hosting application with IIS, managing IIS, accessing IIS resources on internet, Windows Server 2008 Terminal Services, Configuring RemoteApps on Windows Server 2008, Configuring a Windows Server 2008 Terminal Services License Server,

Managing Windows Server 2008 Disk Quotas, Repairing and Defragmenting Windows Server 2008 Disks, Configuring Windows Server 2008 File Sharing, NET SHARE to Configure Windows Server 2008 File Sharing, Windows Server 2008 File and Folder Ownership and Permissions, Auditing Windows Server 2008 File and Folder Access, Configuring Volume Shadow Copy on Windows Server 2008,

Building a Windows Server 2008 Network Load Balancing Cluster, Configuring and Managing Windows Server 2008 DHCP Servers, Setting Up and Managing a

Windows Server 2008 Print Server, File Server, Database Server, Web Server, Proxy Server; Direct access and network policy – introducing direct access, deploying direct access, VPN access, network policy server,

CAN 5 - LINUX ADMINISTRATION

Introduction to Free and Open Source Software, Definitions and Historical development of Open Source Software, Linux Installation and Configuration- Introduction, The Linux File System, A review of the Linux File System, Partitioning Schemes, Linux Installation; Linux Command line Structure, Linux File Management - Files and Directories, Handling Directories, Using cp and mv; Linux Post Installation Activities, Devices and Linux File System Management, Process Management- Listing terminating and scheduling programmers executions on a Red Hat Enterprises Linux system;

Groups and User Management- Reading and setting permission on files and directories, introduction of advanced file systems permissions like SetUID and SetGID; Text Manipulation- text-processing utilities in Red Hat Enterprise Linux, including grep ,cut, sed, sort, diff and patch; Linux Kernel, Bash Scripting- using shell variables and scripts to customize the command –line environment;

Software Package Installation, Linux Windowing Environment, Linux System Administration, Linux Networking Configuration, Setting up Basic Networking Services: DNS, DHCP and LDAP, Web/Internet Gateway, Email Gateway, Linux Security, troubleshooting mythologies, System Performance and Security, System Service Access Controls, Configure, control and secure access to FTP, NFS and SMB/CIFS (Samba), Configure implements and secure access to the Apache Web Server and Squid Proxy Cache

CAN 6- IT INFRASTRUCTURE MANAGEMENT

Introduction, IT Infrastructure Management, IT Service Management- SLA, TAT etc., Introduction to ITIL, ITIL Process model, Service support process set- Configuration Management, Incident Management, Problem Management, Service Desk, Change Management, Release Management; Services Delivery Process Set - Service Level Management, Capacity Management, IT Service Continuity Management, Availability Management, Security Management, Financial Management. Introduction to various quality management standards- BS1500, ISO 9000 etc

CAN 7 – WORKING WITH MS OFFICE

MS WORD 2007/10

Creating opening and saving documents, Entering and editing text, Setting up the document: margin, page breaks, and more, Formatting: text, paragraphs, and headings, Themes and templates, Spelling, grammar, and reference tools, Printing Word document , Planning with outlines, Working with long documents and master document, Organizing your information with tables, Adding graphics, video and sound to your documents, Mass mailing with mail merge, Creating forms with word, Word's XML connection, Adding & reviewing comments, changes, and protecting documents, Customizing Word with macros and other tools, Changing your security setting, Introducing macros and visual basic, Creating your own themes and templates

MS EXCEL 2007/10

Creating and navigating worksheets, Adding information to worksheets, Moving data around a worksheets, Managing worksheets and workbooks, Formatting Cells, Smart Formatting tricks, Viewing and printing worksheets, Building basic formulas, Math and statistical functions, Financial functions, Manipulating dates, times and text, Lookup, reference and information functions, Advanced Formula writing and troubleshooting, Tables & List management, Grouping and outlining data, Templates, Creating basic charts, Formatting and perfecting charts, Inserting graphics, Scenarios and goal seeking, Pivot tables, Protections your workbooks, Worksheet collaboration, Exchanging data with other programs, Connecting worksheet to the web, Automating tasks with macros

MS POWER POINT 2007/10

Crating a basic presentation, Editing slides, Formatting an aligning your text, Formatting and laying out your slides, Editing your slides show, Adding charts, diagrams, and tables, Delivering presentations, Printing presentations, Putting image and documents on slides, Adding sound and video, Slide transitions and animated effects, Make your slides clickable, Customizing PowerPoint, Macros

CAN 8 – COMMUNICATION AND PERSONALITY DEVELOPMENT

Grammar : Parts of Speech, - Articles and Determines, Noun and Pronoun, Adjective and Adverb, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of

Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,

Written English: Advance Writing Skills (formal, informal paragraph, story, letter, application)

Personality development : Soft Skills Development, Body Language, Behavioral and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1.	CAN 1	Advance Networking	3	90	12	33	18	27
2.	CAN 2	Safety Practices in the Work Environment	1	30	4	11	6	9
3.	CAN 3	Windows 7- Installation and Configuration	2	60	8	22	12	18
4.	CAN 4	Windows 2008 Server Management	3	90	12	33	18	27
5.	CAN 5	Linux administration	3	90	12	33	18	27
6.	CAN 6	IT Infrastructure Management	2	60	8	22	12	18
7.	CAN 7	Working with MS Office	1	30	4	11	6	9
8.	CAN 8	Communication and Personality Development	1	30	4	11	6	9

Study Modules & Books Information

Sr. No	Course Code	Subject Name	Modules to be used
1.	CAN 1	Advance Networking	IT 09 - Networking
2.	CAN 2	Safety Practices in the Work Environment	S 69 - Safety Practices, Primary Health and Personal Hygiene
3.	CAN 3	Windows 7- Installation and Configuration	Comdex Hardware and Networking Course Kit, Dreamtech Press
4.	CAN 4	Windows 2008 Server Management	H 10 : Windows Server Management
5.	CAN 5	Linux administration	S 26 : Linux
6.	CAN 6	IT Infrastructure Management	ITIL foundation Exam Study Guide, Gallacher
7.	CAN 7	Working with MS Office	S19 – MS Word S20 – MS Excel S25- Power Point
8.	CAN 8	Communication and Personality Development	S68 : Effective Communication And Personality Development

CERTIFICATION IN HOUSE WIRING (CHW)

CERTIFICATION IN HOUSE WIRING (CHW)

(A) Duration : 03 Months (D) Courses : 05
 1/2 vof/k : 06 elg 1/2 dld 1 : 08
 (B) Eligibility : 10th Pass (E) Credit : Non-credit
 1/2 ik-rk : 12omikd 1/2 ØfMV : ukW d-fMV
 (C) Contents and Scheme of Examination
 1/2 ikB; Øe fo"k l ph , oaijhkk ; k uk

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
CHW 1	Introduction to House Wiring Safety and Regulations	Non - Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Identify the hazards of faulty house wiring, Implement fire prevention measures through proper wiring practices, Ensure electrical safety for occupants, Comprehend the impact of wiring on power supply and efficiency, Understand the legal and practical implications of wiring compliance.

CHW 2	Tools and Equipment	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> • Recognize potential hazards associated with incorrectly installed or maintained electrical systems • Define the importance of personal safety as the primary goal in electrical safety • Identify measures such as proper wiring, grounding, and insulation to prevent electric shocks • Explore the consequences of electrical malfunctions on property and possessions • Understand the importance of professional electrician services
CHW 3	Electrical Circuits and Components	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> • Demonstrate proficiency in identifying and utilizing power tools for various tasks. • Exhibit competence in selecting and employing measuring instruments accurately. • Apply knowledge and skills in the identification and effective use of various tools and equipment.
CHW 4	Wiring Materials, Planning and Methods	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> • Demonstrate understanding of basic electrical circuits, distinguishing between series and parallel configurations. • Identify and explain the components integral to an electrical circuit.

										<ul style="list-style-type: none"> Comprehend the fundamentals of Cable routing and securing techniques
CHW 5	Wiring Installation Steps	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Analyze and comprehend electrical blueprints and diagrams proficiently. Evaluate load requirements for diverse rooms and appliances. Develop wiring plans with precision, including outlet placements and circuit distribution. Importance of testing and verifying wiring installations Identifying and fixing common wiring issues: open circuits, short circuits, etc.

Note: For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
500	240

Detailed Syllabus

CHW 1: Introduction to House Wiring Safety and Regulations

- Understanding the importance of safe and efficient house wiring
- Overview of electrical systems in residential buildings
- Introduction to basic electrical concepts: voltage, current, resistance, and power
- Importance of electrical safety in house wiring
- Common electrical hazards and how to avoid them
- Overview of local electrical codes and regulations
- Proper use of personal protective equipment (PPE)

CHW 2: Tools and Equipment

- Identification and proper use of essential tools and equipment
- Hand tools: pliers, screwdrivers, wire strippers, etc.
- Power tools: drills, saws, etc.
- Measuring instruments: multimeters, voltage testers, etc.

CHW 3: Electrical Circuits and Components

- Understanding basic electrical circuits: series and parallel
- Components of an electrical circuit: switches, outlets, lights, etc.
- Different types of cables and wires: sizes, colors, and uses
- Basics of grounding and bonding

CHW 4: Wiring Materials, Planning and Methods

- Reading and interpreting electrical blueprints and diagrams
- Determining load requirements for various rooms and appliances
- Creating a wiring plan: outlet placements, circuit distribution, etc.
- Types of wiring methods: conduit, armored cable, non-metallic sheathed cable, etc.
- Proper selection and installation of wiring materials
- Cable routing and securing techniques
- Cable management and organization

CHW 5: Wiring Installation Steps

- Installation of electrical boxes, outlets, and switches
- Wiring outlets and switches: single-pole, three-way, four-way configurations
- Wiring lighting fixtures and ceiling fans
- Proper installation of ground-fault circuit interrupters (GFCIs) and arc-fault circuit interrupters (AFCIs)
- Proper techniques for splicing and connecting wires

- Wire stripping, twisting, and using wire connectors
- Creating secure and reliable connections
- Importance of testing and verifying wiring installations
- Using multimeters and voltage testers to check for continuity and voltage
- Identifying and fixing common wiring issues: open circuits, short circuits, etc.
- Conducting a final inspection of the wiring installation
- Addressing any deficiencies and making necessary adjustments
- Documenting the wiring layout and connections for future reference

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self-study	Practical	Assignments
1	CHW 1	Introduction to House Wiring Safety and Regulations	Non-Credit	30	4	26	18	-
2	CHW 2	Tools and Equipment	Non-Credit	60	8	34	18	-
3	CHW 3	Electrical Circuits and Components	Non-Credit	60	8	34	18	-
3	CHW 4	Wiring Materials, Planning and Methods	Non-Credit	60	8	34	18	-
4	CHW 5	Wiring Installation Steps	Non-Credit	60	8	34	18	-

Study Modules & Books Information

Sr. No	Course Code	Subject Name	Modules to be used
1	CHW 1	Introduction to House Wiring Safety and Regulations	Electrical Safety Handbook, 5th Edition
2	CHW 2	Tools and Equipment	S69 : Safety Practices, Primary Health and Personal Hygiene, AISECT
3	CHW 3	Electrical Circuits and Components	Electrical Components - Higher education Pearson
4	CHW 4	Wiring Materials, Planning and Methods	Electrical Wiring Components and Accessories
5	CHW 5	Wiring Installation Steps	Code of Practice for Electrical Wiring Installations

**CERTIFICATE IN NETWORKING
TECHNOLOGY (CNT)**

Certificate in Networking Technology (CNT)

usVofdk VdukykWh eal fvZQdV (CNT)

(A) Duration : 03 Months

1/2 vof/k : 03 ek

(B) Eligibility : 12th Pass

1/2 ik-rk : 12ohik

(C) Contents and Scheme of Examination

1/2 ikB; Øe fo"k l ph, oaijhkk; k uk

(D) Courses : 05

1/2 dk 1 : 05

(E) Credit : Non-Credit

1/2 ØfM : uk ØfM

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignment s		Key Learning Outcomes
				Ma x	Min	Ma x	Min	Ma x	Min	
CNT1	Networking Fundamentals नेटवर्किंग फंडामेंटल्स	Non - Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Narrate network concepts and terminology Identify, install and configure network components Identify and learn about hardware components for a peer-to-peer network Understand installation of network printers.
CNT2	Safety Practices in the Work Environment कार्यस्थल पर सुरक्षा प्रबंध	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Familiarity with safety, fire safety, first aid, food safety, primary health and basic hygiene
CNT3	Windows NT, Windows 2000 and 2003 Server Management विंडोज एनटी , विंडोज 2000 एवं 2003 सर्वर मैनेजमेंट	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Understand know-how to install and configure a Windows system as a server especially as a File Server, Web Server using Windows NT/2000/2003 server. Setup LAN using Windows NT/2000/2003 server Understand basic server maintenance task.

CNT4	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	Non Credit	100	100	40	-	-	-	-	<ul style="list-style-type: none"> Basic communication skills Personality grooming
CNT5	Linux & Installation लाइनेक्स एण्ड इंस्टालेशन	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Understand know-how to install and configure a Linux system as a server especially as a Web Server, mail server, DNS, Proxy and Samba server. Setup LAN using Linux server Operating System. Understand basic server maintenance task.

Note : For A PASS - A Student Would Require To Secure 40% For Both Theory And Practical.

Grand Total	Pass
500	200

Detailed Syllabus

CNT 1 – NETWORKING FUNDAMENTALS

- Basics of Data communication and Networking
- Needs for Networking
- Advantage and Disadvantage of Networking
- Type of Network-LAN, WAN, MAN
- Network Topology- Bus, Ring, Star, Hierarchical
- Characteristics of Network- Architectural Model, Topology
- Hardware Components of a Network: -Computer, ports, connectors, cables, internetworking devices.
- Software Components of a Network:-operating system, drivers, protocol, services, addresses.
- Internetworking Devices Hubs, Bridges, switches, Routers, Wireless access point.
- Network Cables-Twisted pair, coaxial cable, fiber optic cable.
- Network Model- Peer to Peer, Protocol, Client/Server Network, Hybrid Type.
- Types of Server-File Server, Database Server, Print Server, Web Server, Proxy Server
- Network Protocols-Communication Protocol, Hardware Dependent Protocol, Software Dependent Protocol.
- Protocol Services-File & Printer, Multimedia, Email, WWW, Usenet Newsgroups, e-phonebooks, Video Conferencing, Administrative Record Keeping.
- Network Operating System-Windows XP, Windows NT, 2000, 2003, 2008 Server Unix, Linux.
- Addresses :- IP Address, MAC Address, Port Address, IP Address classification, Difference between IPv4 & IPv6, Difference between Physical Address and Logical Address, Difference between Static and Dynamic configuration, Different Classes of IP Address, Difference between Public and Private IP Address.
- OSI Model and TCP/IP Model.
- Internet Basics and concept of Domain

CNT 2 – SAFETY PRACTICES IN THE WORK ENVIRONMENT

Safety Signs & Colour at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Colour- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, first aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, first-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting, Manual lifting techniques using kinetic method, shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure : Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work : Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene : Introduction, How to maintain good hygiene, How to ensure food safety, Grooming, What are the consequences of not maintaining good hygiene?

Public and Home Safety : Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing, Food safety in the home, Food borne diseases.

CNT 3 - WINDOWS NT SERVER MANAGEMENT & WINDOWS 2000 & 2003 SERVER MANAGEMENT

Windows NT Server Management

- Introduction to Windows NT, Various Features, Differences with other Windows Environment and other O. S. s. , Windows NT workstations Versus Server. Kernel and its Subsystems: Kernel/User Mode, Win32 Subsystem.
- Security Models: System level restrictions, Server application security, Domain group access, Right and privilege verification, Application Support- Windows and Non Windows applications.
- Installation: Requirement Analysis, Basic Hardware required, Workgroup and Domain concepts: PDC, BDC.
- Network Configuration: Selecting NIC, Installing NIC driver, Choosing protocols and services
- NT Administration: User manager for domain, Disk administration, Backup, System policy editor, Remote access administration, Network clients administration.
- Control panel- Start and stops services from control Panel, Adding/Removing Hardware and Software with control panel.
- Windows NT File systems: Physical file organization, Basic File systems: FAT, NTFS, CDFS, HPFS, The FAT file systems, The NTFS file systems, File systems Integrity and recoverability, File compression.
- Networking with TCP/IP: TCP/IP services in NT, Advantages of using TCP/IP in NT, TCP/IP installation and configuring DHCP and WINE services.
- Remote Access Service: Remote access clients and servers, Installing and configuring Remote Access Server, Administration of RAS.
- Setting and running up a web server – Windows NT web server - Internet Information Server, IIS setup, setting up a web site, Virtual directories, Virtual Web Sites. Administration of Web Server with ISM.
- Windows NT Registry – Registry working, Necessity of registry, Registry Database layout, Registry Editor and its working.

- Diagnosis and troubleshooting NT hardware and software installation problems, Startup problems, problems with Logon, Accounts & password, Network HW and SW problems, Performance problems. NT diagnostic tools: WINMSD, Network Monitor.
- HAL, Kernel and Executive: Hardware Abstraction Layer (HAL), Kernel – Kernel objects and Threads, NT Executives – I/O Manager and Device Drivers, Process Manager, Virtual Memory Manager, Object manager, LPC facility, Security Reference Monitor.
- Protected Subsystems: NT Subsystem's working, Win32 Subsystem difference between Win16 & Win32, Testing and Queuing Model, Win32 Programming Support, Windows on Windows- Starting win16 programs, multitasking with WOW VDM, Thunking 16-bit to 32-bit runtimes, Intercrosses Communication (IPC), MSDOS Emulation Layers.
- Device Drivers: Windows device scheme, NT Drivers Models- Service Control Monitor, Kernel Mode, User modes, Virtual device mode, Driver requirements and operations.

Windows 2000 & 2003 Server Management

- Introduction to Windows Server 2003(R1, R2 variations -32 bit and 64 bit)
- Deployment of Windows Server 2003
- User Group Management
- Storage Management
- TCP/IP and Ipv4 Network Management
- Understanding NetBIOS, Wins and NetBT
- Configuring DNS and DHCP Server
- Security Management
- Implementing Volume Shadow Copy
- Controlling with MMC
- Controlling with CLI
- Controlling Windows with Registry
- Controlling Windows Group Policy
- Windows Server Virtualization
- Active Directory Domains Services
- Active Directory Certificate Services
- Terminal Services Enhancements Clustering Enhancements
- Implementing and Troubleshooting Nap
- IIS installation and configuration.
- Implementing Active Directory Services.
- Planning and Implementing
- Restoring Active Directory.
- Introduction to windows server 2003
- Introduction, Managing and Maintaining Windows Server 2003 Environment
- New in Windows Server 2003
- Compare with Windows Server 2000
- Virtualization concepts

CNT 4 – COMMUNICATION AND PERSONALITY DEVELOPMENT

Grammar:

Parts of Speech, - Articles and Determines, Noun and Pronoun, Adjective and Adverb, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,

Written English:

Advance Writing Skills (formal, informal paragraph, story, letter, application,

Personality development: Soft Skills Development, Body Language, Behavioral and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management

CNT 5 - LINUX AND INSTALLATION

- Overview of Linux
- Installation of Linux
- Linux Advanced File System Management
- Besh Shell
- Linux Commands.
- Running DOS Command in Linux.
- Configuration of partition in Linux.
- Text Editor-vi
- Bash Shell Scripting
- Basic Networking in Linux.
- Configuration and Installation of Hardware Device
- Linux File Security
- Connect to Internet in Linux.
- Installation software in Linux.
- Kernel Services and Configuration
- System Monitoring
- Reading Linux Partition in Windows & reading windows partition in Linux.

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CNT 1	Networking and Fundamentals	Non-Credit	60	8	34	18	-
2	CNT 2	Safety Practices in the Work Environment	Non-Credit	30	4	17	9	-
3	CNT 3	Windows NT Server Management and Windows 2000 & 2003 Server Management	Non-Credit	60	8	34	18	-
4	CNT 4	Communication and Personality Development	Non-Credit	30	4	26	-	-
5	CNT 5	Linux and Installation	Non-Credit	60	8	34	18	-

Study Modules & Books Information

S. No	Course Code	Subject Name	Modules to be used
1	CNT 1	Networking & Fundamentals	IT09 – Computer Networks
2	CNT 2	Safety Practices in the Work Environment	S69 : Safety Practices, Primary Health and Personal Hygiene
3	CNT 3	Windows NT Server Management & Windows 2000 & 2003 Server Management	H10 - Windows Server Management
4	CNT 4	Communication and Personality Development	S68 : Effective Communication And Personality Development
5	CNT 5	Linux & Installation	S26 - Linux

**CERTIFICATE FOR DTH
INSTALLER & SERVICE
TECHNICIAN (CDIST)**

Certificate for DTH Installer & Service Technician (CDIST)

सर्टिफिकेट फॉर डीटीएच इंस्टालर & सर्विस टेक्नीशियन (CDIST)

(A) Duration : 3 Months

1/2 वॉल्यूम : 3 महीने

(B) Eligibility : 10th Pass

1/2 कक्षा : 10वीं कक्षा

(C) Contents and Scheme of Examination

1/2 कक्षा : 10वीं कक्षा, 11वीं कक्षा, 12वीं कक्षा

(D) Courses : 04

1/2 कक्षा : 04

(E) Credit : Non-Credit

1/2 कक्षा : नॉन क्रेडिट

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
CDIST 1	Introduction to DTH Technology डीटीएच टेक्नोलॉजी से परिचय	Non - Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> • Introduction to communication of Signals and VHF transmission. • Understanding of TV transmission and TV standards. • Basic concepts of Satellite communication. • Concepts of DTH Technology.
CDIST 2	Install and Repair DTH Set-top Box डीटीएच सेट टॉप बॉक्स की स्थापना एवं मरम्मत	Non - Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> • Basic Knowledge of DTH Set Top Box Architecture, block diagram and Hardware. • Basic Knowledge of Dish installation, check signal strength. • Process to activation process of DTH connection. • Identification of faults, Servicing and resolution. • Understand the work order and site details of the customer.

										<ul style="list-style-type: none"> • Coordinate with stores department. • Installation of DTH Set Top Box. • Rectify the problem and resume uninterrupted service.
CDIST 3	Safety Practice at Workplace कार्यस्थल पर सुरक्षा प्रबन्ध	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> • Familiarity with safety practice at workplace. • Knowledge about various hazards and their remedies. • Ensure clean, dust free and organized working environment. • Knowledge of Primary first aid for any accidental situation. • Understand about personal health and hygiene.
CDIST 4	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	Non Credit	100	100	40	-	-	-	-	<ul style="list-style-type: none"> • Basic communication skills. • Personality grooming. • Responding to customer queries effectively. • Understand customer's requirements.

Note: For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
400	160

DETAILED SYLLABUS

CDIST 1 – INTRODUCTION TO DTH TECHNOLOGY

Basics of Electricity - Early sources of electrical current, Long-distance communications, Frequency, Phase, electrical signals, modulation, binary digital signals, transporting electrical signals

Television Transmission - video transmission, Picture Element, Aspect Ratio., TV transmission by satellite, digital television, Coding Schemes, MPEG-2 Compression Technique,

Community Antenna Television (CATV) - Introduction, 15.4 hybrid fiber-coax (HFC) systems, Phase, Wavelength, Frequency, Sinusoidal Signal, Spectrum, Wi-Fi frequencies and wavelengths, Communication System, Attenuation, MODEM, Multiplexing, CDMA, Types of transmissions, Traveling radio waves,

Satellite Communication - Introduction, applications of satellites, frequency allocation, bandwidth, power, shared and dedicated capacity, ground installation, types of satellites, benefits of satellite, satellite system architecture, network topologies,

CDIST 2 – INSTALL AND REPAIR DTH SET-TOP-BOX

Direct to Home Technology - DTH in India, advantages and disadvantages of DTH service, working of DTH system, components, programming, broadcast center, encryption & transmission, dish, receiver,

Set Top Box – Hardware and Software Components, functionality, flow of data, IP & vendors, issues

Set up DTH System - Low noise block-down converters, different types of satellite dishes, unpacking procedure, site selection:, assembly procedure, dish installation process, 'tuning' of satellite dish, Low-Noise Block Down converter Installation and Operation,

Tools and their Operation - Multimeter, Satellite Meter, RF Strength Meter, Drilling Machine, Tester,

CDIST 3 - SAFETY PRACTICES AT WORK PLACE

Safety Signs & Color at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Color- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, first aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, First-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting, Manual lifting techniques using kinetic method, shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure: Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work: Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene: Introduction, how to maintain good hygiene, how to ensure food safety, Grooming, what are the consequences of not maintaining good hygiene?

Public and Home Safety: Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing, Food safety in the home, Food borne diseases.

CDIST 4 – COMMUNICATION AND PERSONALITY DEVELOPMENT

Grammar : Parts of Speech, - Articles and Determines, Noun and Pronoun, Adjective and Adverb, Verb, Conjunctions and Prepositions, Tenses, Punctuations, Active & Passive Voice, Type of Sentences (simple, complex, compound), Reported Speech (direct and indirect), Types of Sentences, Prepositions, -Gerunds, -Infinitives,

Written English: Advance Writing Skills (formal, informal paragraph, story, letter, application)

Personality development : Soft Skills Development, Body Language, Behavioral and Symptomatic Soft Skills, Etiquette and Manners, Positive Thinking, Motivation, Goal setting, Team building, Self Confidence, Leadership Skills, Time Management

Counseling and Study Structure

S. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CDIST 1	Introduction to DTH Technology	Non-Credit	30	4	17	9	-
2	CDIST 2	Install and repair DTH set-top box	Non-Credit	30	4	17	9	-
3	CDIST 3	Safety Practices at Work Place	Non-Credit	30	4	17	9	-
4	CDIST 4	Communication and Personality Development	Non-Credit	30	4	26	-	-

Study Modules & Books Information

S. No.	Course Code	Subject Name	Modules to be used
1	CDIST 1	Introduction to DTH Technology	H 20 - Guide for DTH Set-top-box Technician
2	CDIST 2	Install and repair DTH set-top box	H 20 - Guide for DTH Set-top-box Technician
3	CDIST 3	Safety Practices at Work Place	S69- Safety Practices, Primary Health and Personal Hygiene
4	CDIST 4	Communication and Personality Development	S68 - Effective Communication and Personality Development

**CERTIFICATE IN LAPTOP
REPAIRING (CLR)**

Certificate in Laptop Repairing (CLR)

लैपटॉप रिपेयरिंग में सर्टिफिकेट (CLR)

(A) Duration : 3 Months
 1/2 वॉल्यूम : 3 सेमी

(B) Eligibility : 12th Pass
 1/2 इंकर्स : 120ml

(C) Contents and Scheme of Examination

1 1/2 इंकर्स; 0.5 फीट, 1 प्ल, 0.5 इंकर्स; 1 इंकर्स

(D) Courses : 05
 1/2 इंकर्स : 05

(E) Credit : Non-Credit
 1/2 इंकर्स : 0.5 इंकर्स

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
CLR1	Fundamentals of Laptop लैपटॉप का फंडामेंटल	Non - Credit	100	100	40	-	-	-	-	<ul style="list-style-type: none"> Understand functions, characteristics & basic components of a Laptop. Know-how of physical structure and working of various peripherals, storage devices. Understand operating system & file system basics
CLR2	Safety Practices in the Work Environment कार्यस्थल पर सुरक्षा प्रबंध	Non - Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Familiarity with safety, fire safety, first aid, food safety, primary health and basic hygiene
CLR3	Laptop Assembling & Installation लैपटॉप असेम्बलिंग इन्स्टालेशन	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Understand basic parts/modules of laptop Understand assemble / de-assemble procedure of laptop

										• Basic fault diagnosis
CLR4	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	Non - Credit	100	100	40	-	-	-	-	<ul style="list-style-type: none"> • Basic communication skills • Personality grooming
CLR5	Laptop Repairing लैपटॉप रिपेयरिंग	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> • Proficiency in using & testing of electronic components. • Understand Power on Self-Test (POST) of the laptop and its analysis. • Learn laptop working principle and block diagram to diagnose the problem and solution finding. • Understand voltages and its requirement for laptop. • BIOS upgradation.

Note : For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
500	200

Detailed Syllabus

CLR 1 - FUNDAMENTALS OF LAPTOP

- Introduction to Laptop.
- Block Diagram of Laptop & its Description
- Difference between Desktop & Laptop, Comparison of Various Laptops.
- Description of laptop Devices – Processor, Motherboards, memory, Power Supply, Expansion cards, Hard Disk, Removable Storage, Graphic, Sound Keyboard, Pointing Devices, Modems, NIC and Wireless NIC, Bluetooth Devices and all other parts in a Laptop

CLR 2 – SAFETY PRACTICES IN THE WORK ENVIRONMENT

Safety Signs & Colour at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Colour- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, first aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, first-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting, Manual lifting techniques using kinetic method, shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure: Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work: Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene: Introduction, how to maintain good hygiene, how to ensure food safety, Grooming, what are the consequences of not maintaining good hygiene?

Public and Home Safety: Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing, Food safety in the home, Food borne diseases.

CLR 3 – LAPTOP ASSEMBLING & INSTALLATION

- Using & Understanding service manuals of Laptop
- Disassembly Flowchart
- Removing and Replacing components within Laptop- Battery, Memory Module, Hard Disk, Optical Drive(CD/DVD), Wireless LAN Mini PCI Card, Keyboard, Speaker Assembly,

Switchboard PCA, Display Assembly, Top Case, Floppy Drive, Infrared (I/R) PCA, Audio PCA, Heat Sink (with Fan), CPU Module., RJ11/1394 Connector Module, Motherboard, Bottom Case, BIOS IC, Other Components

- INSTALLATION:
- Booting of system from DOS/Windows
- Fundamentals of Hard Disk Partitioning and Formatting Hard Disk using Fdisk/Disk Manager
- Basic concepts of operating systems- Desktop, Network, Server.
- Determine minimum hardware requirements and compatibility with the OS
- Characteristics of modern operating systems.
- Using desktop operating system (DOS/Windows).
- Identify applications and environments that are compatible with an operating system
- Installation of operating system, Installation of Multiple Booting (Win-98, Win-XP, VISTA, Windows 7)
- Installation of Different Drivers (Sound, display, USB Devices, Printer, Scanner, Web Camera, TV Tuner Card, Wireless LAN Mini PCI Card, Bluetooth, Modem Setting)
- Importance of rebooting
- Installation of Application Software, (Office XP, Visual Studio, Java, Auto Cad etc)
- Installation of DTP Software's (Photoshop, Corel, PageMaker, etc)
- Installation of Media Players (Adobe Flash Player, Real Player, Jet Audio, Power DVD)
- Installation of Nero and Other Optical Disk Writer.
- Installation of Anti-Virus, Scan Virus File & Folder, Repair Virus File & Folder.
- Create a Rescue Disk,
- Installation of Acrobat Reader, WinZip etc.

CLR 4 – COMMUNICATION AND PERSONALITY DEVELOPMENT

- **Basic Grammar for Effective Communication : Parts of Speech** – Revision (sentence, phrase, clause, parts of speech), Noun, Pronoun, Adjective, Article, Verb, Active & Passive Voice, Infinitive, Gerund, Preposition, Conjunctions, Interjection; **Analysis, Transformation, Synthesis and Direct & Indirect Speech** – The phrase, the clause, the sentence, Analysis of compound and complex sentences, Transformation of sentences, Synthesis of sentences, Direct and indirect speech; Composition and Comprehension – Picture composition, How to write short a short story, Letter writing; **Situational communication**
- **Personality Development** : Communication skills, Body language, Positive attitude, Etiquette and manners, SWOT analysis, Decision making, Goal setting, Positive thinking, Self confidence, Motivation, Time management, Anger management, Stress management, Leadership, Team building, Essential life skills

CLR 5 – LAPTOP REPAIRING

- Identify and apply common preventive maintenance techniques for operating systems
- Create a preventive maintenance plan
- Use of Control Panel.

- Use of System Tools
- Schedule a task- Taking Backup of data and Restore the backup in the hard drive
- Troubleshooting Flowcharts
- Power control Section failure, Testing & fault Finding.
- Video Section failure, Testing & fault Finding.
- Motherboard, RAM, CPU Failure, Testing & Fault Finding.
- Audio Section Failure, Testing & Fault Finding
- Removable Media Failure, Testing & Fault Finding
- Network Devices Failure, Testing & Fault Finding
- Micro Controller Section Failure, Testing & Fault Finding
- Voltage Regulator Module Failure, Testing & Fault finding.
- PCI Controller, Modem, PCMCIA etc. Failure, Testing & Fault finding
- General Fault Finding & testing of Laptop

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CLR 1	Fundamentals of Laptop	Non-Credit	60	8	52	-	-
2	CLR 2	Safety Practices in the Work Environment	Non-Credit	30	4	17	9	-
3	CLR 3	Laptop Assembling & Installation	Non-Credit	60	8	34	18	-
4	CLR 4	Communication and Personality Development	Non-Credit	30	4	26	-	-
5	CLR 5	Laptop Repairing	Non-Credit	60	8	34	18	-

Study Modules & Books Information

Sr. No	Course Code	Subject Name	Modules to be used
1	CLR 1	Fundamentals of Laptop	1). H12 : Assembling/Disassembly and Installation of Laptop, AISECT (English) 2). Laptop Repairing Course by Vishnu P. Singh (Hindi)
2	CLR 2	Safety Practices in the Work Environment	S69 : Safety Practices, Primary Health and Personal Hygiene, AISECT
3	CLR 3	Laptop Assembling & Installation	1). H12 : Assembling/Disassembly and Installation of Laptop, AISECT (English) 2). Laptop Repairing Course by Vishnu P. Singh (Hindi)
4	CLR 4	Communication and Personality Development	S68 : Effective Communication and Personality Development, AISECT
5	CLR 5	Laptop Repairing	1). H12 : Assembling/Disassembly and Installation of Laptop, AISECT (English) 2). Laptop Repairing Course by Vishnu P. Singh (Hindi)

**CERTIFICATE IN ASSEMBLY OF PC
(CAP)**

Certificate in Assembly of PC (CAP)

डिप्लोमा इन कंप्यूटर एसेम्बली (CAP)

(A) Duration : 3 Months
 1/2 वर्यक : 3 एग

(D) Courses : 05
 1/2 कक 1 : 05

(B) Eligibility : 10th Pass
 1/2 िकक : 10थ िक

(E) Credit : Non-Credit
 1/2 0\$M : uW 0\$M

(C) Contents and Scheme of Examination

1/2 िक; 0े फ"क ल ष, oaijhkk; k uk

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
CAP1	Fundamental of Computers and Information Technology सूचना तकनीक एवं कम्प्यूटर से परिचय	Non - Credit	100	100	40	-	-	-	-	<ul style="list-style-type: none"> Understand the functions, characteristics and basic components of a computer system and Operating System. Know-how of various peripherals, storage devices and understand their physical structure & working.
CAP 2	Safety Practices in the Work Environment कार्यस्थल पर सुरक्षा प्रबंध	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Familiarity with safety, fire safety, first aid, food safety, primary health and basic hygiene
CAP 3	Assembly of PC पी.सी. की असेम्बली	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Understand basic parts/modules of computer. Demonstrate assemble / de-assemble procedure of computer. Basic fault diagnosis.

CAP4	Communication and Personality Development कम्यूनिकेशन एवं पर्सनालिटी डेवलपमेंट	Non Credit	100	100	40	-	-	-	-	<ul style="list-style-type: none"> • Basic communication skills • Personality grooming
CAP5	PC Installation and Maintenance पी.सी. इन्स्टालेशन एण्ड मेंटेनेंस	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> • Understand installation process of operating system. • Understand hard disk partitioning fundamentals. • Understand and demonstrate software installation and removal.

Note : For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
500	200

Detailed Syllabus

CAP 1 - FUNDAMENTAL OF COMPUTERS AND INFORMATION TECHNOLOGY

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers Generations of computers, Personal Computer (PCs) – evolution of PCs, configurations of PCs- Pentium and Newer, PCs specifications and main characteristics. Basic components of a computer system - Control unit, detailed functions of ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

Input/Output & Storage Units:-Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers& types – Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, SIMM, Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive, flash drives Video Disk, Blue Ray Disc, SD/MMC Memory cards, Physical structure of floppy & hard disk, drive naming conventions in PC. DVD, DVD-RW.

Software and its Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Introduction to operating system for PCs-DOS Windows, Linux, File Allocation Table (FAT & FAT 32), NTFS files & directory structure and its naming rules, booting process details of DOS and Windows, DOS system files Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software and its types - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention, viruses on network.

Use of communication and IT, Communication Process, Communication types- Simplex, Half Duplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band, Types of Network - LAN, WAN, MAN, Internet, VPN etc. , Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways.

CAP 2 – SAFETY PRACTICES IN THE WORK ENVIRONMENT

Safety Signs & Colour at Work: Safety Signs - Cause for accidents, Safe attitudes; Safety Signs & Colour- Sign categories, Sign types.

First Aid & Artificial Respiration: First Aid - Introduction, First aid and Its aim, Recovery position, Cardiopulmonary resuscitation (CPR), Wound, Shock, Convulsion, Extensive burns, Minor burns and scalds, Chemical burns, Electric shock, Fracture, First-aid box; Artificial Respiration - Respiration, Artificial respiration, Mouth to nose method of artificial respiration, Artificial respiration in case of cardiac arrest, Important points to note after giving artificial respiration to victims.

Safe Lifting and Carrying Techniques: Causes of injury, Types of injury and methods to prevent them, Points that make an objects/load difficult to carry, Preparation before lifting or shifting heavy loads, Correct body posture before beginning the lift in kinetic method of lifting , Manual lifting techniques using kinetic method, Shifting of working tables, Shifting of electronic equipments/instruments, Basic steps of safe lifting and handling.

Fire and Fire Extinguishers: Fire, Fuel, Heat, Oxygen, Controlled and uncontrolled fire, Controlling and extinguishing fire, Fire extinguishers, Types of fire extinguisher - water-filled extinguishers, foam, extinguishers, dry powder extinguishers, carbon dioxide type extinguishers, halon extinguishers, General procedure to be adopted in the event of a fire.

Safe Working Measure : Electric shock, action and treatments; Hazard identification, risk assessment and risk control; Workstation layout and ergonomic guidelines.

Managing Health and Safety at Work : Introduction, General office safety, Types of office accidents, Office hazard control, Office environment, Hazards from electrical equipments, Office safety procedures, Emergency action plan.

Personal Hygiene : Introduction, How to maintain good hygiene, How to ensure food safety, Grooming, What are the consequences of not maintaining good hygiene?

Public and Home Safety : Introduction, Safety at home, Activities that have a potential for accidents, Things that are normally used at home and have a potential for accidents, Public safety, Prevention.

Common Food Borne Diseases and Infections: Introduction, The Farm – beginning of the food chain, Food processing-preventing food-borne illness and improving quality, Transport and storage–safeguarding food, Food safety and retailing , Food safety in the home, Food borne diseases.

CAP 3 - ASSEMBLY OF PC

- Introduction of Assembling & Disassembling.
- Difference between branded and assembled computer.
- Components required for Assembling & Disassembling a PC.
- Detail of components required for Assembling & Disassembling a PC.
- Tools used for assembling. & disassembling.
- Steps for Assembling a PC.
- Install the power supply and check it. .
- Install the components on motherboard - CPU, Heat sink / fan assembly, RAM.
- Install the motherboard.
- Install internal drive-Hard Disk.
- Install drives in external ways- Optical Drive and Floppy Drive.
- Install adapter Cards- NIC, Video adapter & Sound.
- Connect all internal cables - Power cables and Data cables.
- Connect all front panel indicators, switches and cables.
- Close the cabinet.
- Connect all peripherals – Keyboard, Mouse, Monitor, Speaker, Printer, etc.
- Steps for Disassembling a PC.
- Precautions used while Assembling & Disassembling a PC.
- Final check before Booting.
- Testing –Boot Computer for the first time, identify beep codes and BIOS setup.
- Troubleshooting.

CAP 4 – COMMUNICATION AND PERSONALITY DEVELOPMENT

- **Basic Grammar for Effective Communication : Parts of Speech** – Revision (sentence, phrase, clause, parts of speech), Noun, Pronoun, Adjective, Article, Verb, Active & Passive Voice, Infinitive, Gerund, Preposition, Conjunctions, Interjection; **Analysis, Transformation, Synthesis and Direct & Indirect Speech** – The phrase, the clause, the sentence, Analysis of compound and complex sentences, Transformation of sentences, Synthesis of sentences, Direct and indirect speech; Composition and Comprehension – Picture composition, How to write short a short story, Letter writing; **Situational communication**
- **Personality Development** : Communication skills, Body language, Positive attitude, Etiquette and manners, SWOT analysis, Decision making, Goal setting, Positive thinking, Self confidence, Motivation, Time management, Anger management, Stress management, Leadership, Team building, Essential life skills

CAP 5 - PC INSTALLATION AND MAINTENANCE

INSTALLATION:

- Operating System Basics.
- Basic concepts of operating systems- Desktop, Network, Server.
- Determine minimum hardware requirements and compatibility with the OS
- Characteristics of modern operating systems.
- Booting of system from DOS/Windows
- Fundamentals of Hard Disk Partitioning and Formatting Hard Disk using F-disk/ Disk Manager
- Using desktop operating system (DOS/ Windows).
- Identify applications and environments that are compatible with an operating system
- Installation of operating system, Installation of Multiple Booting (Win-98, Win-XP, VISTA Media Center, Win-7 O.S)
- Installation of Different Drivers (Sound, display, USB Devices, Printer, Scanner, Web Camera, TV Tuner Card, Modem, Modem Setting)
- Importance of rebooting
- Installation of Application Software, (MS OFFICE 2003/MS OFFICE 2007, Visual Studio, Java, Auto Cad etc)
- Installation of DTP Software (Photoshop, Corel, PageMaker, etc.)
- Installation of Media Players (Adobe Flash Player, Real Player, Jet Audio, Power DVD)
- Installation of Nero and Other Optical Disk Writer.
- Installation of Anti-Virus, Scan Virus File & Folder, Repair Virus File & Folder.
- Create a Rescue Disk,
- Installation of Acrobat Reader, WinZip, Win-RAR etc.

MAINTENANCE:

- Identify and apply common preventive maintenance techniques for operating systems
- Create a preventive maintenance plan
- Schedule a task- Taking Backup of data and Restore the backup in the hard drive
- Updation of antivirus patches

- Troubleshoot operating systems- Review the troubleshooting process, Identify common problems and solutions
- Use of Control Panel.
 - Desktop Customization.
 - Managing User Accounts and Application.
 - Disk Management.
 - Disk Cleanup and Disk Defragmentation Utility.
 - Device Manager.
 - Bit Locker.
 - Windows Firewall Setting.
 - Recovery and Backup.
 - Policies and Services.
 - Network Setting.
 - File and Folder Sharing.
 - Resources Sharing.
 - Services Sharing.
 - Remote Desktop.
 - Remote Assistance.
 - Use of System Tools

Counseling and Study Structure

S. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self study	Practical	Assignments
1	CAP 1	Fundamental of Computers and Information Technology	Non-Credit	60	8	52	-	-
2	CAP 2	Safety Practices in the Work Environment	Non-Credit	30	4	17	9	-
3	CAP 3	Assembly of PC	Non-Credit	60	8	34	18	-
4	CAP 4	Communication and Personality Development	Non-Credit	30	4	26	-	-
5	CAP 5	PC Installation and Maintenance	Non-Credit	60	8	34	18	-

Study Modules & Books Information

S. No	Course Code	Subject Name	Modules to be used
1	CAP 1	Fundamentals of Computers and Information Technology	S01 - Fundamentals of Computers and Information Technology
2	CAP 2	Safety Practices in the Work Environment	S69 : Safety Practices, Primary Health and Personal Hygiene, AISECT
3	CAP 3	Assembly of P.C.	V 28 : Assembly of PC, Installation and Maintenance, AISECT
4	CAP 4	Communication and Personality Development	S68 : Effective Communication and Personality Development, AISECT
5	CAP 5	P.C. Installation & Maintenance	V 28 : Assembly of PC, Installation and Maintenance, AISECT

**CERTIFICATION IN FIELD
TECHINICIAN - OTHER HOME
APPLIANCE (CFTOHA)**

CERTIFICATION IN FIELD TECHNICIAN - OTHER HOME APPLIANCE (CFTOHA)

(A) Duration : 06 Months (D) Courses : 05

¼½ vof/k : 06 elg ¼½ dk 1 : 05

(B) Eligibility : 10th Pass (E) Credit : Non -Credit

¼½ i k=rk : 10ohi kl ¼½ ØfM : ukW ØfM

(C) Contents and Scheme of Examination

¼½ i k; Øe fo" k l ph , oai jh k ; k uk

Course Code	Title of the Course	Credit	Total Marks	Theory		Practical Marks		Assignments		Key Learning Outcomes
				Max	Min	Max	Min	Max	Min	
CFTOHA 1	Fundamentals of Electricity and Components	Non - Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Understanding of electrical principles and concepts. Acquire essential knowledge about basic electronics components and circuits. Develop foundational skills in electrical and electronics applications for practical use.
CFTOHA 2	Tools and Equipment	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Identify and demonstrate proficiency in using a variety of tools and equipment relevant to the specified field. Apply proper safety protocols and procedures when handling tools and equipment.

										<ul style="list-style-type: none"> Analyze and select the most appropriate tools and equipment for specific tasks based on their functions and characteristics.
CFTOHA 3	Workplace Health and Safety Measures	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Demonstrate comprehensive understanding of workplace health and safety regulations and guidelines. Apply practical knowledge to identify and mitigate potential hazards in the work environment. Implement effective workplace health and safety measures to promote a secure and compliant work environment.
CFTOHA 4	Installation of Water Purifier and Maintenance	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Demonstrate proficiency in the proper installation of water purifiers. Develop skills in routine maintenance tasks for ensuring the optimal functioning of water purifier systems. Acquire knowledge of troubleshooting techniques to address common issues related to water purifiers.
CFTOHA 5	Mixer, Geyser and Microwave Repair and Maintenance	Non Credit	100	70	28	30	12	-	-	<ul style="list-style-type: none"> Demonstrate proficiency in troubleshooting and repairing mixers, geysers, and microwaves. Apply preventive maintenance techniques to enhance the longevity

										<p>and efficiency of mixers, geysers, and microwaves.</p> <ul style="list-style-type: none"> Acquire comprehensive knowledge of safety protocols and guidelines for the repair and maintenance of mixers, geysers, and microwaves.
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Note: For a PASS - A Student would require to secure 40% for both Theory and Practical.

Grand Total	Pass
500	240

Detailed Syllabus

CFTOHA 1: Fundamentals of Electricity and Components

Size and scope of electronic industry and its sub-sectors, Role and responsibilities of Field Technician Other Home Appliances. Employment opportunities for a Field Technician Other Home Appliances. Electricity, Types of electricity – AC, DC, Potential and Potential difference, Electric Circuit Open and Closed Circuit, Series and Parallel Circuits, Parameters of Electric Circuit – Voltage Current, Resistance, Measuring units of current, voltage and resistance, Ohm's law, Kirchhoff's law, Power and Energy, Power Calculation and Energy Consumption, Measurement of Electrical Parameters

CFTOHA 2: Tools and Equipment

Identification and proper use of essential tools and equipment Hand tools: pliers, screwdrivers, wire strippers, etc. Power tools: drills, saws, etc. Measuring instruments: multimeters, voltage testers, etc.

CFTOHA 3: Workplace Health and Safety Measures

Organisation safety and health policy, Appropriate Personal Protective Equipment (PPE), ESD precautions, Types of accident injury or hazard, Importance of cleanliness, air and water quality in the workplace, Importance of time management to meet daily target, Importance of Quality in delivery of work, Organization's policies and procedures and work ethics

CFTOHA 4: Installation of Water Purifier and Maintenance

Water Purifiers, Features and functionalities of various models, Types of Water Purifier – RO Water Purifiers, UF Water Purifiers, UV Water Purifiers, Gravity Based Water Purifiers, Activated Carbon Water Purifiers, Properties of RO Water Purifier, Component of RO Water Purifier, Functioning of RO Water Purifier.

Safety precautions to be taken while installing water purifier, Manual-based procedure of installing the water purifier, Procedure to fix various accessories and parts accompanied the unit, Post fixing checkup process, Functioning of water purifier, Maintenance procedures, Documentation process of installation of water purifier, Customer acknowledgment form, Call center number.

Parameters such as production rate, water chemistry, drain rate, input water pressure/temperature, Different types of water purifiers manufactured by the company, Features of different models of water purifier

Functioning of appliance and its various filters, Components of water purifier – valves or wearing out of membrane or filter, Troubleshooting of water purifier,

Reassembly process, Components/modules of the water purifier, Other products of the company, Cleaning procedures and other best practices.

CFTOHA 5: Mixer, Geyser and Microwave Repair and Maintenance

Assemble, dismantle and operate Mixer/ Grinder, replace dysfunctional part of Mixer/ Grinder, Operate Microwave Oven, Repair and Replace dysfunctional part of Microwave Oven

Counseling and Study Structure

Sl. No.	Course Code	Title of the Course	Credit	Total Hours of Study	Counseling and Study Structure (hours)			
					Face to Face Counseling	Self-study	Practical	Assignments
1	CFTOH A 1	Fundamentals of Electricity and Components	Non-Credit	30	4	26	18	-
2	CFTOH A 2	Tools and Equipment	Non-Credit	60	8	34	18	-
3	CFTOH A 3	Workplace Health and Safety Measures	Non-Credit	60	8	34	18	-
3	CFTOH A 4	Installation of Water Purifier and Maintenance	Non-Credit	60	8	34	18	-
4	CFTOH A 5	Mixer, Geyser and Microwave Repair and Maintenance	Non-Credit	60	8	34	18	-

Study Modules & Books Information

Sr. No	Course Code	Subject Name	Modules to be used
1	CFTOHA 1	Fundamentals of Electricity and Components	Electrical Components - Higher education Pearson
2	CFTOHA 2	Tools and Equipment	<u>Handling of Tools and Equipment, NCERT</u>
3	CFTOHA 3	Workplace Health and Safety Measures	Electrical Safety Handbook, 5th Edition
4	CFTOHA 4	Installation of Water Purifier and Maintenance	<u>Installation, Operation, And Maintenance Manual</u>
5	CFTOHA 5	Mixer, Geyser and Microwave Repair and Maintenance	<u>Field Technician – Other Home Appliances, NCERT</u>

SHORT TERM CERTIFICATE PROGRAMS

S.No.	Program List	Duration	Eligibility
1	Certificate Course in Client Server Technology (CCCST)	4 Months	10th Pass
2	Certificate Course in Network System Administration (CCNSA)	4 Months	10th Pass
3	Certificate in Inverter and UPS Repairing (CIUPSR)	3 Months	12th Pass
4	Certificate Course in Scanner & Printer Maintenance (CCSPM)	2 Months	10th Pass
5	Certificate Course in Monitor & SMPS Repairing (CCMSMPS)	2 Months	10th Pass
6	Certificate Course in UPS & CVT Maintenance (CCUPSCVT)	1 Month	10th Pass

Short terms programs are listed separately along with Academy Programs. The respective Academy can conduct relevant Short Term programs choosing from a list of short term courses. The exam scheme of each program is:

- (1) Theory Paper : 70 Marks
- (2) Assignment : Not Applicable for short term certificate programmes
- (3) Practical/Project : 30 Marks

Thus, every short term program evaluation shall be done on the basis of 100 marks

Note : For Short Term Certificate Programs, only Certificates are provided by the University after conducting examination.