DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

III YEAR

M SCHEME

VI SEMESTER

2015 – 2016 onwards

COMPUTER HARDWARE AND NETWORKS

CURRICULUM DEVELOPMENT CENTRE

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

M - SCHEME

Course Name : Diploma in Electrical and Electronics Engineering

Subject Code : 34682

Semester : VI

Subject title : COMPUTER HARDWARE AND NETWORKS

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester: 15 Weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Internal Assessment	Board Examination	Total	
COMPUTER HARDWARE AND NETWORKS	5	75	25	75	100	3 Hrs

TOPICS AND ALLOCATION OF HOURS

Sl.No	Topic	Time (Hrs)
1	MOTHERBOARD COMPONENTS AND MEMORY STORAGE DEVICES	13
2	I/O DEVICES AND INTERFACE	13
3	MAINTENANCE AND TROUBLE SHOOTING OF DESKTOP AND MOBILE PHONES	14
4	COMPUTER NETWORK DEVICES AND OSI LAYERS	12
5	802.X AND TCP/IP PROTOCOLS	13
	Revision and Examinations	10
	TOTAL	75

RATIONALE

Maintaining and servicing the computers, laptops and peripherals are essential requirements of the computer students. The clear understanding of computer network devices and protocols are also taught in this subject.

OBJECTIVES

On completion of the following units of syllabus contents, the students can

Identify the major components that make up the system unit.

Understand the principle of operations of Keyboard, mouse and Displays.

Study about the specification of I/O Ports of all I/O devices like serial, parallel, USB – Game port, Blue tooth and IP Connectors

Understand the technology of high quality multiple color graphic output devices like Dot matrix, Inkjet, Laser, Line, MFP and computer system.

Understand the operations to Power Supply devices. Know the use of diagnostic Software.

Identify the major components of Laptop. Troubles shoot the problems in Laptop.

Understand the concept of data communication.

Discuss the advantages and disadvantages of different network topologies. Compare different network classifications based on different category.

Know the use of different network devices.

Understand the different layers of OSI and their functions. Compare different LAN protocols.

Identify the protocols used in TCP /IP and compare with OSI model. Understand IP address concepts and TCP/IP suite.

DETAILED SYLLABUS

UNIT I MOTHERBOARD COMPONENTS AND MEMORY STORAGE DEVICES		**13 HOURS**
1.1	**Introduction:** Parts - Mother board, sockets, expansion slots, memory, power supply, drives and front panel and rear panel connectors – Hardware, Software and Firmware.	**3 Hrs**
1.2	**Processors:** Architecture and block diagram of multi core Processor(any one), Features of new processor(Definition only)-chipsets (Concepts only)	**2 Hrs**
1.3	**Bus Standards** Overview and features of PCI, AGP, USB, PCMCIA, Processor BUS – High	**2 Hrs**
1.4	**Primary Memory**: Introduction-Main Memory, Cache memory –DDR2- DDR3, RAM versions – 1TB RAM – Direct RDRAM	**1 Hrs**
1.5	**Secondary Storage:** Hard Disk – Construction – Working Principle – Specification of IDE, Ultra ATA, Serial ATA; HDD Partition - Formatting. Troubleshooting hard disk drives.	**3 Hrs**
1.6	**Removable Storage:** CD&DVD construction – reading & writing operations; CD-R,CD-RW; DVD-ROM, DVD-RW; construction and working of DVD Reader / Writer. Blue-ray: Introduction – Disc Parameters – Recording and Playback Principles – Solid state memory devices.	**2 Hrs**
UNIT II I/O DEVICES AND INTERFACE		**13 HOURS**
2.1	**Keyboard and Mouse:** Keyboard: Signals – operation of membrane and mechanical keyboards–troubleshooting; wireless Keyboard**.** Mouse- types, connectors, operation of Optical mouse and Troubleshooting.	**3 Hrs**
2.2	**Printers:** Introduction – Types of printers– Dot Matrix, Laser, line printer, MFP (Multi Function Printer), Thermal printer - Operation –Construction – Features and Troubleshooting	**4 Hrs**
2.3	**I/O Ports:** Serial, Parallel, USB, Game Port, Bluetooth interface, IR connector, fire ware, Signal specification problems with interfaces.	**2 Hrs**

2.4	**Displays and Graphic Cards:** Panel Displays– Principles of LED, LCD and TFT Displays. SVGA Port signals – common problems and solutions.	**2 Hrs**
2.5	**Power Supply:** SMPS: Principles of Operation and Block Diagram of ATX Power Supply, connector specifications	**2 Hrs**
UNIT III BIOS, POST and Mobile Phone Servicing		**14 HOURS**
3.1	**BIOS:** Standard CMOS setup, Advanced BIOS setup, Power management, advanced chipset features, PC Bios communication – upgrading BIOS, Flash BIOS - setup.	**2 Hrs**
3.2	**POST:** Definition – IPL hardware – POST Test sequence – beep codes and error messages.	**2 Hrs**
3.3	M**obile phone components:** Basics of mobile communication. Components - battery**-** antenna-ear piece- microphone -speaker-buzzer-LCD- keyboard. Basic circuit board components – Names and functions of different ICs used in mobile phones.	**3 Hrs**
3.4	**Tools & Instruments used in mobile servicing**: Mobile servicing kit -- soldering and de-soldering components using different soldering tools - Use of multi-meter and battery booster.	**2 Hrs**
3.5	**Installation & Troubleshooting:** Assembling and disassembling of different types of mobile phones – Installation of OS - Fault finding & troubleshooting- Jumpering techniques and solutions.	**2 Hrs**
3.6	**Software and Antivirus**: Flashing- Formatting- Unlocking -Use of secret codes- Downloading- Routing;Mobile Viruses – Precautions – Antivirus Software.	**3 Hrs**
UNIT – IV COMPUTER NETWORK DEVICES AND OSI LAYERS		**12 HOURS**
4.1	**Data Communication:** Components of a data communication – Data flow: simplex – half duplex – full duplex; Networks – Definition - Network criteria – Types of Connections: Point to point – multipoint; Topologies: Star, Bus, Ring, Mesh, Hybrid – Advantages and Disadvantages of each topology.	**3 Hrs**
4.2	**Types of Networks:** LAN – MAN – WAN – CAN – HAN – Internet – Intranet –Extranet ,Client-Server, Peer To Peer Networks.	**2 Hrs**
4.3	**Transmission Media:** Classification of transmission media - Guided – Twisted pair, Coaxial, Fiber optics; Unguided – Radio waves – Infrared – LOS – VSAT – cabling and standards.	**3 Hrs**
4.4	**Network devices:** Features and concepts of Switches – Routers(Wired and Wireless) – Gateways.	**2 Hrs**
4.5	**Network Models:** Protocol definition - standards - OSI Model – layered architecture – functions of all layers.	**2 Hrs**
UNIT V 802.X AND TCP/IP PROTOCOLS		**13 HOURS**
5.1	**Overview of TCP / IP :** OSI & TCP/IP – Transport Layers Protocol – connection oriented and connectionless Services – Sockets – TCP & UDP.	**3 Hrs**
5.2	**802.X Protocols :** Concepts and PDU format of CSMA/CD (802.3) – Token bus (802.4) – Token ring (802.5) – Ethernet – type of Ethernet (Fast Ethernet, gigabit Ethernet) – Comparison between 802.3, 802.4 and 802.5	**3 Hrs**
5.3	**Network Layers Protocol:** IP –Interior Gateway Protocols (IGMP, ICMP, ARP, RARP Concept only).	**3 Hrs**

5.4	**IP Addressing :** Dotted Decimal Notation –Subnetting & Supernetting – VLSM Technique-IPv6 (concepts only)	**2 Hrs**
5.5	**Application Layer Protocols:** FTP– Telnet – SMTP– HTTP – DNS – POP	**2 Hrs**

TEXT BOOKS

S.No	Title	Author	Publisher	Year of Publishing / Edition
1.	Computer Installation and Servicing	D.Balasubramanian	Arasan Ganesan Institute of Technology	1993
2.	The complete PC upgrade and Maintenance	Mark Minasi	BPB Publication	1997
3.	Troubleshooting, Maintaining and Repairing PCs	Stephen J Bigelow	Tata MCGraw Hill Publication	2004
4.	Computer Networks	Andrew S.Tanenbaum	Prentice-Hall of India, New Delhi	2002
5.	Data Communication and networking	Behrouz A.Forouzan	Tata Mc-Graw Hill, New Delhi	2006
6.	Data and Computer Communications	William Stallings	Prentice-Hall of India	Eighth Edition 2007

REFERENCE BOOKS

S.No	Title	Author	Publisher	Year of Publishing / Edition
1.	Computer Networks	Achyut Godbole	Tata Mc-Graw Hill - New Delhi	
2.	Principles of Wireless Networks– A unified Approach	Kaveh Pahlavan and Prashant krishnamoorthy	Pearson Education	2002