

**SYLLABUS**

**POST GRADUATE DIPLOMA**

**IN**

**HARDWARE TECHNOLOGY AND**

**APPLICATIONS.**

## **SMESTER - 01**

### **PAPER-I ELECTRONICS FOR COMPUTER HARDWARE**

#### **UNIT - 01**      **PASSIVE COMPONENTS**

Resistors: Types of resistors, color code, parallel and series connections, basic uses.

Capacitors: Type of capacitors, color code, parallel and series connection, basic uses.

Inductor: Concept of a coil - inductance, making of an inductor, basic uses.

Transformer: Concept types and uses.

#### **UNIT - 02**      **ACTIVE COMPONENTS**

Semiconductors: Structure of atom, vacancy, conductor, semiconductor insulator. Intrinsic semiconductor, doping, P and N types of semiconductors.

Diodes: P-N Junction, Zener

Transistor: BJT, FET, MOSFET, working and characteristics.

Integrated circuits: Basic concepts.

#### **UNIT - 03**      **CONCEPTS OF CIRCUITS**

Definition of current and voltage, KCl and KVl (Kichoff's current Law and Kirchoff's voltage law), Ohm's Law, R-L, R-C and R-L-C circuits.

#### **UNIT - 04**      **BASIC DIGITAL CONCEPTS**

Number System - Binary - Octal - Hex

Basic logic gate - AND-OR-NOT-XOR, NOR, NAND

Flip flop: R-S D and JK.

Shift registers, counters encoder and decoder

Few Boolean function and simplifications.

#### **UNIT - 05** **HOW TO USE VARIOUS LABORATORY INSTRUMENTS AND DEVICES**

Current meter, voltage meter, Multimeter, Oscilloscope, function generator, soldering iron, PCB, disordering pump.

#### **Text Books:**

- (01) Electronics devices and circuits. By: S. Salivahanen, N. Sureshkumar, A. Vallavraj Tata McGrow Hill.
- (02) Solide - State devices and circuits By: S.P. Bali, New age international publishers Ltd. Willey Eastern Ltd.
- (03) The Basic Electronics By : B. L. Thereja. S.Chand & Co.

**PAPER - II : COMPUTER HARDWARE - I**

**UNIT - 01**                      **FUNDAMENTAL OF COMPUTER:**

Block diagram and brief introduction of each block.  
Types of computers.

**UNIT - 02**                      **PERSONAL/ MICRO COMPUTERS : PC**

Main Parts :        CPU Box, Monitor, & Peripherals [Keyboard, Mouse, Speaker] (A Brief introduction).  
Inside CPU Box :        Motherboard, I/O Cards, Cables, Floppy Drivers, HDD, CD-Drive, SMPS (Brief introduction of each, with their function).

**MOTHER BOARD IN DETAIL:**

Nomenclature, technology, standards AMD CPUs, Cyrix CPUs  
CPUs: CPU over clocking, troubleshooting, CPU problems  
Chip Sets: AMD chip sets, Intel chip sets, VIA chip sets SIS chip sets, OPTI chipsets, Legacy and support ICS  
Mother Boards: PC-XT-AT, and above (like 80286, 80386, 80486 and Pentium)  
The expansion Bus: (Page 297-34 Hardware Pribe)

**UNIT - 03**                      **MEMORY**

Basic Concept - Binary Cell, Semiconductor memory.  
Types of Memory - RAM and ROM in detail  
Memory Chips: RAM and ROM EPROM etc.  
Memory Modules and packaging  
Logical and Physical organization of memory in computer.  
Cache Memory - LX and LZ, EDO.  
Various terms used in computer memory.

**UNIT - 04** :        **PC-ASSEMBLY AND CMOS SETUP AND TROUBLESHOOTING**

Observation of all parts of Floppy drives, HDD, CD, and SMPS.  
Identification of cables and computers.  
Mounting Motherboard in cabinet  
Installation of cards, devices and then connecting cables.  
Fitting of cabinet.  
CMOS - Setup  
Troubleshooting.

**UNIT - 05** :        **BASIC OF PRINTERS**

Types of printers and printing mechanism, How printer works  
Inject printer, working of laser printer, Fonts/Type faces  
Trouble shooting printers.

**Text Books:**

- (01) Hardware bible By : Winn L Rosch, Techmedia publications
- (02) Trouble shooting, maintaining and repairing PCs By :  
Stephon J Bigelow Tata McGraw Hill Publication
- (03) Modern All about printers By : Manohar Lotia, Pradeep  
Nair, Bijal Lotia BPB publications.

**REFERENCE BOOKS:**

- (01) The complete PC upgrade and maintenance guide  
By : Mark Minasi, BPB Publications.

## **PAPER III COMPUTER HARDWARE - II**

### **UNIT - 01**                **KEYBOARD AND MOUSE**

Types of Keyboard function of each key, Types of keys and their construction, Key Matrix, Key identification, some terms Keyboard controller chips, Keyboard installation and trouble shooting, Types of mouse, and their construction, working of mouse, Mouse interfacing chips, Mouse installation and trouble shooting.

### **UNIT - 02 FLOPPY DISK DRIVES (FUNDAMENTAL)**

Drive components, Drive types, Data encoding, Physical working of drive controller, Logical working of FDD, Removing/Adding a drive.

### **UNIT - 03**                **FLOPPY DISK DRIVE - II**

Drive servicing and maintenance, Disk utilities, Floppy drive testing and alignment (Bigelow).

### **UNIT - 04**                **CD-ROM and CD-R drives**

Understanding CD Media, CD-ROM/CD-R standards and characteristics, Drive communication, Understanding the software, creating a bootable CD, Troubleshooting CD-ROM and CD-R drive.

### **UNIT - 05**                **DVD DRIVERS**

Specification and standards, DVD media, DVD drives, the MPEG-2 decoder board, Basic DVD/MPEG-2.

### **Text Books :**

- (01) Modern all about keyboard and mouse By : Manhar Lotia  
BPB publication
- (02) Modern all about Floppy Disk and Drives By : Manahar  
Lotia and Pradeep Nair BPB publication
- (03) Troubleshooting, maintaining and repairing PCs By :  
Stephen J. Bigelow Tata McGraw Hill publications

### **Reference Book :**

- (01) The complete PC upgrade and maintenance guide By : Mark  
Minasi BPB Publication

**PAPER - IV: LIST OF PRACTICALS FOR SEMESTER - I**

- (01) Identification of the various components, measuring their Values and checking of their working
- (02) Characteristics of diode, BJT and FET
- (03) Verification of truth table of FFs and logic gates
- (04) Counter and decoder chip study
- (05) Use of multimeters and oscilloscope
- (06) Study of keyboard and mouse
- (07) Study of dot matrix printer
- (08) Study of inkjet printer
- (09) Study of 1.44 FDD
- (10) Study of 1.2 FDD
- (11) Assembling and disassembling of PC
- (12) Study of CD-ROM and CD-R drives

## **SEMESTER - II**

### **PAPER - V COMPUTER HARDWARE - III**

#### **UNIT - 01**                **HARD DISK DRIVE (HDD)**

HDD Components, Hard Disk features, Logical working of HDD, Installing/upgrading: Hardware and Software perspective  
Troubleshooting HDD.

#### **UNIT - 02**                **DRIVE ADAPTER REFERENCE**

ST506 \* ESDI \* IDE \* EIDE \* Ultra ATA \* Troubleshooting and Drive adapter.

#### **UNIT - 03**                **MONITOR**

Monitor Specification and characteristics, Troubleshooting a CRT, Troubleshooting a color Monitor, Understanding sound cards, Knowing the benchmarks, Using Microphones, Troubleshooting and sound card

#### **UNIT - 04**                **SCSI SYSTEMS**

Understanding SCSI Concepts, Understanding SCSI bus operator  
Understanding PC for SCSI, Troubleshooting a SCSI systems

#### **UNIT - 05**                **SWITCHING MODE POWER SUPPLIES**

Understanding switching power supplies, Connecting the power supply, Troubleshooting SMPS

#### **Text Book :**

- (01) Modern all about Hard Disk Drive By : Manohar Lotia, Pradeep Nair and Bijal Lotia, BPB Publications
- (02) Troubleshooting maintaining and repairing PCs By : Stephen I Bigelow. Tata McGraw Hill Publications

#### **Reference Book :**

- (01) The Complete PC upgrade & Maintenance guide By : Mark Minasi BPB Publications

**PAPER - VI ADVANCE HARDWARE**

**UNIT - 01 PLUG AND PLAY CONFIGURATION AND TROUBLESHOOTING**

Understanding PnP under Windows 95/98, Enabling PnP under DOS, Managing and troubleshooting PNP devices.

**UNIT - 02 REMOVABLE MEDIA DRIVES**

Iomega Zip drive, Iomega Ditto drive, Iomega Bernoulli drives, SyQuest drive.

**UNIT - 03 SERIAL PORT TROUBLESHOOTING**

Understanding asynchronous communication, Understanding Serial Port, Serial Port signals, Troubleshooting serial ports

**UNIT - 04 VIDEO ADAPTERS AND ACCELERATORS**

Understanding Conventional Video adapter, removing video display hardware, Understanding graphics accelerators 3D graphics accelerator cards, Understanding Direct X Video feature connectors, troubleshooting video adapter.

**UNIT - 05 UNDERSTANDING VIDEO CAPTURE/PC TV BOARDS**

Understanding video capture boards, making the most of video capture, Understanding PC-TV boards, troubleshooting video capture and PC-TV boards.

**Text Books:**

- (01) Troubleshooting Maintaining and repairing PCs By :  
Stephen I Bigelow Tata McGraw Hill Publications

**Reference Books**

- (01) The Complete PC upgrade and maintenance guide By : Mani  
Minasi, BP Publication

**PAPER - VII : NETWORKING, INTERNET,  
WEBDESIGNING AND COMMUNICATION PROTOCOLS**

**UNIT - 01**                      **COMMUNICATIONS AND NETWORKING**

Using communication ports and drives, Understanding the components of a LAN, evaluating file server hardware  
Evaluating protocols, frames and communications, using Local area protocols, evaluation Fast Network adapter.

**UNIT - 02**                      **BASICS OF INTERNET**

Concept of Networking, networking topology, networking protocols - TCP/IP, IPX/SPX Net Bus, LAN (Ethernet, Fast Ethernet, Global Ethernet), networking Operations systems NT and Novel, internet terminal and services.

**UNIT - 03**                      **CLIENT/SERVER INSTALLATION**

Introduction to administrations Window NT, installation of Window NT 4.0, configuration NT environment, multiple system policy, file system and partition, configuring portables and networking environment(Client), boot Process.

**UNIT - 04**                      **WEB DEVELOPMENTS**

WWW, websites, browsers, search engines, basic of HTML, basic of Front page.

**UNIT - 05**                      **E-COMMERCE ENVIRONMENT**

Anatomy of E-Commerce, WWW and E-Commerce, E-Commerce Models (B&B. etc.), tools for E-Com, E-Com payment system, selective in E-Com.

**Text Book**

- (01) Upgrading and repairing PCs By : Scott Mueller, Prentice-Hall of India (EGE) care publication
- (02) Internet with Web page, web site design bible  
By : Brian Underdahl and Keith Underdahl IDG Books India
- (03) HTML - 04 PHI publications



**PAPER - VIII: LIST OF PRACTICALS FOR SEM - II**

- Study of Hard Disk Drive
- Basic study of computer : DOS and Windows environment
- Study of various tools and utilities
- Study of Monitors
- Study of linear power supply
- Study of SMPS
- Study of SCSI
- Study of ZIP drives
- Study of PnP
- Video adapters
- PC-TV boards
- Networking tools and practice
- Practicing internet
- Experimenting HTML and Web-Designing
- Client server installation