

**Syllabus of**

**DOEACC CERTIFIED COMPUTER MAINTENANCE TECHNICIAN  
(DCCT)**

Total duration: **480Hrs**

Subjects:

SL No	Code	Subject
1.	DCCT-1	Basic Electronics Components and Hardware
2.	DCCT-2	PC-Components & Architecture
3.	DCCT-3	Computer Peripherals & Introduction to Networking
4.	DCCT-4	System Software & Introduction to Internet
5.	DCCT-5	Practical Exam (common for all subjects).



## ***DOEACC CERTIFIED COMPUTER MAINTENANCE TECHNICIAN (DCCT)***

Subject : **BASIC ELECTRONICS COMPONENTS AND HARDWARE**

Theory : 60 Hours.  
Practical : 60 Hours.  
Max Marks (Theory) : 100

Theory Paper : **DCCT-1**

### ***1. WHAT IS A COMPUTER.***

***12hours***

The basic building blocks of a computer system the CPU, the Arithmetic & Logical Unit. The binary numbers as a language which computer understands interprets and processes. The input & Output devices as means of communication with the Computer system. The concept of hardware & the software- the two main components of a computer system. The data & the information. The importance of information flow & its impact on growth & productivity. The need for study of Electronics & Electronic components for understanding the working of computer & Peripherals from hardware Point of view.

### ***2. BASIC ELECTRONICS & PASSIVE COMPONENTS***

***18Hours***

Passive components, Resistance & Capacitance & Inductances. Introduction, Standardization and color codes, characteristics of capacitor, tolerance, temperature coefficient, type of capacitors and their applications.

Introduction to magnetic materials and their properties, inductor, characteristics, types of inductors, their features and specifications transformers, types of transformers.

Fundamentals of AC and its application to circuit theory, energy and power and power in AC. Simple RC, RL, LC & RLC Circuit filters

Introduction to relays, their characteristics, classifications, and performance during pick up and drop out, introduction to switches, different types and their applications.

### ***3. ACTIVE COMPONENTS & INTEGRATED CIRCUITS***

***12Hours***

Introduction to Diodes, their characteristics and applications, Zener diodes, its characteristics and impedance, introduction to Bipolar transistors and its applications, Functions, specification, testing of Diodes and Transistors, Introduction to OPAMP and simple circuits.

Introduction to logic levels & gates, Latches, unidirectional & bi-directional buffers, tri-state devices, clock generators, Flip-flops, Registers counters, Multiplexers & Demultiplexers. Various IC families & their characteristics-Bipolar Logic Family, Uni-polar



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logic families-PMOS, C-MOS, NMOS, Characteristics of Digital ICs, Comparison of digital IC logic families

### ***4. ELECTRONIC CIRCUITS & SYSTEMS***

***12Hours***

Introduction to half wave, full wave and bridge rectifier circuits, introduction to regulated power supplies (linear), power filters, three terminal regulators and regulated power supply using three terminal regulators, Introduction to SMPS, various topologies, study of SMPS used in PCs, current ratings available on various types of SMPS, troubleshooting of SMPS, handling of SMPS

### ***5. TEST & MEASURING INSTRUMENTS***

***6Hours***

Cathode Ray Oscilloscope, Multimeter, Soldering & de-soldering techniques, zero defect soldering, ESD, Heat sinks.

Name of tools used in maintenance like vacuum cleaner, brush, forceps, screw driver set, cutter, pliers, stripper, cleaning solutions.

## ***PRACTICAL TRAINING***

Practical on Passive & Active components

***12Hours***

RC, RLC Circuits & Study of filters

***14Hours***

Making of Half wave & full wave rectifier Circuits and their testing

***8Hours***

Practical on dismantling and assembling of SMPS, study of voltage and Waveforms at different important points & Troubleshooting.

***12Hours***

Practical on Operational Amplifiers, Registers, Counters, Multiplexers & Demultiplexers.

***14Hours***

***Note :Examination for the practicals will be conducted together for all subjects as a single exam DCCT-5***



## ***DOEACC CERTIFIED COMPUTER MAINTENANCE TECHNICIAN (DCCT)***

Subject : **PC COMPONENTS AND ARCHITECTURE**

Theory : 60 Hrs.  
Practical : 60 Hrs.  
Max. Marks (theory) : 100

Theory Paper : **DCCT-2**

### **1. INTRODUCTION TO MICROPROCESSORS (8bit, 16bit, 32bit):- 16Hours**

Introduction to Digital Computers, computer organization, microcomputer Organization, computer language, machine language, architecture of an 8-bit generic microprocessor, simplified memory organization, DMA, interrupts, 8085 architecture and instruction set, steps for program development for 8085. Introduction to 80286, 80386, 80486, comparison, numeric processor 80387, various versions of 80386 and 80486 viz. 80386SX, 80386DX, 80386SX, 80486DX-4, and their comparisons.

### **2.SEMICONDUCTOR MEMORIES 4Hours**

Introduction, memory organization & operation, classification & characteristics of memories, sequential memory, read-only memory & read write memory, DRAM, SRAM, EPROM, EEPROM.

### **3.PENTIUM CLASS OF PROCESSORS & THEIR MAIN FEATURES:- 4Hours**

Pentium processor, Pentium Pro-processor, Pentium MMX Processor, Pentium-II, Celeron Processor, Pentium-III Processor. P1V processor

### **4.THE COMPUTER ARCHITECTURE & MOTHER BOARDS: - 20Hours**

Mother Board, Hard Disk Drives, Floppy disk drives, display systems, Input & output devices and their role in the functioning of Computer system. Block diagram of motherboard, architecture of motherboard, keyboard interface circuit on motherboard; 80486, P4 motherboards. CMOS setup and their features, configuring extended and expanded memory, cache memory, shadow memory, EDO RAM Specifications of a latest Pentium-IV based motherboard

Study of BUS Standards: Brief study of various bus standards: ISA, EISA, VL, PCI, PCMCIA etc.

### **5.DISPLAY CARDS, MONITORS & Floppy DISK DRIVES 16Hours**

Description of different types of display cards, Monitors: CRT construction and working, vertical stage, horizontal stage, 9 pin input type-monitor, block diagram & description of color monitor. Specifications & Troubleshooting guide for a latest color monitor, LCD Monitors.

Various parts of FDDs, types of floppies, geometry of floppy, various concepts of floppy, interface signals, floppy drive alignment track 0, adjustment, formatting of floppies.



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***PRACTICAL TRAINING***

Study of all types of motherboards.	<b>06Hrs.</b>
Study of jumper setting on Pentium motherboards	<b>06Hrs.</b>
Study of interfacing of RAM, ROM keyboard with the mother boards.	<b>10Hrs.</b>
Study of various adapter cards and their functioning and installation.	<b>10Hrs.</b>
Installation of different memory modules on motherboards & Study of different buses and the no. of pins in the different slots corresponding to different buses.	<b>06Hrs.</b>
Assembling and disassembling of PCs, Practicals on assembling of Pentium based PC-ATs with complete installation of mother boards, FDDs etc.	<b>12Hrs.</b>
Study of various types of display cards, AGP cards, assembling & Disassembling of monochrome & Color monitors.	<b>10Hrs.</b>

***Note :Examination for the practicals will be conducted together for all subjects as a single exam DCCT-5***



## ***DOEACC CERTIFIED COMPUTER MAINTENANCE TECHNICIAN (DCCT)***

Subject: **COMPUTER PERIPHERALS AND NETWORKING**

Theory	:60Hrs.
Practical	:60 Hrs.
Max marks (theory)	:100

Theory Paper : **DCCT-3**

### ***1. BIOS, POST, DOS COMMANDS & BATCH FILES***

**12Hrs.**

Concept of BIOS, POST, its error codes and their interpretation, DOS, internal and external commands of DOS detailed description of CMOS setup and meaning of its various settings, C-MOS password setting. The DOS commands, detailed description of DOS batch files config.sys and autoexec.bat, their creation and editing, the commands of config.sys file and their order, a sample of config.sys and autoexec.bat files.

### ***2. DISK DRIVES (Hard disk, CD/DVD drives, Combo Drives) & Printers***

**20Hrs.**

Types of Hard disk, geometry of hard disk, interface signals, various concepts of hard disk formatting types and concepts, functioning of hard disk, precautions in handling hard disks, SATA. USB Flash disks.

Different types of printers and functioning interface signals and cables, printer DIPswitches, printer port, printer driver, printer head. Inkjet printer operation and maintenance, stepper motor. Principle of operation of Inkjet Printers various components of Inkjet Printers, Trouble shooting of Inkjet Printers. Laser Printers-Principle of Operation, Various components of Laser Printers, the stages involved in printing process of Laser Printers, Troubleshooting. Specifications of a latest Inkjet & a Laser Printer.

### ***3. INTRODUCTION TO MULTIMEDIA COMPONENTS:-***

**4Hrs.**

Sound Cards, microphones and speakers, recording on magnetic tape, Digital Recording, Digital Signal Processors (DSP), The MIDI standard.

### ***4. INTRODUCTION TO NETWORKING, TRANSMISSION MEDIA AND NETWORKING HARDWARE***

**4Hrs.**

What is Networking? Local area Network (LAN) Metropolitan Area Networks (MAN) and Wide Area Networks. Network elements.

Network interface cards- Ethernet, Arcnet, Cabling Concept-thin Ethernet, thick Ethernet. Coaxial cables, STP, UTP, Fiber optic. T connectors, BNC connectors, barrle connectors, terminators, Introduction to Repeaters, Bridges, Routers, Networking Topologies - Bus, Star, Token Ring, Mesh etc.

### ***5. INTRODUCTION TO POWER CONDITIONERS &GENERAL TROUBLESHOOTING AND MAINTENANCE OF PCs.***

**4Hrs.**

Introduction to Power Conditioners. Need of UPS for computers, OFF-Line UPS, ON-Line UPS, Concept of cold start, Basic block diagram, Simple troubleshooting techniques. Type of maintenance: Preventive and break down maintenance, assembly and disassembly of PC and its various parts, startup problems, run problems their identification and remedy, problem



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of key board, displays, printers, FDD's, HDD's, SMPS motherboards, their identification and remedy.

### ***PRACTICAL TRAINING***

Examining various error codes and their causes	<b><i>05Hrs.</i></b>
Creating batch files, study and practice of CMOS setup	<b><i>05Hrs.</i></b>
Study of the contents of Config.sys file and their functions.	<b><i>04Hrs.</i></b>
Installation of two HDDs in a PC system.	<b><i>04Hrs.</i></b>
Practicals on dismantling and assembling of Dot matrix, Inkjet and Laser Printers and their Troubleshooting.	<b><i>08Hrs.</i></b>
Practicals on troubleshooting of the PC systems & Peripherals using flow-charting methods.	<b><i>20Hrs.</i></b>
Practical on installation of Network Card in a system and connecting PCs in a LAN using network connectivity Hardware.	<b><i>14Hrs.</i></b>

***Note :Examination for the practicals will be conducted together for all subjects as a single exam DCCT-5***



## ***DOEACC CERTIFIED COMPUTER MAINTENANCE TECHNICIAN (DCCT)***

Subject: **SYSTEM SOFTWARE AND INTRODUCTION TO INTERNET**

Theory	: 60 Hrs.
Practical	: 60 Hrs.
Max Marks (theory)	: 100

Theory Paper : **DCCT-4**

### **1. BASICS OF WINDOWS 2000:-**

**10Hrs.**

Differences between DOS and WINDOWS 2000 operating systems. Starting and existing from a program in WINDOWS 2000, the Desktop, files and folders in Windows 2000, copying and moving files under Windows 2000, the use of explorer, study of control panel and its settings.

### **2. INSTALLATION AND ADMINISTRATION OF WINDOWS 2000/XP:-**

**14Hrs.**

The minimum hardware requirements for the installation, the steps involved in installation of Windows 2000/XP and the troubleshooting during installation. Booting process of Windows 2000/XP, the plug and play feature of Windows- the automatic detection of new hardware at booting time, the boot sector, Architecture of Windows 2000/XP, the Recycle bins, DLL files, the Windows registry and its importance, the device drivers, the addition of new hardware and software to a Windows 2000/XP system, the device manager of Windows 2000/XP, changing of display settings, settings of screen savers and their password protection, configuration of keyboard and mouse in Windows 2000/XP.

### **3. PREVENTIVE MAINTENANCE, BACK-UP PROCEDURES & DISASTER PREVENTION:-**

**12Hrs.**

System testing and diagnosis using available diagnostics programs Different types of Viruses and the Anti Virus programs to remove viruses. The sources and symptoms of different types of virus programs, installation of latest anti-virus programs in the computer system.

Write protection of your software, MS-DOS delete protection, crash recovery, preventing hard disk failures, Back-up & Restore procedures, types of back-up, media for back-up, Raid systems.

### **4. WINDOWS BASED NETWORKING IN A SERVER CLIENT MODEL & PEER TO PEER NETWORKING.**

**14 Hrs.**

The minimum hardware requirement for installation for installation of Windows 2000/XP, Server installation, Configuring a Windows 2000/XP system as a client to Windows network and Password security in Windows. Peer to Peer Networking in Windows, sharing the files and folder level security.

### **5. INTRODUCTION TO INTERNET:**

**10Hrs**

The internet as a source of information, The domain names in the internet, world wide web, configuring a Windows 2000/XP as a station for accessing Internet using dial up networking, after obtaining the internet connection from the Internet service provider, using of



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internet for obtaining information, searching of information, using E-Mail, downloading useful files from different internet sites.

### ***PRACTICAL TRAINING.***

Installation of Windows 2000/XP and practice of using the same in details like adding of new hardware, and software, installation of new devices to the Windows 2000 System and the troubleshooting of related problems **12Hrs**

Installing and usage of latest anti-virus programs **4Hrs**

Practicals on taking the backup of directories, files & complete hard disk on available but reliable media and the restoration **8Hrs**

Practicals on the installation & use of mouse and different scanners **8Hrs**

Installation of Windows2000 Server and clients, practice of using the network **8Hrs**

Use of Internet by each student. **12Hrs**

Practicals on software based troubleshooting of Personal Computers. **8Hrs**

***Note :Examination for the practicals will be conducted together for all subjects as a single exam DCCT-5***



## **DOEACC CERTIFIED COMPUTER MAINTENANCE TECHNICIAN (DCCT)**

### **Eligibility**

10<sup>th</sup> class Pass / +2 / ITI in Engineering subjects.

### **Examination Pattern :**

Questions should be of objective and descriptive nature and there would be at least one question from each of the module in the paper. The objective of the examination is to make an in-depth assessment of the knowledge and skills of the candidate.

Marks for the questions will be distributed proportional to the hours indicated in the syllabus. Detailed guidelines as per general examination procedure.

### **Theory Examination**

Theory examination for each paper would be for duration of **Three Hours** and the total marks for each subject would be 100.

To qualify for a pass in a paper, a candidate must have obtained at least 50% marks in the examination (D Grade).

### **Practical Examination**

This is common for all the modules DCCT-1 to DCCT-4

Number of Practical Examination : One.

Duration of Examination : One and half Hours including viva-voce.

Max. marks in each examination: 100 ( 80 marks for Practical & 20 marks for viva).

To qualify for a pass in practical exam, a candidate must have obtained at least 50% marks in the practical examination (D Grade).

To qualify for a pass in the course, a candidate must have obtained at least 55% marks aggregate in the theory and practical exam combined (C Grade)

### **General**

Hours shown against each of topics are only indicative

### **References :**

1. **Electronic Devices and circuit Theory** by Robert Boylested & Louis Nashelsky
2. **Electronic components** by D.V Prasad  
Radiant Publishing House
3. **PC Hardware a Beginners Guide** by Ron Gilster  
Tata McGraw Hill Publication
4. **Computer Installation and Servicing** by Balasubramanian D
5. **Build your own PC** by Rosenthal, Morris.
6. **Inside the PC** by Peter Norton Tech Media Publication



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**Infrastructure required:**

*(For Training Institute for a batch of 10 students)*

Sl.No	Item	Qty
1.	Digital Multimeters (with Auto ranging)	3Nos
2.	CRO (Dual trace with attenuation probe)	1No
3.	DC Variable Power Supply (0-30V dc, 1Amps)	2Nos
4.	Electronic tool kit (Soldering Iron, De-soldering pump, Screw driver Set, Cutter, Pliers)	2No each
5.	Analog & Digital Components and Bread board (Resistors, Capacitors, Coils, Small Transformers, Different types of diodes, Transistors, MOSFETs, UJTs, Opto isolators, Batteries, ICs, etc)	5Nos each
6.	Digital IC trainer Kit	1No
7.	Micro Processor Trainer kit	1 No
8.	PC for assembling training ( any old PC with add-on cards, Floppy Drives(1.2MB), Hard disk, Key board, Mouse)	1Nos each
9.	PC with Internet Connection.	1No
10.	Different types of Mother Board (Pentium PIV, PII-MMX based), RAM, Hard Disk etc.	1Nos each
11.	Off-Line UPS (500VA)	1No
12.	Printers (Dot Matrix, Laser)	1Nos each
13.	Different types of add-on cards (Display cards, Network card, Sound Card) etc.	1Nos each
14.	Operating system ( Win XP, Windows 2000 Server)	5Nos
15.	Anti Virus Package	1No

