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

B.Sc. Part-I/II/III with Computer Science as a subject

Year	Semester	Paper	Name of the Paper	Max. Marks	Internal Marks	Exam Hours
First	1st	1.1	Computer Fundamentals and Programming in C - I	40	5	3
		1.2	Computer Architecture & Networking - I	40	5	3
		1.3	Practical & Viva-voce (Based on Paper-1.1)	60	-	4
	2nd	2.1	Computer Fundamentals and Programming in C - II	40	5	3
		2.2	Computer Architecture & Networking - II	40	5	3
		2.3	Practical & Viva-voce (Based on Paper-2.1)	60	-	4
Second	3rd	3.1	Data and File Structures - I	40	5	3
		3.2	Object-oriented Design and C++ - I	40	5	3
		3.3	Practical & Viva-voce (Based on Paper-3.1 and 3.2)	60	-	4
	4th	4.1	Data and File Structures - II	40	5	3
		4.2	Object-oriented Design and C++ - II	40	5	3
		4.3	Practical & Viva-voce (Based on Paper-4.1 and 4.2)	60	-	4
Third	5th	5.1	Database Management System, Oracle and Visual Basic - I	40	5	3
		5.2	Software Engineering - I	40	5	3
		5.3	Practical & Viva-voce (Based on Paper-5.1)	60	-	4

6th	6.1	Database Management System, Oracle and Visual Basic - II	40	5	3
	6.2	Software Engineering - II	40	5	3
	6.3	Practical & Viva-voce (Based on Paper-6.1)	60	-	4

FIRST YEAR

First Semester

Paper-1.1: Computer Fundamentals and Programming in 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.***

Unit-I

Introduction : Historical evolution of computers, Classification of computers, Model of a digital computer, Functioning of a digital computer, Usefulness of computers, Human being Vs computer, Computer as a tool, Applications of computers (desktop publishing, sports, design and manufacturing, research and design, military, robotics, planning & management, marketing, medicine & health care, arts, communications).

Number Systems: What is Number system, necessity of binary number system, binary, octal and hexadecimal number system, inter-conversion of numbers, binary arithmetic, character codes.

Unit-II

Input/Output Devices: Punched cards, card-readers, key-punching machines, keyboards, mouse, joysticks, trackballs, digitizer, voice-recognition, optical-recognition, scanners, terminals, point-of-sale terminals, machine-vision systems.

Hard-copy devices: Print quality, Impact printers - DMPs, Daisy-wheel printers, Line-printers, Drum printers, Chain printers; Non-impact printers - Inkjet, Laser, Thermal, LED; Plotters. Soft-copy devices : monitors, video-standards (VGA and SVGA).

Memory & Mass Storage Devices: Characteristics of memory systems, types of memory, RAM, ROM, magnetic disks - floppy disk, hard-disk; optical disks - CD, CD-I, CD-ROM; Magnetic tapes; Concepts of Virtual and Cache memory.

Unit-III

Software Concepts: Introduction, types of software - System & Application software; Language translators - Compiler, Interpreter, Assembler; Operating system - Characteristics, bootstrapping, types of operating, operating system as a resource manager; BIOS; System utilities - Editor, Loader, Linker, File Manager. Concept of GUI, GUI standards.

Suggested Readings:

1. Gill, Nasib S.: Essentials of Computer and Network Technology, Khanna Book Publishing Co., New Delhi
2. Singh, Rajender: Application of IT in Business, Ramesh Publishers, Jaipur.
3. Donald Sanders: Computers Today, McGraw-Hill Publishers.
4. Davis: Introduction to Computers, McGraw-Hill Publishers.
5. V. Rajaraman : Fundamental of Computers, Prentice-Hall India Ltd., New Delhi.
6. Gottfried: C Programming (Schaum's Outline Series), Tata McGraw-Hill Publishers.
7. Kanetkar: Let Us C, BPB Publications, New Delhi.
8. E. Balagurusamy: C Programming (Tata McGraw-Hill Publishers)

Note : Latest and good books may be added from time to time.

Paper 1.2: Computer Architecture and Networking-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.***

Unit-I

Basic building blocks and Circuit Design: OR, AND , NOT, XOR Gates; De Morgan's theorem, universal building blocks, laws and theorem of Boolean algebra, Simplifying logic circuits—sum of product and product of sum form, algebraic simplification, Karnaugh simplification; arithmetic circuits.

Unit-II

Combinational and Sequential Circuits, Flip-Flops, Counters, shift registers, Decoders and Encoder, Multiplexer and De-multiplexer circuits.

Unit-III

Register transfer and Micro-operations: Register transfer Language, Bus and Memory Transfer, Arithmetic Logic Micro-operations, Shift Micro-operations.

Basic computer organization and Design: instruction and instructions codes, computer instructions, timing and control, instruction cycle, memory references instructions, input- output and interrupts;

Suggested Readings:

1. M. Mano: Computer System Architecture, Prentice-Hall of India Ltd., New Delhi.

2. Gill N.S. and Dixit J.B.: Digital Design and Computer Organisation, University Science Press (An Imprint of Laxmi Publications), N. Delhi)
3. William Stallings: Computer Architecture and Organisation, Maxell Publication.
4. Mano, M.M.: Digital Design, 2nd ed., Prentice-Hall of India.
5. Salivahanan and Arivazhagan: Digital Circuits and Design, Viaks Publ. House Pvt. Ltd.,
6. Nasib S. Gill: Essentials of Computer and Network Technology, Khanna Book Publishing Co., New Delhi.
7. J.P. Hayes: Computer Architecture and Organisation by J.P. Hayes, Tata McGraw-Hill, New Delhi.
8. Gear C.W.: Computer Organisation and Architecture, Prentice Hall of India Ltd., New Delhi.

Note: Latest and good books may be added from time to time.

Paper-1.3: Practical based on Paper-1.1

Max Marks : 60
Time Allowed: 4 Hrs

Note:

i) Practical (OS and MS-Office) : 45 Marks
ii) Viva-voce : 15 Marks

Second Semester

Paper-2.1: Computer Fundamentals and Programming in 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.***

Unit-I

Basic concepts of programming, problem solving, algorithm designing and flowcharting, concept of structured programming.

Elements of C: C character set, identifiers and keywords, Data types: declaration and definition.

Unit-II

Operators: Arithmetic, relational, logical, bitwise, unary, assignment and conditional operators and their hierarchy & associativity.

Data input/output. Control statements: Sequencing, Selection: if and switch statement; alternation, Repetition: for, while, and do-while loop; break, continue, goto.

Unit-III

Functions: Definition, prototype, passing parameters, recursion.

Data Structures: Arrays, struct, union, string, data files.

Pointers: Declaration, operations on pointers, array of pointers, pointers to arrays.

Program development in C.

Suggested Readings:

1. Gottfried: C Programming (Schaum's Outline Series), Tata McGraw-Hill Publishers.
2. Kanetkar: Let Us C, BPB Publications, New Delhi.
3. E. Balagurusamy: C Programming (Tata McGraw-Hill Publishers)
4. Donald Sanders: Computers Today, McGraw-Hill Publishers.
5. Davis: Introduction to Computers, McGraw-Hill Publishers.
6. V. Rajaraman : Fundamental of Computers, Prentice-Hall India Ltd., New Delhi.

Note : Latest and good books may be added from time to time.

Paper 2.2: Computer Architecture and Networking-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.***

Unit - I

Central Processing Unit: General Register organization, Stack Organization, Instruction formats, Addressing Modes, Data and Transfer Manipulation, Program Control, Reduced Instruction Set Computer.
Input-Output Organization: Peripheral devices Input-Output interface, Asynchronous
Data transfer, Modes of transfer, Priority interrupt, Direct Memory Access (DMA), input-output processors (IOP).

Unit - II

Computer Networking: Introduction to Computer Network, Why computer Network? Types of computer network, Network topology, Internet and its hardware & software requirements, applications of Internet (E-mail, Mailing lists, WWW, FTP, Telnet, Gopher, WAIS, UIRC, Usenet), overview of Intranet and its applications.

Hardware requirements for LAN, Transmission channel for LAN, Network Interface Unit, Servers & Workstations, LAN software, Introduction to Ethernet, token ring; hub, Switches, Bridges, routers.

Unit - III

Private Networks: ISDN, PSTN, PSDN, Value Added Network, OSI Model, TCP/IP Model, Network Protocols, Applications of Computer Network.

Suggested Readings:

1. M. Mano: Computer System Architecture, Prentice-Hall of India Ltd., New Delhi.
2. Gill N.S. and Dixit J.B.: Digital Design and Computer Organisation, University Science Press (An Imprint of Laxmi Publications), N. Delhi)
3. William Stallings: Computer Architecture and Organisation, Maxell Publication.
4. Mano, M.M.: Digital Design, 2nd ed., Prentice-Hall of India.
5. Salivahanan and Arivazhagan: Digital Circuits and Design, Viaks Publ. House Pvt. Ltd.,
6. Nasib S. Gill: Essentials of Computer and Network Technology, Khanna Book Publishing Co., New Delhi.
7. A.S. Tanenbaum: Computer Networks (4th ed.), Prentice-Hall of India.
8. W. Tomasi: Introduction to Data Communications and Networking, Pearson Education.
9. P.C. Gupta: Data Communications and Computer Networks, Prentice-Hall of India.
10. Behrouz Forouzan and S.C. Fegan: Data Communications and Networking, McGraw Hill.
11. L. L. Peterson and B. S. Davie: Computer Networks: A Systems Approach, Morgan Kaufmann.
12. William Stallings: Data and Computer Communications, Pearson Education.
13. J.P. Hayes: Computer Architecture and Organisation by J.P. Hayes, Tata McGraw-Hill, New Delhi.
14. Gear C.W.: Computer Organisation and Architecture, Prentice Hall of India Ltd., New Delhi.

Note: Latest and good books may be added from time to time.

Paper-2.3: Practical based on Paper-2.1

Max Marks : 60
Time Allowed: 4 Hrs

Note:

i) Practical (Programming in C) : 45 Marks
ii) Viva-voce : 15 Marks

SECOND YEAR

Third Semester

Paper-3.1: Data and File Structures - 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.***

Unit-I

Data structure and its essence, Data structure types.

Linear and list structures: Arrays, stacks, queues and lists; Sequential and linked structures; Simple lists, circular lists, doubly linked lists.

Unit-II

Inverted lists, threaded lists, Operations on all these structures and applications. Arrays; Multi-dimensional arrays, sequential allocation, address calculations, sparse arrays.

Unit-III

Tree structures: Trees, binary trees and binary search trees. Implementing binary trees, Tree traversal algorithms, threaded trees, trees in search algorithms, AVL Trees, Polish notation and expression trees.

Suggested Readings:

1. Lipschutz: Data Structures (Schaum's Outline Series), Tata McGraw-Hill.
2. Adam Drozdek: Data Structures and Algorithms in C++, Vikas Pub. House (Thmpson), New Delhi.
3. Gupta Amit: Data Structures Through C, Galgotia Booksource Pvt. Ltd., New Delhi.
4. Sofat S.: Data Structures With C and C++, Khanna Book Pub. Co.(P) Ltd, N. Delhi.
5. Dromey R.G: How to Solve it by Computer ?, Prentice Hall India.
6. Loomis: Data Structure and File Management, Prentice-Hall India Ltd.
7. Tannenbaum: Data Structure Using C, Tata McGraw-Hill.

Note: Latest and good books may be added from time to time.

Paper-3.2: Object-Oriented Design and 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.***

Unit-I

Object-Oriented Concepts: Data abstraction, encapsulation, classes and objects, modularity, hierarchy, typing, concurrency, persistence.

Unit-II

Object-Oriented Methodology: Advantages and disadvantages of OO methodologies. Modeling, Domain analysis. OMT Methodology- Object Model, links and associations, multiplicity, link attributes, role names, ordering qualification, aggregation, generalization and inheritance, abstract class, meta data, object diagram.

Unit-III

Dynamic Model-events, states, scenarios, event traces, state diagram. Functional Model-data flow diagrams. Analysis, system design and object design.

Suggested Readings:

1. Balagurusamy, E.: Object-Oriented Programming With C++, Tata McGraw-Hill.
2. Subburaj, R.: Object-Oriented Programming With C++, Vikas Pub. House, New Delhi.
3. Rumbaugh, J. et. al.: Object-Oriented Modelling and Design, Prentice Hall of India.
4. Booch, Grady: Object-Oriented Analysis & Design, Addison Wesley.
5. Chndra, B.: Object Oriented Programming Using C++, Narosa Pub. House, New Delhi.
6. Stroustrup, B.: The C++ Programming Language, Addison-Wesley.
7. Lippman: C++ Primer, 3/e, Addison-Wesley.
8. Schildt, Herbert: C++: The Complete Reference, 2/e, Tata McGraw-Hill

Note: Latest and good books may be added from time to time.

Paper 3.3: Practical based on Paper-3.1 & 3.2

Max Marks : 60
Time Allowed: 4 Hrs

Note:

i) Practical : 45 Marks
(Implementation of data structure in C & Programming in C++)
ii) Viva-voce : 15 Marks

Fourth Semester

Paper-4.1: Data and File Structures - 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.***

Unit-I

Graph data structure and their applications. Graph traversals, shortest paths, spanning trees and related algorithms.

Family of B-Trees: B-tree, B*-Trees, B+ Trees.

Unit-II

Sorting: Internal and External sorting. Various sorting algorithms, Time and Space complexity of algorithms.

Searching techniques and Merging algorithms. Applications of sorting and searching in computer science.

Unit-III

Physical storage devices and their characteristics, constituents of a file viz. Fields records, fixed and variable length records, primary and secondary keys.

File operations, Basic file system operations, File Organizations serial sequential, Indexed sequential, Direct, inverted, multilist. Hashing functions and collision handling methods.

Suggested Readings:

1. Lipschutz: Data Structures (Schaum's Outline Series), Tata McGraw-Hill.
2. Adam Drozdek: Data Structures and Algorithms in C++, Vikas Pub. House (Thmpson), New Delhi.
3. Gupta Amit: Data Structures Through C, Galgotia Booksource Pvt. Ltd., New Delhi.
4. Sofat S.: Data Structures With C and C++, Khanna Book Pub. Co.(P) Ltd, N. Delhi.
5. Dromey R.G: How to Solve it by Computer ?, Prentice Hall India.
6. Loomis: Data Structure and File Management, Prentice-Hall India Ltd.
7. Tannenbaum: Data Structure Using C, Tata McGraw-Hill.

Note: Latest and good books may be added from time to time.

Paper-4.2: Object-Oriented Design and 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.***

Unit-I

Fundamentals of C++, Data types, structs vs classes, static data & member function, constant parameters & member functions, friend functions & friend classes, control statements, arrays and pointers.

Unit-II

Role of constructors & destructors, dynamic objects, operator overloading, function overloading, inheritance, virtual functions, abstract class, virtual class, template functions & template classes.

Unit-III

Exception handling, Files and streams, stream classes, data structures using C++, ASCII & Binary files, sequential & random access to a file.

Program development in C++.

Suggested Readings:

1. Balagurusamy, E.: Object-Oriented Programming With C++, Tata McGraw-Hill.
2. Subburaj, R.: Object-Oriented Programming With C++, Vikas Pub. House, New Delhi.
3. Rumbaugh, J. et. al.: Object-Oriented Modelling and Design, Prentice Hall of India.
4. Booch, Grady: Object-Oriented Analysis & Design, Addison Wesley.
5. Chndra, B.: Object Oriented Programming Using C++, Narosa Pub. House, New Delhi.
6. Stroustrup, B.: The C++ Programming Language, Addison-Wesley.
7. Lippman: C++ Primer, 3/e, Addison-Wesley.
8. Schildt, Herbert: C++: The Complete Reference, 2/e, Tata McGraw-Hill

Note: Latest and good books may be added from time to time.

Paper 4.3: Practical based on Paper-4.1 & 4.2

Max Marks : 60
Time Allowed: 4 Hrs

Note:

i) Practical : 45 Marks
(Implementation of data structure in C & Programming in C++)
ii) Viva-voce : 15 Marks

Third Year

Fifth Semester

Paper-5.1: Database Management System, Oracle and Visual Basic -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.***

Unit-I

Basic Concepts: File systems Vs. DBMS, advantages and disadvantages of DBMS, objectives of a database. Database systems concepts and architecture.

Data Modeling for a database: records and files, abstraction and data integration.
Database Management System: Relational, Network, and Hierarchical.

Unit-II

Relational Data Manipulations: Relational Algebra, Relational Calculus, SQL.
Relational Database Design: Functional Dependencies, Finding Keys; 1^{st} to 3^{rd} NFs, BCNF, Lossess Join and Dependency preserving decomposition, computing closures of set FDs, Finding Keys.

Unit-III

Practical database design: Role of information systems in organizations, database design process, physical database design in relational databases.

Query Processing: General Strategies for query processing, query optimization, query, processor, concepts of security, concurrency and recovery.

Database security issues and recovery techniques.

Suggested Readings:

1. Using Visual Basic 6 by Reselman & Other (Prentice-Hall of India)
2. Visual Basic 6 from Scratch by Donald & Oancea (Prentice-Hall of India)
3. Using Oracle-8 by Austin (Prentice-Hall of India)
4. Oracle 8 by Ivan Bayross (BPB Publication)
5. Special Edition Using Oracle 8/8i by Jr. Page (Prentice-Hall of India)
6. Teach Yourself More VB in 21 days by Days Maver (Techmedia)
7. Any other book/manual covering contents of this paper.

Note: Latest and good books may be added from time to time.

Paper-5.2: Software Engineering - 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.***

Unit-I

Software and software engineering: Software characteristics, software crisis, software engineering paradigms, goals and principles of software engineering.

Software project management: Planning a software project, Software cost estimation, project scheduling, personnel planning, team structure.

Unit-II

Software configuration management, software quality and quality assurance, project monitoring, risk management.

Software requirement analysis – Structured analysis, object-oriented analysis and data modeling, software requirement specification, validation.

Unit-III

Design and implementation of software- Software design fundamentals, software design principles, design methodology (structured design and object-oriented design), design strategies, design verification, monitoring and control, coding, programming styles.

Suggested Readings:

1. Gill, Nasib S.: Software Engineering, Khanna Book Pub. Co.(P) Ltd, N. Delhi.
2. Singh, Rajender: Software Engineering, Excel Books, New Delhi.
3. Jalote, Pankaj: An Integrated Approach to Software Engineering, Narosa Publications, New Delhi.
4. Pressman : Software Engineering, TMH.
5. Ghezzi, Carlo : Fundaments of Software Engineering, PHI.
6. Fairley, R.E. : Software Engineering Concepts,McGraw-Hill.

Note : Latest and good books may be added from time to time.

Paper-5.3: Practical based on Paper-5.1

Max Marks : 60
Time Allowed: 4 Hrs

Note:

i) Practical : 45 Marks
(Application Development Using Oracle & Visual Basic)
ii) Viva-voce : 15 Marks

Sixth Semester

Paper-6.1: Database Management System, Oracle and Visual Basic -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.***

Unit-I

Oracle

Introduction to Oracle: Modules of Oracle, Invoking SQLPLUS, Data types, Data Constraints, Operators, Data manipulation - Create, Modify, Insert, Delete and Update; Searching, Matching and Oracle Functions.

SQL*Forms: Form Construction, user-defined form, multiple-record form, Master-detail form. PL/SQL Blocks in SQL*Forms, PL/SQL syntax, Data types, PL/SQL functions, Error handling in PL/SQL, package functions, package procedures, Oracle transactions.

SQL*ReportWriter: Selective dump report, Master-detail Report, Control-break Report, Test report.

Unit-II

SQL*Menu: Various menu styles, using pull-down & bar-menu, Authorization of SQL*Menu, Creating Oracle Menu, Granting Role Access, Generating & Executing Applications.

Stored Procedures/Functions: Stored procedures, How to create & execute procedures?, Where to store procedures?; Stored functions, How to create & execute functions?, Where to store functions? Where do procedures & functions reside?

Database Triggers: Use & type of database Triggers, Database Triggers Vs SQL*Forms, Database Triggers Vs. Declarative Integrity Constraints, BEFORE Vs. AFTER Trigger Combinations, Creating a Trigger, Dropping a Trigger.

Unit-III

Visual Basic

Introduction, Analyzing, Controls and Properties, Coding, Loops, Dialog Boxes, Additional Controls-Option Buttons, Frames, Check Boxes, Scroll Bars, Timer Control, Procedures and Functions, Using Debugging Windows, Database Programming, Crystal Reports. Simple Active X controls.

Suggested Readings:

1. Using Visual Basic 6 by Reselman & Other (Prentice-Hall of India)
2. Visual Basic 6 from Scratch by Donald & Oancea (Prentice-Hall of India)
3. Using Oracle-8 by Austin (Prentice-Hall of India)
4. Oracle 8 by Ivan Bayross (BPB Publication)
5. Special Edition Using Oracle 8/8i by Jr. Page (Prentice-Hall of India)
6. Teach Yourself More VB in 21 days by Days Maver (Techmedia)
7. Any other book/manual covering contents of this paper.

Note: Latest and good books may be added from time to time.

Paper-6.2: Software Engineering - 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.***

Unit-I

Software metrics: Need of software metrics and their benefits, size metrics, control complexity metrics, composite metrics, object-oriented metrics, and software quality metrics.

Software reliability: metric and specification, fault avoidance and tolerance, exception handling, defensive programming.

Unit-II

Software Testing: Testing fundamentals, objectives of software testing, white box and black box testing techniques, software testing strategies: unit testing, integration testing, validation testing, system testing, debugging.

Unit-III

Software maintenance: Aims of software maintenance, types of software maintenance, maintenance characteristics, maintainability, maintenance tasks, maintenance side effects.

CASE tools: Overview of CASE and types of CASE tools.

Suggested Readings:

1. Gill, Nasib S.: Software Engineering, Khanna Books Pub. Co.(P) Ltd, N. Delhi.
2. Singh, Rajender: Software Engineering, Excel Books, New Delhi.
3. Jalote, Pankaj: An Integrated Approach to Software Engineering, Narosa Publications, New Delhi.
4. Pressman : Software Engineering, TMH.
5. Ghezzi, Carlo : Fundaments of Software Engineering, PHI.
6. Fairley, R.E. : Software Engineering Concepts, McGraw-Hill.

Note : Latest and good books may be added from time to time.

Paper-6.3: Practical based on Paper-6.1

Max Marks : 60
Time Allowed: 4 Hrs

Note:

i) Practical : 45 Marks
(Application Development Using Oracle & Visual Basic)
ii) Viva-voce : 15 Marks