

**MAHARSHI DAYANAND UNIVERSITY, ROHTAK**  
**Scheme of Examination (Semester System)**

**B.Sc. Part-I/II/III with Information Technology as a subject**

Year	Semester	Paper	Name of the Paper	Max. Marks	Internal Assessment	Exam. Hours	
First	1 <sup>st</sup>	1.1	Fundamentals of Information Technology-I	40	10	3	
		1.2	C Programming Language-I	40	10	3	
		1.3	Practical (based on Paper-1.1 & 1.2)	50	-	4	
	2 <sup>nd</sup>	2.1	Fundamentals of Information Technology-II	40	10	3	
		2.2	C Programming Language-II	40	10	3	
		2.3	Practical (based on Paper-2.1 & 2.2)	50	-	4	
	Second	3 <sup>rd</sup>	3.1	Programming Using C++ - I	40	10	3
			3.2	Computer Networks and Internet Programming-I	40	10	3
			3.3	Practical (based on Paper-3.1 & 3.2)	50	-	4
4 <sup>th</sup>		4.1	Programming Using C++ - II	40	10	3	
		4.2	Computer Networks and Internet Programming-II	40	10	3	
		4.3	Practical (based on Paper-4.1 & 4.2)	50	-	4	
Third		5 <sup>th</sup>	5.1	Programming in Visual Basic and Oracle-I	40	10	3
			5.2	Linux Operating System-I	40	10	3
			5.3	Practical (based on 5.1 and 5.2)	50	-	4
	6 <sup>th</sup>	6.1	Programming in Visual Basic and Oracle-II	40	10	3	
		6.2	Linux Operating System-II	40	10	3	
		6.3	Practical (based on 6.1 and 6.2)	50	-	4	

# FIRST YEAR

## First Semester

### Paper – 1.1 Fundamentals of Information Technology-I

Max. Marks: 40

Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

**1. Basic of Computers and Number Systems:**

Block diagram of a computer, booting process, introduction to the concepts-bit, byte, word, hardware, operating system and application software, machine, assemblers, loaders and linkers.

**2. Operating System-DOS, Windows and Unix**

Features of DOS, Windows and Unix operating systems and their comparison. Internal and External commands of DOS, file and directory management commands such as DIR, COPY, TYPE, DEL DELTREE, UNDELETE, CHKDSK, FORMAT, XCOPY, SCANDISK, CREATING BATCH files using REM, ECHO, PAUSE, IF GOTO, AUTOEXEC.BAT and CONFIG.SYS files. Concepts of windows, menu, icon, opening, closing and resizing windows, creating folder, Using Start, control panel, recycle bin and online help, using windows explorer to manage files and directories.

**3. Overview of UNIX** structure, general purpose UNIX commands such as date, echo, cal, bc, pwd, passwd; file and directory commands such as ls, mkdir, cp, mv, rm process management commands such as ps, kill, nohup, communication commands such as news, msg, wall; working with editor introduction to shell programming.

### Suggested Readings:

1. Essentials of Computers and Network Technology by Nasib Singh Gill, Khanna Book Pub. Co., New Delhi.
2. Singh Rajender: Application of IT in Business, Ramesh Publishers, Jaipur.
3. Computers Today by S.K. Basandra, Galgotia Publications.
4. Computers Today by Sanders
5. Computer Fundamentals by P.K.Sinha.
6. Fundamentals of Computers by V. Rajaraman
7. PC Software made simple by R.,K.Texali-Tata Mc Graw Hills
8. Understanding PC Tools by Peter Dysen
9. Understanding Norton Utilities by Peter Dysen.
10. MS Office by Ron Manafield BPB Publications.
11. Information Technology by Curtin
12. Computer Science Theory and Applications by E.Balaguruswammy and B.Sushil.
13. Compact Guide to Windows, word and Excel by Ron Mansfield , BPB Publications.

## Paper – 1.2 : C Programming Language-I

Max. Marks: 40  
Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

1. **Overview of Programming:** Introduction to computer based problem solving: requirements of problem solving by the computer, Problem identification, Problem definition, Example for problem solving, Problem solving strategies: Problem Design and implementation issues: Problems and Algorithms, Top-Design and stepwise refinement (breaking a problem into sub tasks).
2. **Data organization or data structures),** constructions of loops basis programming establishing initial conditions, terminating conditions, implementation (use of procedures for Modular Design, Choice of variable names, documentation of program, program testing); programming environment, Programming language classification.
3. **C Language, History, Structure of a C program:** Data types( int, float, char, double, void), Data structure, Constants and variables, variable declaration (integer, float, character, logical variable, string variable), Constraints, operators and Expression; Arithmetic operators, Relational Operators, logical operators, Expressions, Control construct, if then, for while; Arrays : Array declaration one and two dimensional arrays; Functions- Fundamentals: General form, function arguments, Return value, basic I/O: Formatted Input/Output, Unformatted Input/Output, Program Design examples, advance features; Typed modifiers and storage class specifier for data type , Bit Operators? Operator, & operators, \* operators. Type casting. Type casting conversion.

### Suggested Readings:

1. Yashwant, Kanetkar : Let Us C, BPB Publications.
2. Gottfried, B : Theory and Problem of Programming in C, Schaums' Series.
3. Kernighan & Ritchie : The C Programming Language, PHI  
C Problem Solving and Programming, PHI.

## Paper –1.3 : Practical (Based on Paper 1.1 & 1.2)

### Second Semester

## Paper – 2.1 Fundamentals of Information Technology-I

Max. Marks: 40  
Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

## 1. **Input & Output devices**

Various input devices such as keyboard, mouse, joysticks; output devices such as monitor (CGA, VGA, EGA and SVGA)), different types of printers and plotters.

Primary and secondary memory, Cache, extended and expanded memory.

Removable and non-removal secondary memory: tapes, disks, CDROM, DVD, comparison of these devices based on technology and speed.

Organization of data on disk : Tracks, sectors, cylinders, heads, access time, seek time and latency time.

Typical configuration of a Pentium Computer, Functional description of various modules, cards and uses in a PC.

## 2. **Computers and Communication**

Single-user, multi-user, and client-server system; distributed and Parallel systems; Hardware & Software components of computer networks, Network topologies for LAN, & WAN , Various services and their use.

## 3. **Installation and using Application Software and Data Management Tools**

Installing and understanding the features and applications of the following software: MS-WORD, MS\_EXCEL, MS\_POWER POINT, Virus detection, prevention and anti-virus packages

### **Suggested Readings:**

1. Essentials of Computers and Network Technology by Nasib Singh Gill, Khanna Book Pub. Co., New Delhi.
2. Computers Today by S.K. Basandra, Galgotia Publications.
3. Computers Today by Sanders
4. Computer Fundamentals by P.K.Sinha.
5. Fundamentals of Computers by V. Rajaraman
6. PC Software made simple by R.,K.Texali-Tata Mc Graw Hills
7. Understanding PC Tools by Peter Dysen
8. Understanding Norton Utilities by Peter Dysen.
9. MS Office by Ron Manafield BPB Publications.
10. Information Technology by Curtin
11. Computer Science Theory and Applications by E.Balaguruswamy and B.Sushil.
12. Compact Guide to Windows, word and Excel by Ron Mansfield , BPB Publications.

## Paper – 2.2 : C Programming Language-II

Max. Marks: 40

Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

1. **Advanced Programming Techniques:** Control constructs: do-while, switch statements, break and continue, exit () function, goto and label; Functions: Parameter passing-call by value and call by reference, calling functions with Arrays, argv and argc; Recursion.
2. **Basic concepts. Design examples (Tower of Hanoi Recursive quick sort);** Dynamic Data structures in C: Pointers, the & and \* operators, Pointer expression, pointer assignment Pointer arithmetic, Pointer comparison. The dynamic allocation functions – malloc and calloc, Pointer, Vs Arrays, Arrays of pointer, Pointer to Pointers, Initialising Pointers, Pointers to functions, function returning Pointer, Functions with variable number of Arguments; Structures: Basics of Structures, Declaring a structure, Referencing structure elements, Array of structures, Passing structures to functions, passing entire structure to functions, Structure Pointers, Declaring a structure pointer.
3. **Arrays and structures within structures Unions:** Declaration, Uses, Enumerated Data types, typedef, Example algorithm: linked list: insertion, deletion and search; File Handling: The file Pointers, file accessing functions (fopen, fclose, putc, getc, fprint); C preprocessor: define, # include, #undef, #conditional compilation directives (#if, #else, #elif, #endif, #def and #ifndef); C Standard Library and Header files, Header files (stdlib.h), type.h, string.h, math.h, stlib.h, time.h) etc., Standard library functions, string functions, Mathematical functions, Date and time functions, Variable argument list function, Utility functions, Character class test functions.

### Suggested Readings:

1. Yashwant, Kanetkar : Let Us C, BPB Publications.
2. Gottfried, B : Theory and Problem of Programming in C, Schaums' Series.
3. Kernighan & Ritchie : The C Programming Language, PHI  
C Problem Solving and Programming, PHI.

### Paper –2.3 : Practical (Based on Paper 1.1 & 1.2)

## SECOND YEAR

### Third Semester

#### Paper – 3.1: Object Oriented Programming using C++ - I

Max. Marks: 40

Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

1. **Concept of object Oriented Programming:** Object, Class Encapsulation, Data Hiding, Inheritance, Polymorphism, Analysis and design of system using object approach.

2. **Structure of a C++ program and Classes:**  
Include files, Declaration of an object, Main function, I/O streams.

Class declaration: Data members, Member Function, Private and Public members, data hiding and encapsulation, arrays within a class.

3. **Class and objects:**

Class function definition: Member function definition inside the class declaration and outside the class declaration, scope resolution operator, Private and public member function, nesting of member functions.

Creating objects, accessing class data members, accessing member functions, arrays of objects, objects as function arguments: Pass by value, pass by reference, Pointers to objects.

#### Suggested Readings:

1. Stropstrup : The C++ Programming Language/Addison Wesley.
2. Robert Lafore : OOP in Turbo C++/Galgotia
3. E.Balagurusamy : Object Oriented Programming with C++.TMH
4. Herbert, Schildt : Schildt's Advanced Win95 Prog. In C & C++/mh

## Paper- 3.2: Computer Networks and Internet Programming - I

Max. Marks: 40  
Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

### 1. **Computer Networks**

Introduction: Network definition, Network hardware and software network topologies, uses of computer Networks, OSI reference model, TCP/IP reference model. Comparison of OSI & TCP/IP reference models.

### 2. **Physical Layer** : Transmission Media, Switching, ISDN and its service, Multiplexing, Modems.

Data Link Layer : Design issue, Error detection and correction codes, elementary data link protocols, static and dynamic channel allocation, Introduction to IEEE standards, sliding window protocol.

### 3. **Network Layer** : Design issues, routing algorithms, shortest path routing, flooding, broadcast & Multicast routing congestion control and internet working.

Application Layer : Network security & privacy, data compression and cryptography. Electronic mail, The WWW, Multimedia, Audio, Video, Remote login, file transfer.

### Suggested Readings:

1. Computer Networks by A.S. Tanenbaum, PHI
2. Essentials of Computers and Network Technology by Nasib Singh Gill, Khanna Book Pub. Co., New Delhi.
3. Internet 6 in 1 by Kraynak & Hubraken, PHI 2000
4. Using the Internet by Kasser, PHI, 4<sup>th</sup> Ed, 2000
5. Using the World Wide Web by WALL, PHI, 2<sup>nd</sup> ed, 2000
6. Using HTML by Phillips, PHI, 4<sup>th</sup> ed, 2000\
7. Special Edition using Front Page 2000 by Randall & Jones, PHI, 2000
8. An Introduction to Java Programming by Liang, PHI, 2000
9. Dynamic HTML by Cambell, B. Techmedia
10. Java Script by Jeff Frentzen & Henry Sobotka, Tata McGraw Hill, 1998
11. Local Area Networks by William Stallings, Macmillian Pub. Co.
12. Data Networks by Black, PHI.
13. Introduction to Networking by Bary Nance, PHI

### Paper- 3.3: Practical (Based on Papers 3.1 and 3.2)

## Fourth Semester

### Paper – 4.1: Object Oriented Programming using C++ - II

Max. Marks: 40  
Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

**1. Constructors and Destructors**

Constructors: Declaration and definition, default constructors, parameterized constructors, copy constructors, destructors: Definition and use.

**2. Function overloading**

- a) Function overloading: declaration and definition.
- b) Inheritance- Extending classes

Concept of inheritance, basic class, derived class, defining, derived classes, visibility modes, private, public, protected; single inheritance: privately derived, publicly derived, making a protected member inheritable, access control to private and protected members by members function of a derived class, multi-level inheritance, nesting of classes.

**3. Data Structures:**

Linked Lists, Queues, Stacks and Trees, Sorting algorithms.

#### Suggested Readings:

1. Stropstrup : The C++ Programming Language/Addison Wesley.
2. Robert Lafore : OOP in Turbo C++/Galgotia
3. E.Balagurusamy : Object Oriented Programming with C++.TMH
4. Herbert, Schildt : Schieldt's Advanced Win95 Prog. In C & C++/mh

### Paper- 4.2: Computer Networks and Internet Programming - II

Max. Marks: 40  
Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

**1. Internet Programming**

Internet : Evolution of Internet, Future of Internet, Services provided on the Internet, Internet Access Methods.

World Wide Web : Evolution of W W W, Future of W W W, Fundamentals of W W W



Hypertext Markup Language: Introduction, Building Blocks of HTML, Lists, Links, Images in HTML.

2. ***Advanced HTML***: Tables, Frames, Layers, Forms, Editors Cascading Style Sheets: Introduction, CSS positioning Front Page: Installing Front Page Editor, Create a sample website, frames in Front Page, Forms, Database Pages.

Installing Netscape Communicator, Browsing internet using Netscape, Netscape Messenger.

3. ***Fundamentals of Java Programming***

### **Suggested Readings:**

1. Introduction to Networking by Bary Nance, PHI
2. Essentials of Computers and Network Technology by Nasib Singh Gill, Khanna Book Pub. Co., New Delhi.
3. Internet 6 in 1 by Kraynak & Hubraken, PHI 2000
4. Using the Internet by Kasser, PHI, 4<sup>th</sup> Ed, 2000
5. Using the World Wide Web by WALL, PHI, 2<sup>nd</sup> ed, 2000
6. Using HTML by Phillips, PHI, 4<sup>th</sup> ed, 2000\
7. Special Edition using Front Page 2000 by Randall & Jones, PHI, 2000
8. An Introduction to Java Programming by Liang, PHI, 2000
9. Dynamic HTML by Cambell, B. Techmedia
10. Java Script by Jeff Frentzen & Henry Sobotka, Tata McGraw Hill, 1998
11. Computer Networks by A.S. Tannennaum, PHI
12. Local Area Networks by William Stallings, Macmillian Pub. Co.
13. Data Networks by Black, PHI.

### **Paper- 4.3: Practical (Based on Papers 4.1 and 4.2)**

# THIRD YEAR

## Fifth Semester

### Paper – 5.1: Programming in Visual Basic and Oracle - I

Max. Marks: 40

Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

#### **1. Visual Basic**

Visual Basic IDE : An Overview, the new project dialog, IDE elements and features, starting a new project or opening and existing one, saving your projects, setting environment, editor and general options, adding different modules to a project, the edit menu; the toolbox: Adding control to forms, adding components to the toolbox, the properties window, the Project explorer the form layout the format menu, making effective use of the code window; the object browser, the , menu editor, debugging tools, compiling executables.

Event-Driven Programming : Working with Visual Basic source Files, using the MSGBOX Function when an event is fired, adding code to a form click Event; Properties and Methods in Visual Basic : Properties, Methods, Event Firing order : Form Startup Events: From User Responses Events, Form Shutdown Events; The MSG-Box Function and Query Unload, Adding Code to Form and control events, Basic Concepts to Object-Oriented Programming, Encapsulating VB Dialog; Understanding Class Modules : Properties, Methods, Using class Properties and Methods, Creating, Firing and Handling.

**2. Visual Basic Language Overview:** VB code lines and comments, Identifiers, constants and Variables, using option explicit, numbers, operators, control loops and conditional statements, modules, subroutines and Functions, passing Arguments, programmer Defined Structures, Arrays; Speaking the Language of Objects; Using ActiveX controls, using ActiveX components.

Handling Errors : Kinds of errors, Syntex and compile time errors, Some guidelines for testing programs, On error, Resume and Resume next; The Error Object : The Raise method, common Trappable errors, The last DLL Error property; Raising and Error : Raising a user identifier Error; Debugging Tools, Using Assertions.

**3. Introduction to RDBMS:** Approaches to Data Management, Database management – An Evolutionary Phenomenon, Introduction to DBMS, The 12 Rules (Codd's Rules) for and RDBMS, Relational Database Management System (RDBMS), Oracle Server and Oracle Database, Oracle Products.

Introduction to SQL Plus :

Introduction to SQL, Oracle Data Types, Starting SQL Plus, Querying database tables, Conditional retrieval of rows, Working with Null Values, Matching a pattern from a

table, ordering the result of a Query Aggregate Functions, Grouping the Result of a Query, ROLLUP Operations: - Getting Cross Tabs, Command Summary of SQL Plus Editor./Getting Sub Totals, CUBE operations :

### **Suggested Readings:**

1. Harold Davis : Visual Basic Secrets.
2. Natham Gurewich and Ori Gurewich : Visual Basic in 21 days Fourth Edition.
3. Brierley, E: Visual Basic 6 How to/ Techmedia
4. Cornell, G : Visual Basic 6 from the Groundup/TMH.
5. Evangelos, Petroustor : Mastering VB 6.0, BPB.
6. Jerke, N : The Complete Reference VB 6.0, TMH.
7. Cornel, Gary : Visual Basic from the Ground up, TMH
8. Vijay Mukhi : Mastering Oracle 6.0, BPB Publications, 1992.
9. James T. Perry & Josoph G. Lateer : Understanding Oracle, BPB

### **Paper – 5.2 : Linux Operating System - I**

Max. Marks: 40

Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

**1. Introduction to Operating Systems :** Its need and services, Simple Batch Systems, Multi programmed batched systems, Time sharing systems, Parallel system, distributed systems and real time systems.

**Introduction to Linux :** What is Linux's History, Minimum System Requirements; Installing Linux; Working with Linux, Floppy-less Installation, Boot and Root Disks, Choosing Text or Graphic Installation, Setting up your Hard Drive, Formatting the partitions, Setting up the Ethernet Configuration X, Selecting packages to Install, Using LILO; Portioning the Hard Disk : Linux Swap Space Partitions, Linus's fdisk, enabling the Swap space for Installation, Creating the Linux File-system partition, Using LILO.

**2. Using Linux:** Starting and Stopping your Linux System, Linux Shutdown Commands, Login, Password, Creating a New Login, Logging out; Trying out your new Login : Linux Error Messages, Search Paths; The who Command, Commands and Programs.

**Basic Linux Commands :** How Linux Commands Work, Command options, Other Parameters, Input and output Redirection, National conventions used to describe Linux commands, Online help available in bash shell help facility; Wildcards : \* and ?, Environment Variables, Process and How to Terminate them, The process status Commands : Ps, The process termination command : kill Becoming someone else, the su command, the grep command.

**3. Using the File System:** File overview, Common types of files, filenames, Directories and Overview, Parent directories, The root directory, How directories are named, The home directory; Navigating the Linux file system: pwd command,

Absolute and relative filenames; cd command, Creating and Deleting files : Cat, Creating Directories, Moving and Copying files.

Moving and Copying with Wildcards

Moving Directories, Removing files and directories , Fear of Compression : The Zipless file, Important directories in the Linux file System : /, /home, /bin, /usr/spool, /dev, /usr/bin, /sbin ,etc./ usr/bin.

### **Suggested Readings:**

1. Tim Parker : Linux Unleashed Third Edition, Techmedia, 1999
2. Tackett, J : Special Edition using LINUX, PHI
3. Norton, P. : Complete guide to LINUX, Techmedia.
4. Komarinski, M : LINUX System Administration Handbook, AW.

### **Paper- 5.3: Practical (Based on Papers 5.1 and 5.2)**

#### **Sixth Semester**

### **Paper – 6.1: Programming in Visual Basic and Oracle - II**

Max. Marks: 40

Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

#### **1. Querying Multiple Tables :**

Collating Information : Equi Joins, Cartesian Joins, Other- Joins, Self Joins, SET operators : Union, Intersect, Minus; Nested Queries.

Functions:

Functions, Column Functions: Arithmetic Functions, Character Functions, Date Functions, General Function, Group Functions.

#### **2. Data Manipulation and Control –I**

Data Definition Language (DDL), Creating Tables, Creating a Table with data from another table, Inserting Values into a Table, with data from Another table, Deleting Row (s) from a Table, Dropping a Column, Introduction to Views, Manipulation the Base table(s) through views, Rules of DML Statements on Join Views, Dropping a View, Inline views, Materialized views.

Data Manipulation and Control –II

Database Security and Privileges, Grant Command, Revoke Command. Applications Privileges Management, Enhancing Reference, Sequences, Maintaining Database Objects, COMMIT and ROLLBACK.

#### **3. PL/SQL-I**

Introduction to PL/SQL. The Advantage of PL/SQL block Structure. PL/SQL Architecture, Fundamentals of PL/SQL Data Types, variables and Constants, Scope and Visibility of a variable, Assignments, and Expression, Operator Precedence, Referencing Non-PL/SQL Variables, Built-in-Function, Conditional and Interactive Control, SQL, Within PL/SQL Code, Composite Data types.

#### PL/SQL-II

Cursor Management in PL/SQL, Cursor Manipulation, Implicit cursor Attributes, Exception Handling in PL/SQL Predefined Exceptions, User Defined Exception.

#### Suggested Readings:

1. Harold Davis : Visual Basic Secrets.
2. Natham Gurewich and Ori Gurewich : Visual Basic in 21 days Fourth Edition.
3. Brierley, E: Visual Basic 6 How to/ Techmedia
4. Cornell, G : Visual Basic 6 from the Groundup/TMH.
5. Evangelos, Petroustor : Mastering VB 6.0, BPB.
6. Jerke, N : The Complete Reference VB 6.0, TMH.
7. Cornel, Gary : Visual Basic from the Ground up, TMH
8. Vijay Mukhi : Mastering Oracle 6.0, BPB Publications, 1992.
9. James T. Perry & Joseph G. Lateer : Understanding Oracle, BPB

#### Paper – 6.2 : Linux Operating System - II

Max. Marks: 40

Time : 3 Hrs.

**Note:** *Eight questions in all will be set by the paper setter with minimum two questions from each Unit and the candidates shall be required to attempt five questions in all by selecting at least one question from each unit. All questions shall carry equal marks.*

**1. File and Director Permissions:** File and Directory, ownership, User and ownership, Groups, changing group ownership, File Permission, UMASK Setting, Changing file Permission, Changing directory permission; Bash: What is Shell ? How the Shell gets Started, The most common Shells; The Bourne Again Shell: Commandline Completion, Wildcards, Command History, Aliases, Input Redirection, Output Redirection, Pipelines Shell m Prompts, Job control, Customzing bash, bash commands, bash variables.

Linux – tcsh : An Introduction totcsh, Command completion. Wildcards, Command completion wildcards, Command History, Aliases, Input and Output Redirection, Pipelines, Prompts, Job Control; Key Bindings, Correcting Spelling Errors, Pre-Commands, Change directory Commands, Monitoring Logins and Logouts, Customizing tcsh, tcsh Command Summary, tcsh variables.

**2. Shell Programming:** Creating and Running Shell Programs, Using variables : Assigning a value to a variable, Accessing the value of a variable, positional Parameters and other Built-In Shell variables; The Importance of Quotation Marks : The test Command, The tcsh Equivalent of the test command, Conditional Statements : If Statement, case Statements; Iteration Statements : for Statement, While Statement, untill Statement, shift Command, select Statement repeat Statement, Functions.

Editing and Typesetting : Text Editors vi, The vi Editor, Starting vi, vi modes, Inserting Ttext, Quitting vi, Moving the Cursor, Deleting Text, Copying and Moving Text, Searching and Replacing Text, Setting Preference.

**3. *Linux for System Administrators*:** System Administration Basucs, The root Account, Starting and Stopping the System, Booting from a Floppy, Using LILO to Boot, Shutting Down Linux; Mounting File Systems : Mounnting a Floppy, creating as New file System, Un-mounting file System, Checking file Systems, Using a file as Swap Space; Compressing files with gzip and compress : Using tar, Backups, Setting up your System: Setting the System Name, Using a Maintenance Disk, Forgetting the root Password, Setting the Login Message.

Networking & Network Services: What is TCP/IP ? Hardware Requirements, Configuring Linux Files, Setting up the Dummy Interface, Configuration Files, Testing and Troubleshooting, The netstat Command, ping, Mail, News, NFS, NIS, www, FTP, DNS.

**Suggested Readings:**

1. Tim Parker : Linux Unleashed Third Edition, Techmedia, 1999
2. Tackett, J : Special Edition using LINUX, PHI
3. Norton, P. : Complete guide to LINUX, Techmedia.
4. Komarinski, M : LINUX System Administration Handbook, AW.

**Paper- 6.3: Practical (Based on Papers 6.1 and 6.2)**