

**SCHEME FOR POST GRADUATE DIPLOMA IN
COMPUTER APPLICATIONS (PGDCA)
(EFFECTIVE FROM JULY 2005 BATCH)**

SEMESTER - I		
SUBJECT CODE	SUBJECT NAME	Marks
1PGDCA1	Fundamentals of Computers & Information Technology	100
1PGDCA2	Operating Systems (Dos, Linux, Windows)	100
1PGDCA3	RDBMS Programming in FoxPro	100
1PGDCA4	PC Packages (Word, Excell, Powerpoint)	100
SEMESTER - II		
2PGDCA1	GUI Programming in Visual BASIC	100
2PGDCA2	Internet & E-Commerce	100
2PGDCA3	OOPS & Programming in C++	100
2PGDCA4	System Analysis and Design	100

PRACTICAL & CONTINUOUS EVALUATION

SEMESTER-I		
SUBJECT CODE	SUBJECT NAME	Marks
1PGDCA5	Computer Lab -I	100
SEMESTER-II		
2PGDCA5	Computer Lab- II	100
2PGDCA6	Project Work	100

NOTE :-

- For passing the examination minimum 40% marks must be scored in each passing head individually.
- For passing the overall aggregate marks must be at least 45% in theory & practical separately.
- For the purpose of award of merit or division only the marks obtained in theory heads of all semester together shall be considered.

**1PGDCA1 - FUNDAMENTAL OF COMPUTERS AND
INFORMATION TECHNOLOGY**

UNIT -I

Introduction to Computer and Information Technology

- Brief history of development of computers & Generations of computers
- Computer system concept
- Computer system characteristics
- Capabilities and limitations
- Types of computers-Analog, Digital, Hybrid, General purpose, Special Purpose, Micro, Mini, Mainframe, Super.
- Personal Computer (PCs) – Personal Computer family, Pentium and Newer PCs specifications and their main characteristics.
- Types of PC's- Desktop, Laptop, Notebook, Palmtop etc. their characteristics.
- Computer Organisations and Working
- Basic components & block diagram of computer system - Control unit, ALU, Input/Output and memory their functions and characteristics.
- RAM & ROM -- EPROM, PROM etc.

UNIT-II

Input devices

- Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen.
- Output devices
- Monitors - types -Digital, Analog, characteristics - Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc.
- Printers - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer
- Plotter
- Sound Card and Speakers.

UNIT-III

Storage devices

- Storage fundamentals - Primary Vs Secondary,
- Data Storage and Retrieval methods - Sequential, Direct and

Index Sequential.

- Various Storage Devices - Magnetic Tape, Magnetic Disks, Cartridge Tape, Data Drives, Hard Disk Drives, Floppy Disks, Optical Disks—CD, VCD, CDR, CDRW, DVD, Zip Drive, DAT drive, Pen drive.
- Number system
- Data representation in computers
- Number System of computers- Binary, Octal, Hexa - Representation & their conversion. Coding System - ASCII, BCD, EBCDIC etc.

UNIT - IV

- Computer softwares
- Need, Types of Software - System software, Application software
- System Software - Operating System, Utility program, Assemblers, Compilers and Interpreter
- Operating Systems - Functions, Types- Batch, Single User, Multi User, Multiprogramming, Multiprocessing.
- Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits
- Application Software - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software – their characteristics, uses, examples and area of applications of each of them.
- Computer virus
- Virus working principals,
- Types of viruses,
- Virus detection and prevention
- Viruses on network.

UNIT-V

Data Communication and Networks

- Analog and Digital Signals
- Modulations - Amplitude Modular (AM), Frequency Modulation (FM), Phase Modulation (PM)
- Communication Process, Use of Communication in daily life.
- Direction of Transmissions Flow - Simplex, Half Duplex, Full Duplex
- Communication Software
- Types of Network - LAN, WAN, MAN, etc

- Topologies of LAN - Ring, Bus, Star, Mesh and Tree Topologies
- Communication Protocols – TCP/IP protocol suit
- Communication Channels/Media - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication.
- Components of LAN - NIC, Network Operating System (NOS), Bridges, HUB, Routers, Repeater and Gateways.
- Modem - Working and characteristics
- Types of Connections - Dialup, Leased Lines, ISDN, Broadband.

TEXT & REFERENCE BOOKS :

- *Introduction to Computers and Information Technology by Anurag Seetha, Ram Prasad & Sons, Bhopal.*
- *Computers Today by S.K.Basandra, Galgotia Publications.*
- *Fundamentals of Information technology by Alexis Leon & Mathews Leon, Vikas Publishing House, New Delhi.*



1PGDCA2- OPERATING SYSTEMS (DOS, LINUX, WINDOWS)

UNIT-I

Disk operating systems (DOS)

- Introduction, History & versions of DOS
- DOS basics- Physical structure of disk, drive name, FAT, file & directory structure and naming rules, booting process, DOS system files.
- DOS commands : Internal - DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE etc.
- External - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS etc
- Executable V/s Non executable files in DOS.

UNIT-II

Windows 95/98

- Hardware requirements of Windows. Windows concepts,

features, Windows Structure, Desktop, Taskbar, Start Menu, My Computer, Recycle Bin

- Windows Accessories - Calculator, Notepad, Paint, WordPad, Character map
- Windows Explorer - Creating folders and other Explorer facilities.
- Entertainment- CD player, DVD Player, Media Player, Sound Recorder, Volume Control.

UNIT-III

Advanced Features of Windows

- Managing Hardware & Software - Installation of Hardware & Software, Using Scanner
- System Tools - Backup, Character map, Clipboard Viewer, Disk Defragmenter, Drive Space, Scandisk, System Information, System Monitor, Drive converter (FAT 32)
- Communication - Dial up Networking, Direct Cable Connection, Hyper Terminal, Phone Dialer
- Multiple Users Features of Windows.
- Accessibility Features of Windows.
- Sharing Information between Programs
Understanding OLE
- Embed/Link Using Cut and Paste, Embed/Link Using Insert Object, Manage Embedded/Linked Object

UNIT - IV

Linux

- History & Features of Linux
- Linux Structure
- File system of Linux
- Hardware requirements of Linux
- Various flavours of Linux
- Program & Process
- Process creation and process identifiers
- Functions of profile and login files in Linux
- Linux kernel

UNIT-V

Multi-user features of Linux

- Login and logout from Linux system
- Linux commands - bc, cal, cat, cd, chgrp, chmod, chown, clear, cmp, copy, date, find, ps, kill, ls, mail, mkdir, more,

mv, rm, rmdir, tty, wc, who, whois, grep, write, telnet.

- Pipeline concepts
- Using floppy and cdrom in linux.
- vi editor

Windows NT

- Network concept and components
- Windows NT features & capabilities
- Hardware requirements of Windows NT

NOTE: There is NO practical on Windows NT. Only DOS, Windows and Linux practical are to be performed.

TEXT & REFERENCE BOOKS :

- *DOS Quick reference by Rajeev Mathur, Galgotia Publications*
- *Linux Complete by BPB Publications*
- *Peter Norton Complete Guide to Linux by Peter Norton, Techmedia Publications*
- *Level Module M 1.1 Information technology by Khanna Book Publications, New Delhi*
- *Learning Windows 98 step by step by Rajeev Mathur, BPB Publication*



1PGDCA3 - RDBMS PROGRAMMING IN FOXPRO

UNIT-I

- FoxPro - Versions, features, requirement of Hardware and Software
- FoxPro - Menu System, Working with FoxPro
- Creating Database File Some common operations on data-CREATE, LIST, APPEND, CLOSE, QUIT
- FoxPro - Data Types
- Data Displaying and Monitoring Commands - DISPLAY, LIST, LOCATE, EDIT, CHANGE, BROWSE, REPLACE, DELETE, RECALL, PACK (All Commands with various Options)
- Modify structure, memo field and file utilities -

- File utilities in FoxPro - DISPLAY DIRECTORY, COPY, DELETE, RENAME.

UNIT-II

- Sorting & Indexing Concept
- Sort Commands - Single & Multiple Key
- Advantage & Disadvantages of Sort
- Indexing Vs Sorting, Single & Multiple Key
- Indexing, FIND, SEEK, Rushmore Technology
- Printing reports and labels
- FoxPro Report - its creation, features & Utilities, Preview, Printing Custom Report, grouping & Subgrouping.
- FoxPro Label - Designing & Printing

UNIT-III

- Memory Variables - Creation and Uses, Simple Vs Array
- Saving and Restoring Memory Variables,
- ?/??/??? Commands
- Time & Date Functions and Commands, Date Arithmetic
- Converting Defining Function Keys
- Keyboard Macros - Creating and Using
- Mathematical commands and functions
- Arithmetic Operations, Mathematical Functions, Mathematical Commands, Statistical Functions.

UNIT - IV

- Concepts of FoxPro commands file, Modify Commands
- Conditioning , Branching and Looping within Program files with Do- While Enddo, If - Endif, Scan-Endscan, For - Endfor, Docrase-Endcase, Text - Endtext, Executing Commands from other command files, Macro Substitution
- Error conditions and program debugging aids
- Common Error Messages
- Debugging techniques and commands

UNIT-V

- Concept of Multiple Database Files - Using multiple database files
- Relationing the database - SET RELATION, UPDATE, APPEND FROM, COPY TO, JOIN, Relation Query by Example and SQL

- Custom screens & user define functions & other tools
- Create Custom Screen with @, @_GET, @_EDIT, @_SAY_GET_READ, Creating Box & Lines, User Define Functions, Custom Screen Designing and their Use, FoxDoc for documentation
- Custom Design of Input Screens, Output Screens, and Report formats in Regional Languages (like Hindi etc) in Foxpro 2.6 for Windows and write some programs for this.

TEXT & REFERENCE BOOKS :

- *Foxpro Made Simple* by R.K.Taxali, BPB Publications
- *Mastering Foxpro 2.5* BPB Publications
- *Foxpro 2.6 for Dummies* - Pustak Mahal



1PGDCA4 - PC PACKAGES (WORD, EXCEL, POWERPOINT)

UNIT-I

Word processing : MS Word

- Introduction to Word Processing
- Introduction to MS Word : features, Creating, Saving and Opening documents in Word, Interface, Toolbars, Ruler, Menus, Keyboard Shortcut
- Editing a Document -Moving, Scrolling in a document, Opening Multi document windows, Editing Text-Selecting, Inserting, deleting, moving text,
- Previewing documents, Printing documents - Print a document from the standard toolbar, Print a document from the menu, Shrinking a document to fit a page, Reduce the number of pages by one,
- Formatting Documents : Paragraph formats, Aligning Text and Paragraph, Borders and shading, headers and footers, multiple columns

UNIT-II

Advanced Features of MS Word :

- Find and Replace, Checking the grammar and spelling,

Formatting via find and replace

- Using the Thesaurus, Using Auto Correct, Auto Complete and Auto Text, word count
- Hyphenating, Mail merge, mailing labels Wizards and Templates, Handling Graphics, tables and charts, Converting a word document into various formats like - Text, Rich Text Format, WordPerfect, HTML etc.

UNIT-III

Worksheet : MS Excel

- Worksheet basics
- Creating worksheet, entering data into worksheet, heading information, data, text, dates, alphanumeric, values, saving & quitting worksheet.
- Opening and moving around in an existing worksheet.
- Toolbars and Menus, keyboard shortcuts
- Working with single and multiple workbook - coping, renaming, moving, adding and deleting, coping entries and moving between workbooks.

UNIT - IV

Working with formulas & cell referencing

- Autosum
- Coping formulas
- Absolute & Relative addressing
- Working with ranges - creating, editing and selecting ranges
- Formatting of worksheet- Auto format, changing -alignment, character styles, columnwidth, date format, borders & colours, currency sign.
- Previewing & Printing worksheet - Page setting, Print titles, Adjusting margins, Page break, headers and footers.
- Graphs and charts- using wizards, various charts type, formatting grid lines & legends, previewing & printing charts
- Database - creation, sorting, query & filtering a database
- Functions - Database, Date and Time, Maths & Trigonometry, Statistical, Text and Logical functions
- Creating and Using Macros
- Multiple worksheets- concepts, Creating and Using

UNIT-V

Presentation Graphics : MS Power Point

- Features and various versions

- Creating presentation using Slide master and templates in various colour scheme
- Working with different views and menus of power point
- Working with slides - Make new slide, move, copy, delete, duplicate, lay outing of slide, zoom in or out of a slide.
- Editing and formatting text: Alignment, editing, inserting, deleting, selecting, formatting of text, find and replace text, bullets, footer, paragraph formatting, spell checking.
- Printing presentation - Print slides, notes, handouts and outlines
- Inserting Objects - Drawing and inserting objects using ClipArt's, pictures and charts.
- Slide sorter, slide transition effects and other animation effects
- Presenting the show- making stand alone presentation, Pack and go wizards.

TEXT AND REFERENCE BOOKS :

- *Learning Word 97 for Windows by Rajeev Mathur, BPB Publication*
- *Learning Excel 97 for Windows by Rajeev Mathur, BPB Publication*
- *A First course in Computers by Sanjay Saxena, Vikas Publishing House Pvt. Ltd. New Delhi.*
- *Microsoft Office 97 by Gini Courter & Annette Marquis, BPB Publications*
- *Office 97 Interactive Course by Greg Perry, Techmedia.*

2PGDCA1 - GUI PROGRAMMING IN VISUAL BASIC**UNIT-I**

- Integrated Development Environment of Visual Basics
- Integrated Development Environment of VB, User Interface Designing, Basics of Event driven programming.
- Form - Designing, Showing & Hiding

UNIT-II

- Datatypes & Control Statements
- Data Types, Variables & Constant, Arrays, Dynamic Arrays, Array as function, Collections, Procedures, Arguments passing, Functions Return Values.
- Control Flow Statements : if-then, if-then-else, Select case, looping statement: Do- Loop, For-next, While-Wend, Nested Control Structure, Exit stmt.

UNIT-III

- Building Blocks of Visual Basic
- Basic Active X Control & Their Use - Text box, List box, combo box, Scroll bar, Slider & Fire Controls.
- Advance Active X Control - Common Dialog controls, Color, font, File open, file save, print help, tree View & list View Controls.

UNIT - IV

- Components of Visual Basic
- Graphics controls, Image Handling in VB, Coordinate System, Graphics methods- Text Drawing, Lines & Shape, Filling Shapes, Grid methods.
- Menu editor: Pull-down and Pop-up menus
- Multiple Document interface- Parent & Child Forms & Methods.
- Error handling: Types of Errors, Error handling methods and functions

UNIT-V

- Database programming with Visual Basic
- Database programming with VB - DATA Control - methods, Properties, Visual data manager, Connectivity with database, DATA bound controls.

TEXT & REFERENCE BOOKS :

- *Beginner's Guide to Visual Basic 6* By Reeta Sahoo & G.B. Sahoo, Khanna Publishing House
- *Beginning Visual basic 6* By Peter Wright, Shroff Publishers
- *Mastering Visual Basic 6* By Evangelos Petroustos , BPB Publications

**2PGDCA2 - INTERNET & E-COMMERCE****UNIT-I**

- Internet - Evolution, Protocols, Interface Concepts, Internet Vs Intranet, Growth of Internet, ISP, Connectivity - Dial-up, Leased line, VSAT etc., URLs, Domain names, Portals, Application.
- E-MAIL - Concepts, POP and WEB Based E-mail ,merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free E-mail services.
- INTERNET protocols-Data Transmission Protocols, Client/Server Architecture & its Characteristics, FTP & its usages. Telnet Concept, Remote Logging, Protocols, Terminal Emulation, Massage Board, Internet chatting - Voice chat, text chat.

UNIT-II

- Word wide web (www)-History, Working, Web Browsers, Its functions, Concept of Search Engines, Searching the Web, HTTP, URLs, Web Servers, Web Protocols.
- Web publishing - Concepts, Domain name Registration, Space on Host Server for Web site, HTML, Design tools, HTML editors , Image editors, Issues in Web site creations & Maintenance, FTP software for upload web site.

UNIT-III

- HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Color controls, Different HTML tags, Table

layout and presentation, Use of font size & Attributes, List types and its tags, Use of Frames and Forms in web pages

UNIT-IV

- Javascript Overview, syntax & conventions.
- Variables, Expressions, Branching & Looping statements, Functions, Arrays
- Objects, Events & Document Object Model – onClick, onMouseOver, onSubmit, onFocus, onChange, onBlur, onLoad, onUnload.
- Alerts, Prompts & Confirms.

UNIT - V

- E-COMMERCE: What is Electronic Commerce? Historical development, Key success factors in e-commerce, E-commerce problems, Product suitability, B2B, B2C, Advertising-Based Models, Community-Based Models, Business-to-employee electronic commerce, Electronic Data Interchange, Internet fraud, E-marketing, Disintermediation, Bricks and clicks business model, Reintermediation, Online auction business model

TEXT & REFERENCE BOOKS :

- *O level Module - M 1.2 - Internet & web page designing* by V.K.Jain – BPB Publications.
- *Internet for Everyone* - Alexis Leon and Mathews Leon, Vikas Publishing House Pvt. Ltd., New Delhi
- *Internet for Dummies* - Pustak Mahal, new Delhi
- *A Beginner's Guide to HTML* available at: <http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimerAll.html>
- *Introduction to JavaScript* available at – www.mcu.ac.in/Javascriptguide.pdf
- *E-Commerce Study Material* available at – [www.mcu.ac.in/ Electronic-Commerce-2005.pdf](http://www.mcu.ac.in/Electronic-Commerce-2005.pdf)



2PGDCA3 - OOPS AND PROGRAMMING IN C++

UNIT -I

Object-Oriented Programming Paradigm, Basic Concepts of Object-Oriented Programming, Benefits of OOPs, Object-Oriented Languages, Applications of OOP, C++ Statements, Class, Structure of C++ Program, Creating the Source File, Compiling and Linking.

UNIT-II

Introduction, Tokens, Keywords, Identifiers, Basic Data types, User Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialisation of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Dereferencing Operators, Manipulators, Type Cast Operator, Expressions and Implicit Conversions, Operator Precedence, Control Structures.

UNIT-III

Specifying a Class, Defining Member Functions, Making an Outside Function Inline, Nesting of Member Functions, Private Member Function, Arrays within a Class, Memory Allocation for Objects, Static Data Member, Static Member Functions, Arrays of Objects, Object as Function Arguments.

Constructors and destructors : Introduction, Constructors, Parameterized Constructors, Multiple Constructors with Default Arguments, Dynamic Initialisation of Objects, Copy Constructors, Dynamic Constructors, Constructing Two-Dimensional Arrays, Destructor.

Functions in C++: The Main Function, Function Prototyping, Call by reference, Return by Reference, Inline Functions, Default Argument, Const. Arguments, Function Overloading, Friend and Virtual Function.

UNIT - IV

Operator overloading and type conversions: Introduction, Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators Using Friends, Manipulation of strings using Operators, Rules for Overloading Operators, Type conversions.

UNIT-V

Inheritance: extending class - Introduction, Defining Derived

Classes, Single Inheritance, Making a Private Member Inheritable, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance.

Pointers, virtual functions and polymorphism

Compile time Polymorphism, run time polymorphism, Pointers to Objects, This Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

TEXT & REFERENCE BOOKS :

- *Object Oriented Programming with C++ by E.Balaguruswami, TMH Publications*
- *Object Oriented Programming in C++ by Nabajyoti Barakati SAMS PHI Pvt. Ltd*



2PGDCA4 - SYSTEM ANALYSIS AND DESIGN

UNIT -I

- The System Concept, Characteristics, Elements and Types of a system.
- The System Development Life Cycle, Considerations for candidate systems, rototyping.
- The Role of System Analyst

UNIT-II

- System planning and Initial Investigation
- Information Gathering, information gathering tools.
- Structured Analysis, The Tools of Structured Analysis (DFD, Data Dictionary, Decision tree and Pseudo Codes, Decision Tables), pros and cons of each tool.
- System performance definition, description of outputs, Feasibility Study
- Cost/Benefit Analysis: Data Analysis, Cost/Benefit Analysis, The system proposal.

UNIT-III

- The Process and Stages of System Design: Design methodologies, development activities.
- Input design, output design, forms design, types of forms, basics of form design, layout considerations and forms control.

UNIT - IV

- File structure, file organization, objectives of database, data structure.
- System Testing and Quality Assurance, Why system testing, what do we test for, the test plan quality assurance, trends in testing, role of data processing auditor. Training and Documentation.

UNIT-V

- Implementing and software maintenance, Conversion, combating resistance to change, post implementation review, software maintenance.
- Hardware/Software Selection and the Computer Contract, suppliers, procedure for hardware/software selection, financial considerations in selection, the computer contract.
- System Security, Disaster Recovery Planning

NOTE :- Various real life case studies and examples in every stages of system analysis and design may be taken.

TEXT & REFERENCE BOOKS

- *System Analysis and Design, Elias M. Awad, Galgotia Publications (P) Ltd.*
- *System Analysis and Design, International Ed., Perry Edwards, McGraw Hill Publications.*