CITM
Crescent Institute of Technology &Management.
Crescent Community College

DIPLOMA IN COMPUTER HARDWARE & NETWORK MAINTENANCE

WITH LAP - TOP TECHNOLOGIES

SCHEME OF EXAMINATIONS

Subject code	Title of the Paper	Credits	Hours	Passing Minimum
First Semester				
C17CN11	Computer Fundamentals	6	90	40/100
C17CN12	Basics of Computer Hardware	6	90	40/100
C17CN13	System Assembly & Troubleshooting	6	90	40/100
C17CE10	Communicative English	6	90	40/100
C17CNP1	Practical : Computer Hardware	6	90	40/100
Second Semester				
C17CN21	Basics of Networking	6	90	40/100
C17CN22	Network Protocols & Modelling	6	90	40/100
C17CN23	Advanced Networking Technologies & Management	6	90	40/100
C17LS05	Life Skill	6	90	40/100
C17CNP2	Practical : System & Troubleshooting	6	90	40/100
Third Semester				
C17CN30	Operating System	6	90	40/100
C17CN31	Operating System Administration	6	90	40/100
C17CN32	Computer Hardware & Peripherals	6	90	40/100
C17CNP3	Industrial Visit/ Internship	6	90	40/100
C17CNP4	Practical : Operating System	6	90	40/100
Fourth Semester				
C17CN40	Digital Electronics	6	90	40/100
C17CN41	Linux Administration	6	90	40/100
C17CNP5	Practical : Computer Network	6	90	40/100
C17CNPW	Project Work	12	180	40/100

Eligibility for admission: Pass in 10thstd examination conducted by the Govt. of Tamil Nadu Board of Secondary Education, Government of Tamil Nadu or any other equivalent examination.

Examination: Passing Minimum for each paper is 40%. Classification will be done on the basis of percentage marks of the total marks obtained in all the papers and as given below:

40 % but less than 50 % - Third class
50 % but less than 60 % - Second class
60 % and above - First class

Syllabus

First Semester:-

Paper I - Computer Fundamentals
Paper II - Basics of Computer Hardware
Paper III - System Assembly & Troubleshooting
Paper IV - Communicative English
Paper V - Practical I Computer Hardware

Second Semester:-

Paper VI - Basics of Networking
Paper VII - Network Protocols & Modelling
Paper VIII - Advanced Networking Technologies & Management
Paper IX - Life Skill
Paper X - Practical II System & Troubleshooting

Third Semester:-

Paper XI - Operating System
Paper XII - Operating System Administration
Paper XIII - Computer Hardware & Peripherals
Paper XIV - Industrial Visit/ Internship
Paper XV - Practical : Operating System

Fourth Semester:-

Paper XVI - Digital Electronics
Paper XVII - Linux Administration
Paper XVIII - Practical : Computer Network
Paper XIX - Project Work

FIRST SEMESTER

Computer Fundamentals

Unit I:

Introduction to Computers: Introduction – Characteristics of Computers – Evolution of Computers – Generation of Computers – Classification of Computers – Application of Computers.

Unit II:

Input Devices: Keyboard – Pointing Devices – Webcam – Scanners – Optical Character Recognition – Optical Mark recognition – Magnetic Ink Character Recognition – Bar Code Reader.

Output Devices: Printers – Plotters – Computer Output Microfilm – Monitors – Voice Recognition System – Projectors.

Unit III:

Primary memory: Memory Representation – Memory Hierarchy – Random Access Memory – Read only memory – Types of ROM.

Secondary Storage: Classification of Secondary Storage Devices – Storage Organization of Magnetic Disk – Storage Organization of Optical Disk – Magneto-Optical Disk – Universal Serial Bus.

Unit IV:

Database Fundamental: Data, Information and Knowledge – Database – Logical Data Concepts – Physical Data Concepts – Database Management System – Need, Benefits of DBMS, Components of DBMS, Database Administrator – DBMS Architecture – Database Models.

Unit V:

Basic Of Printers: Types of printers and printing mechanism- How printer works-
Inject printer- working of laser printer- Trouble shooting printers.

Reference Books:

1. Introduction to Computer Science, ITL Education Solutions Limited, 2/e, Pearson, 2011.
2. Introduction to Computers, Peter Norton, 7/e, TMH, 2013.

3. Modern All about printers, Manohar Lotia, PradeepNair, Bijal Lotia BPB Publications, 2012.

Basics of Computer Hardware

UNIT I:

Number systems – Decimal, Binary, Octal, Hexadecimal – Conversions– LOGIC GATES – Universal GATES – NAND – NOR – Karnaugh maps –Tabulation and Simplifications- Basics of Sequential and Combinational logic – Multiplexer and De-multiplexer basics – GRAY code – ASCII code representation.

UNIT II:

Introduction to Memories – Types of memories – Registers – Caches – Primary and Secondary memory – Associative memory – Virtual memory– Optical discs – Flash memory systems.

UNIT III:

Basic computer hardware architecture – Functional units – Instruction formats – types – Addressing modes - Basic I/O devices – Keyboard – Console systems – Mouse – Printer – plotters – Scanners – Basic CPU architecture – Introduction to workstations network computers.

UNIT IV:

Standards in PC Architecture- PC/AT System Configuration-Bus Standards – System Bus - Communication Interface – Plug and Play Systems.

Unit V:

Hardware and Software diagnostic tools – Benchmarks- Introduction to 8085 microprocessor- Internal Architecture, Pin Layout - Interfacing – Memory – Instruction Set of 8085 - Addressing modes - Basic programming using 8085.

References Books

1. Charles H. Roth Jr. Fundamentals of Logic design – 4th edition – Jaico publishing house, 2011.
2. Carl Hamacher.V., Zvonko G. Vranesic, Safwat G.Zaky “Computer organization” TMH, 2010.
3. Gaonkar – Micro Processor Architecture programming and application with 8085, Penram International Publishing; 6th edition, 2013.

4. Govindarajulu.B, IBM PC and Clones Hardware trouble shooting and maintenance Tata McGraw-Hill, New Delhi, 2012.

System Assembly & Troubleshooting

Unit I:

Troubleshooting General PC Problems – Introduction- General Troubleshooting rules - Common Problems & Solutions- Preventive Maintenance.

Unit II:

BIOS: Typical Motherboard BIOS, BIOS Features, BIOS & Boot Sequences, BIOS Shortcoming & Compatible Issues, BIOS Troubleshooting, BIOS Upgrades.

Unit III:

Hard Disk: Introduction - Disk Basics - Disk Performance & Characteristics - Drive Construction - Drive Testing & troubleshooting. **Motherboard & Buses:** Introduction, Motherboard Components, Expansion Slots system Bus Functions & Features. Upgrading & Troubleshooting Motherboard, General Bus Troubleshooting.

Unit IV:

Basic Memory Concepts: Introduction - Installing Memories - Upgrade Options & Strategies - Replacing Memories with Higher Capacity - Troubleshooting Memory.

Unit V:

Printers: Printer Technology - How Printer Works - Attaching Printer - Installing Printer Drivers - Preventive Maintenance - Common Printer Problems & Solution – Error Code - Beep Code - Post Code - Post Reader Card.

References Book:

1. Upgrading & Repairing PCs: Muller – Prentice Hall – 10th Edition, 2010.
2. Complete PC Upgrade & Maintenance Guide: Mark Minasi–BPB Publishers–15th Edition, 2014.

Communicative English

Unit I: Learning context

Concept of learning – Learning style –Grammatical framework – sentence framing – paragraph and texts

Unit II: Reading

Basic concept – Purposes of reading-Decoding-Reading materials – Barriers of reading

Unit III: Writing

Basic concept-Writing style-Terminology-stages-English spelling and punctuation – Written texts

Unit IV: Speaking

Language functions-Conversation- Features of spoken English – Types of English course: functional English, English literature, advance English – Phonetic

Unit V: Developing Communication Skills

Meaning –Classroom presence- Features of developing learning process- Practical skills and Listening- uses of communicative English

References

1. Raman,m.&S.Sharma (2011) communication skills,OUP,New Delhi: India
2. Lata,P.&S.Kumar(2011) communication skills,OUP,New Delhi: India,
3.Leech,G&J.Svartvik(2002) A communicative grammar of English,Pearson,India,
4. Sethi,J. and P.V. Dharmija (2007) A course in Phonetics and spoken English.Second edition, Prentice hall: New Delhi

SECOND SEMESTER

Basics of Networking

Unit I:

Communication model - Data communications networking – Data transmission concepts And terminology - Protocol architecture - Protocols - OSI - TCP/IP - LAN architecture Topologies - MAC - Ethernet, Fast Ethernet- Token ring - FDDI- Wireless LANS.

Unit II:

Network layer - Switching concepts - Circuit switching networks - Packet switching - Routing - Congestion control - IP - Unreliable connectionless delivery - Datagram's - Routing IP datagram's - ICMP.

Unit III:

Transport layer - Reliable delivery service - Congestion control - connection establishment – Flow control - Transmission control protocol - User datagram protocol.

Unit IV:

Applications - Sessions and presentation aspects – DNS – Telnet – rlogin - FTP - SMTP – WWW Basics of Firewalls.

Unit V:

Frame Relay - Packet switching networks - Frame Relay networks, Asynchronous transfer mode ATM protocol Architecture - ATM Logical connection - ATM cells - ATM service categories.

Reference Books

1. Computer Networks, Andrew S Tanenbaum, Publisher- PHI, New Delhi, 2010.
2. B. A. Fourozan, TCP/IP Protocol Suite, Tata McGraw Hill, 2011.
3. Internetworking with TCP/IP, Douglas E. Comer, Publisher- PHI, New Delhi, 2013.

Network Protocols and Modelling

Unit I:

Detailed Layered architecture of OSI and TCP/IP Reference Model- Introduction to various LAN and WAN Protocols - Network Address- Overview - Type of Addresses- Need- advantages and disadvantages. IP Addresses- Class Full Addressing- Network ID- Host ID Special Addressing - Subnetting and Supernetting.

Unit II:

ARP/RARP: Resolution - Packet format mapping and encapsulation - Internet protocol Virtual network- Connectionless – unreliable- Packet Delivery System. Datagram format- Datagram size- Network MTU and fragmentation- Time stamp option- IP Routing algorithm IP Checksum- ICMP and IGMP - Introduction and message format.

Unit III:

UDP: Introduction to User Data gram Protocol- Format of UDP Message- Pseudo Header- Multiplexing & Demultiplexing- TCP- Introduction to Transmission Control Protocol- Ports- Collections and Endpoints- TCP Segment Format- Checksum Computation - Establishing a TCP Connection.

Unit IV:

Vector Distance & link state routing protocol - Routing Information Protocol -Open SPF Protocol - Gateway to Gateway Protocol - Hardware Broadcast - Hardware Multicast IP Multicast and Address Mapping - IP Multicast to Ethernet Multicast.

Unit V:

Basics, hardware and Software Requirement for wireless network - Types of wireless network - Wireless technologies - Wireless networking standards -Application of wireless network.

Reference Books

1. Hardware and networking by Vikas Gupta Publisher: Dreamtech press, 2012
2. Introduction to Networking by Richard McMohan Publisher Tata Mcgraw Hills Ltd. India, 2014.

Advanced Networking Technologies and Management

Unit I:

Introduction to Computer Networks - Fundamentals of Network Communication - Network terms - network models - Network Servers.

Unit II:

Network Hardware Essentials - Network repeaters and hubs - Network Switches - Wireless Access points - Network Interface Cards - Routers.

Unit III:

Network Topologies and Technologies - Network Topologies – Bus - Star- Ring - Point -to-point - Ethernet networks and Standards – WIFI - Token Ring Networks - Wireless Access Point - Advanced features of NIC.

Unit IV:

Network Operating System Fundamentals - Operating system fundamentals- Network Operating System-Role of Client and Server Operating System - Centralized User Account and computer management - Server and Network Fault Tolerance - Operating System Virtualization - Installing an OS.

Unit V:

Server Management and Administration - Managing User and Group Accounts - Storage and file System Management, Working with Shared files and Printers, Monitoring system Reliability and performance, Backup and Fault tolerance.

Reference Books:

1. Gregory Tomsho, “Guide to Networking Essentials 6e”, Cengage Learning, 2010.
2. Michael Parmer, “ Hands On Networking Essentials”, Cengage Learning, 2013.
3. Paul Browning, CISCO CCNA simplified, Cisco Press, 2011.

LIFE SKILL

(Common to All Courses)

UNIT- I ATTITUDE : Positive thinking – Goal setting – Problem Solving and Decision making – Leadership and Team Work.

UNIT- II COMMUNICATION SKILLS: Oral communication: Concept of English language – Fluency – Verbal communication in official and public situations.

UNIT-III COMMUNICATION SKILLS: Written Communication: Comprehension – Writing a formal letter like application for Job, enquiry, reply, complaint and such others – preparation of Resume, Curriculum Vitae.

UNIT- IV COMPUTING SKILLS – 1: Introduction to Computers, its various components and their respective functions – Memory storage devices – Microsoft (MS) Office – MS Word.

UNIT - V COMPUTING SKILLS – 2 Internet Basics – Origin of Internet – MODEM – ISP – Upload – Download – e-mail – Origin of worldwide web (www) Browsers – Search engines.

Reference books:

Life skill, Manonmaniam Sundaranar University Publications Division (2011)

THIRD SEMESTER

Operating Systems

Unit I:

Introduction: An Introduction to Operating System & its Services, Various Types of Operating Systems, Operating System Structure - Concepts of: Process – Files – System Calls – Interrupt – Shell.

Unit II:

Process Management: An Introduction to process - Process State & Transition - Process Control Block - Process Context - Context Switch.

Process Scheduling: Pre-emptive & Non-Pre-emptive Algorithms- FCFS-Shortest Job First-**Priority Scheduling:** Round Robin Scheduling- Performance Criteria of Scheduling Algorithm Overview of Inter - process Communication - Critical Section – Semaphore.

Unit III:

Memory Management - Partitioned Memory Management (Static & Dynamic) - Concept of Fragmentation & Compaction - Paging & Demand Paging - Page Replacement Algorithms.

Unit IV:

Deadlock **-** Introduction to Deadlock - Necessary Condition for Deadlock - Method for Handling Deadlock- Brief Overview of Deadlock Prevention - Deadlock Avoidance – Deadlock Detection & Recovery.

Unit V:

File Management **-**File Concepts – Types of Files – File Attributes – File Operations

Access Methods: Sequential access – Random access, Hierarchical Directory System

Reference Books:

1. Operating System Design & Implementation / Andrew S Tanenbaum / Prentice Hall of India, 2014.
2. Operating System Principles – Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, 8th edition, Wiley-India, 2012.

3. Modern Operationg System, Tanenbaum, Third Edition, PHI Publication, 2013.

Operating System Administration

Unit I:

Operating System: Types and Functions. DOS – Introduction, Versions, DOS Commands, Internal, External, Root Directory. Windows – Introduction- Control Panel settings. Installation of server- implementation of DNS server- File System.

Unit II:

Various types of Software Installation – MS-Office 2007 - Office 2010 - Photoshop 7 - PageMaker 6.5 - Corel-Draw X3 - Auto-CAD - Tally 7.0 and ERP - Acrobat Reader X - Java-Visual Studio - C & C++ - Multimedia software's-Internet Browsers.

Unit III:

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 - Fire wire Cards - Modem - Plotter .

Unit IV:

Network Administration - Installing and Configuring Wire & Wireless Network - Network Troubleshooting - Installing Manageable Switches – Routers - Wi-Fi Device – Printer - CCTV Camera - IP Camera and Other Network Devices - Storage Solution – TAP Drive.

Unit V:

WANs and Remote Connectivity - Public networks - Remote connectivity for server and clients - Indoor and Outdoor Wireless – WLAN - WIFI and WIMAX - PCI Wireless Card-USB Wireless Card - Wireless Access Point - Security of networks - Firewalls Hardware and Software - VPN.

Reference Books:

1. Windows 2003 and 2008 Server by BPB Publication, 2012.
2. Windows XP Professional and Windows 7 Edition by BPB Publication, 2011.

Computer Hardware & Peripherals

Unit I:

Microprocessor System - Introduction of System overview - Introduction to Processors- Memory Interfacing - Interfacing I/O Devices - Interfacing Data Converters- Display Interface - Serial I/O and Data Communication - Higher level Processors.

Unit II:

Introduction to PC Architecture - Study of PC-AT/ATX System – Pentium – Core - Core 2 Cord- Core 2 Duo- I3- I5- I7 Processor - Basics of Processor and CPU – Motherboards - Chipset and Controllers - BIOS and the Boot Process - Computer Memory.

Unit III:

Internal Components - IDE and SATA Devices - Hard Disk Drive and CD/DVDs Drives - SCSI Devices, Floppy Disk - Zip Drive- Backup Drive- Expansion Cards - LAN Cards - IDE Card - VGA and SVGA Cards, Sound Card - Interface Cards - I/O cards- Video Cards - USB Card- Fire -Wire Cards - Internal Ports - Cables and Connector Types.

Unit IV:

External Components **- Monitors:-** CRT- LCD and LED Displays- **Printers:-** Dot-Matrix Printer- Inkjet Printer - Laser Printer Scanner - Photo Scanner - Documents Scanner - Bar Cord Scanner – Keyboards – Mouse - External Modem - Ports and Connectors – Batteries - Power supply - Pen Drives - SCSI interface Devices - Laptop Computers - Digital Advance storage technology.

Unit V:

Network Components - Introduction of Network Cable – UTP- STP- Fiber Optics- Hub- Unmanageable Switch - Manageable Switch – Router - Modem - PCI Wireless Card - USB Wireless Device - Print Server - USB Network Sharer - Backup Device - Server Hardware.

Reference Books:

1. Microprocessor Architecture Programming and Application with the 8085 Ramesh Gaonkar Penram International Publication, 2013.
2. Electronics and Radio Engineering M.L. Gupta Dhanpat rai & Sons, New Delhi, 2011
3. PC AND CLONES Hardware, Troubleshooting and Maintenance, B. Govinda rajalu,

Tata Mc-Graw-Hill Publication, 2014.

Digital Electronics

Unit I:

Digital Electronics Introduction - Basic difference between analog and digital Signal - Application and advantages of digital signal processing.

Unit II:

Number System: Decimal - Binary - Why Binary numbers – Binary - Decimal and Hexadecimal number system - Conversion from decimal and hexadecimal to Binary and vice versa - BCD numbers - ASCII code - Basic Concept of parity.

Unit III:

Definition symbols and truth tables –NOT- AND-OR- NAND– NOR- EXOR Gates - combinational logic circuits - Diode Logic- Transistor –Inverter- TTL Logic.

Unit IV:

Brief idea of flip - flops and their operations - RS Latches - Level Clocking - D – Catch - JK Flip- Flops - JK Master – Slave Flip- Flops.

Unit V:

Buffer Register - Shift Register – Synchronous Counters - Ring Counters - ROMs, PROMs and EPROM's – ROMs - Small TTL Memories.

Reference Books:

1. G.K. Kharate, Digital Electronics, Oxford university Press, 2012.
2. M.Morris Mono, Digital Logic and Computer design, Prentice Hall of India, 2011.
3. Donald D.Givone – Digital Principles and Design, Tata mccrraue Hall,2012
4. V.Rajaraman & T.Radhakrishnan, Digital Logic and Computer Organization, Prentice Hall of India Private LTD, 2013.

Linux Administration

Unit I:

Introduction and installation of Linux - History of Linux - Linux distributions - Features of Linux- advantages of Linux - Installation of Red Hat and SUSE Linux and Fedora Edition - System requirements - Disk partition - Mount points - Installation method - creating the boot disk.

Unit II:

Working with Linux GNOME and KDE - User Management - Mounting,-X- windows Desktop environment - Using Gnome and KDE Desktop environment- Linux commands- Linux file system – directories - Text Editors - Linux Shell - Feature of Shell.

Unit III:

Networking with Linux - Installing and setting up a Network card - Setting TCP/IP parameters with Linux - Testing the network - Utilities of Linux- TAR Program - Send Mail - Send mail Configuration – Pine – Browsers - NFS and Samba Configuration - Network Printing and Interoperability with windows.

Unit IV:

Linux Services and Network Security - Administering user accounts and groups - command line tool - Network Services – Proxies – Firewalls - NIS and Host Security - Diskless Terminal.

Unit V:

Web Server - Overview of Clustering - File systems - IP address - DNS and Internet - Security fundamentals - system security - choosing user ID's for services - Network security - IT laws and security.

Reference Books:

1. Linux System Administration Solve Real-life Linux Problems Quickly
   By Tom Adelstein, Bill Lubanovic , O'Reilly Media, 2014.

2. Linux Embedded Development By Alexandru Vaduva, Alex Gonzalez, Chris Simmonds
   Packt Publishing 2016.

Practical 1: Computer Hardware

List of Experiments

1. Connecting & disconnecting computer peripherals and components & driver installation
2. Hard disk partitioning and formatting
3. OS installation like Windows , Linux
4. OS installation like FAT, NTFS
5. Internal component assembling and dissembling
6. Basic trouble shoots using beep Sound
7. Dual OS installation
8. Assigning and identifying valid IP Addresses.
9. Configure network computers using switch
10. Installation of Network Interface Card (NIC).

Practical 2: System & Troubleshooting

List of Experiments

1. Switch Board Wiring and Testing
2. Soldering and De-Soldering Practice
3. Component Testing and Symbols
4. Voltage Measurement of Different Circuits
5. Testing and Measurement of SMPS
6. Half wave, Full wave & Bridge rectifiers
7. Assembling of a Computer
9. Installation of different Operating Systems
10. Installation of different device drivers
11. Installation of different Application Software
12. Biometric Security Device Installation and Configuration
13. To Run All Dos Command (Internal and External Dos Command)
14. Assembling and Dissembling Of a Computer System
15. Troubleshooting and Repair Operating System: Windows XP, Windows 7
16. Installation and Troubleshooting of Printer (Dot-Matrix and Laser Printer)
17. Installation and Troubleshooting of Scanner (Photo & Bar Code Scanner)
18. To Repair and Troubleshooting of SMPS, Monitor, Printer and Motherboard

Practical 3: Operating System

List of Experiments

1. Tacking Data Backup and System Formatting and OS Installation
2. Installation of Different Device and Drivers PCI, PCI-E, AGP
3. Installation of Ms Office 2003, Ms-Office 2007 and Ms-Office 2010
4. Installation of On Board and PCI Device Driver
5. Installation of Web Camera and CCTV Camera Drivers and Software
6. Installation of Application Software: Photoshop 7.0, Page Maker 6.5, CorelDraw 12
7. Installation of CD-DVD Burning Software like: Nero 7.0 & Power ISO 4.0
8. Installation of Tally 7.2 and Tally ERP 9.0 and Tack Data Backup
9. Installation Dual Operating System like: Windows XP and Windows 7
10. Installing and Configuring Windows 2003 and 2008 Server.

Practical 4: Computer Network

List of Experiments

1. Installing and Configuring Windows 2003 and 2008 Server
2. Cable Crimping using Different Color Codes (Straight and Cross Cable)
3. Installation and configuring Peer to Peer and Server-Client Network.
4. Installation and Configuring Active Directory Services.
5. Installation and Configuring DNS & DHCP Services
6. Installation and Configuring FTP, HTTP Services
7. Backup and Restoration for ADS, DHCP and User Data
8. FAT and NTFS Sharing Permission
9. Configuring & Implementing Unmanageable Network Switch
10. Configuring & Implementing Manageable Network Switch
11. Configuring a Local Security Policies & Domain Security Policies
12. Configuring Gateway Service for Internet Connectivity
13. Configuring ADSL+2 Router for Internet Connectivity
14. Installation and Configuring Wire Network
15. Installation and Configuring Wireless Network