

SINGHANIA UNIVERSITY

Detailed Syllabus MCA

SYLLABUS & SCHEME

Subject Code	Subject Name	Sem.	Scheme			IA	ESE	Total Marks
			L	T	P			
MCA~101	Fundamental of I.T. & Digital Electronics	Sem 1	4			30	70	100
MCA~102	PC Package	Sem 1	3	1		30	70	100
MCA~103	Accounting with Tally	Sem 1	4			30	70	100
MCA~104	Operating System	Sem 1	4			30	70	100
MCA~105	Programming in C Language	Sem 1	4			30	70	100
MCA~106	LAB: PC Package, Corel & Photoshop	Sem 1			4	30	70	100
MCA~107	LAB: Accounting with Tally	Sem 1			4	30	70	100
MCA~108	LAB: Programming in C	Sem 1			4	30	70	100
	Total							800
MCA~201	Internet & Web Page Designing	Sem 2	3	1		30	70	100
MCA~202	Management Information System	Sem 2	4			30	70	100
MCA~203	OOP with C++	Sem 2	4			30	70	100
MCA~204	System Analysis & Design	Sem 2	4			30	70	100
MCA~205	VB.NET	Sem 2	4			30	70	100
MCA~206	LAB: Web Page Designing	Sem 2			4	30	70	100
MCA~207	LAB: OOP with C++	Sem 2			4	30	70	100
MCA~208	PROJECT in VB.NET/WPD	Sem 2			4	30	70	100
	Total							800
MCA~301	Data Structures & Algorithm	Sem 3	4			30	70	100
MCA~302	Programming with Java	Sem 3	4			30	70	100
MCA~303	ASP.NET through C#	Sem 3	4			30	70	100
MCA~304	Database Management System	Sem 3	4			30	70	100
MCA~305	Discrete Mathematics	Sem 3	4			30	70	100
MCA~306	LAB: Programming with Java	Sem 3			4	30	70	100
MCA~307	LAB: ASP.NET	Sem 3			4	30	70	100
MCA~308	LAB: Data Structure	Sem 3			4	30	70	100
	Total							800
MCA~401	Computer Networks	Sem 4	3	1		30	70	100
MCA~402	Computer Graphics	Sem 4	4			30	70	100
MCA~403	Software Engineering	Sem 4	4			30	70	100
MCA~404	RDBMS with Oracle/SQL	Sem 4	4			30	70	100
MCA~405	Server Administration with Linux & Windows	Sem 4	3	1		30	70	100
MCA~406	LAB: Networking	Sem 4		4		30	70	100
MCA~407	LAB: Oracle/SQL	Sem 4		4		30	70	100
MCA~408	LAB: Linux	Sem 4		4		30	70	100
	Total							800
MCA~501	Artificial Intelligence	Sem 5	4			30	70	100
MCA~502	Web Development with PHP	Sem 5	3	1		30	70	100
MCA~503A	Advance Java	Sem 5	4			30	70	100
MCA~503B	Android Programming	Sem 5	3	1		30	70	100
MCA~503C	Perl Programming	Sem 5	3	1		30	70	100
MCA~504A	E-Commerce	Sem 5	3	1		30	70	100
MCA~504B	Data Warehousing & Mining	Sem 5	4			30	70	100
MCA~504C	Software Project Management	Sem 5	4			30	70	100
MCA~505	LAB: PHP Lab	Sem 5		4		30	70	100
MCA~506	LAB: Adv.Java/Android Prog/Perl Prog	Sem 5		4		30	70	100

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Detailed Syllabus MCA

		Total							600
MCA~601	Advance Computer Architecture	Sem 6	4			30	70		100
MCA~602A	Advance Operating System	Sem 6	4			30	70		100
MCA~602B	Embedded System	Sem 6	4			30	70		100
MCA~602C	Big Data Analysis using Hadoop	Sem 6	3	1		30	70		100
MCA~603	MAJOR PROJECT	Sem 6	2	2	14	120	280		400
		Total							600
		GRAND TOTAL							4400

MCA – 1st Semester

MCA-101: Fundamental of I.T. & Digital Electronics

UNIT – 1

Computer Overview :

Computer Definition, Functionality of Computer, Advantage of Computer, Disadvantage of Computer.

Computer Applications :

Business, Banking, Insurance, Marketing, Healthcare, Engineering Design, Military, Communication, Government.

UNIT – 2

Computer Generations :

Generation & Description, Computer Types: PC, Workstation, Mini Computer, Mainframe & Super Computer.

Computer Components :

Input Unit, Output Unit, Memory & Storage Unit, Control Unit, Arithmetic logic Unit, Input Device- Keyboard, Mouse, Joystick, Light Pen, Track Ball, Scanner, Digitizer, Microphone, MICR, OCR, BCR, OMR & Output Devices- Monitors, Printers.

UNIT – 3

Computer Memory :

Cache Memory, Primary Memory, Second Memory, RAM & ROM, Computer Motherboard, Computer Memory Units, Computer Ports- Serial, Parallel, PS/2, USB, VGA, Ethernet Port etc. Computer Hardware.

Computer Software :

System Software, Application Software, Relationship between hardware & Software.

UNIT – 4

Number System :

Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, Decimal to Other Base System, Other Base System to Decimal System, Other Base to Non Decimal System, Shortcut Methods.

Data Communication, Information & Network:

What is Information, Data processing Cycle. Data Communication & Network.

UNIT – 5

Computer Networking :

Characteristics of Computer Network.

Operating System :

Objectives of OS, Characteristics of OS.

Computer Internet & Intranet

Internet, Similarities of Internet & Intranet, Differences of Internet & Intranet, How to Buy A Computer.

REFERENCE BOOK

- 1 *COMPUTER FUNDAMENTAL (PYAGYA PUBLICATION, MATHURA).*
- 2 *COMPUTER FUNDAMENTAL AND ORGANIZATION(B.RAM),NEW AGE INTERNATONAL PUBLISHER LTD.*
- 3 *RAJARAMAN V, "FUNDAMENTALS OF COMPUTERS", PHI*

MCA-102: PC PACKAGE

UNIT-I:

Introduction to MS-Word, Parts of MS-Word Windows (Title Bar, Menu Bar, Tool Bar, Ruler, Status Area) Creating New Documents, Opening an existing Documents, Find and Replacing, Moving and Copying Text, Page Set-up, Margins and Gutters, Creating a document using Templates and Wizards.
Text Formatting-Changing Fonts and Font size, Make Text Bold, Italic and Under line, Spacing, Centre, Right and Left alignment, Page Breaks, Headers and Footers, Saving Documents.

UNIT-II:

Spell Checking, Printing, Creating a table using table Menu-Entering and Editing text, Selecting, Adding and Deleting Rows and Columns, Changing and Shading Template and Wizard, Working with Graphics, Drawing objects, Using frames to position objects, Mail Merge.

UNIT-III:

Introduction to MS-Excel, Creating a simple worksheet, Entering data into worksheet, Computations in Worksheets, Printing the Worksheet, Creating Graphs and Charts, What if analysis (Data Sort, Fill, Query, Filter), Copying, Renaming, Moving, Adding and Deleting, Worksheet.

Using Formulas and Functions-Formula, Characteristics of formula, Entering formula, Copying formulas, Types of functions (date, Mathematical, Logical, Statistical), Function Wizard, Formatting of using Auto format.

UNIT-IV:

Introduction to MS-PowerPoint, PowerPoint elements, Templates, Wizards, Views and Color Schemes, Exploring PowerPoint menu, Adding text, Adding title, Adding text area, Resizing text boxes, Adding art, Starting a New Slide, Slide Transition Effects and other Animation Effects, Starting a Slide Show, Saving Presentation, Printing Slide, Display of Slide Show.

UNIT-V:

Introduction to Databases, Starting Access 2007 Getting Started Page and Opening a Database, Understanding the Access Program Screen, Understanding the Ribbon, Using the Office Button and Quick Access Toolbar, Creating a New Database, Creating a Table, Modifying a Table, Creating a Query, Sorting a Query, Using AND and OR Operators in a Query

REFERENCE BOOK

- 1 RAVINDRA SHARMA (ASIAN PUBLICATION)
- 2 PRYAGYA PUBLICATION (MATHURA)
- 3 MICROSOFT OFFICE (VISHNU PRIYA SINGH)

MCA-103: ACCOUNTING WITH TALLY

UNIT-I TALLY FUNDAMENTALS

Basic Concepts of Accounting, Financial Statements, Financial Statement Analysis, Cost Centre, Basic concepts of Inventory. 2. Tally Configuration & INI setup, Data Directory & Folders configuration, Single & Multiple User, Tally Screen Components, Mouse / Keyboard Conventions & Key, Combinations, Switching between screen areas, Quitting Tally. Maintaining Company Data, Basic Company Details, Create/Alter/Select/Load/Close a Company, Chart of Accounts, Company Features, and Configuration.

UNIT-II BASIC ACCOUNTING:

Create, Alter & Display Groups and Ledgers, All accounting voucher types, Accounting Voucher transactions, Account Invoice transactions, Excise Invoice, Export Invoice, Transactions using Bill-wise details, Bank Reconciliation, Interest calculations using simple & advance parameters, Interest calculations on outstanding balances & on invoices, Use of voucher class, adjustment of interest, Creation of voucher class, Invoice entry in a class situation, Create, Alter & Delete Budgets for groups, ledgers & cost centre, Defining credit limit & credit period, Display Budgets & variances, Create, Alter & Delete a scenario. Journal Transactions, payment voucher, Godown summary .

UNIT - III ACCOUNTING REPORTS AND BOOKS OF ACCOUNTS

Reports like balance sheet, Profit & Loss account, Ratio analysis Trial Balance.

Accounts books like cash / bank book, All Ledgers Group summary & vouchers, Sales, purchase & journal registers, Cost centre & category summary, Cost centre breakup ledger & group breakup, outstanding receivables & payables, interest receivable & payable, Statistics, Cash & Fund flow, Day book List of Accounts, Reversing journals, optional vouchers, post-dated vouchers .

UNIT - IV INVENTORY ACCOUNTING AND INVENTORY REPORTS

Create, Alter & Display Stock Groups and Stock Items, All inventory voucher types and transactions Inventory details in accounting vouchers, Reports like Stock summary, Inventory books like Stock item, Group summary, Stock transfers, Physical stock register, Movement analysis, Stock group & item analysis, stock category analysis Ageing analysis, Sales order & Purchase order book, Statement of inventory related to Godowns, categories, stock query, Reorder status, Purchase & Sales order summary, Purchase & Sales bill pending, Exception reports like negative stock & ledger, overdue receivables & payables, memorandum vouchers, optional vouchers, post-dated vouchers, reversing journals.

UNIT – V PRINTING, HOUSEKEEPING AND ADMINISTRATION

Cheque Printing, Common printing options, Different printing formats, Multi-Account printing, Dynamic- Report specific options, Creating Group Company, Use of Tally vault, Using Security control & defining different security levels, Use of Tally Audi,. Back-up & Restore, Splitting company data, Export & import of Data, ODBC compliance, use of E-mail, Internet publishing, Upload, web browser & online help, Re-write data.

REFERENCE BOOK

- 1 *PRYAGYA PUBLICATION (MATHURA)*
- 2 *Computerised Accounting Using Tally.ERP 9*
By : Tally Education Private Limited
- 3 *Computerised Accounting tally (BY : Vikas Gupta)*

MCA-104: OPERATING SYSTEM

UNIT – 1

Operating System Concepts:

Feature of OS, Objectives & Characteristics of OS, History , Type of OS, Booting , Cold Reboot, Input/ Output System, Dos & Disks, Important Terms- Dos Prompt, Command, Compiler, FAT, Interface, Logged Disk, Error Massage, Bios, Sectors, Chache, Conventional Memory, Cluster.

UNIT – 2

Internal Commands in MS-DOS:

Internal Commands- Date, Time, Ver, Vol, Cls, Prompt, Dir, CD, MD, RD, Path, Copy, Copy Con, Del, REN.

UNIT – 3

External Commands in MS-DOS:

FORMAT, LABEL, CHKDSK, DISKCOPY, UNFORMAT, UNDELETE, SYS, TREE, DELTREE, MOVE, MORE, BACKUP, RESTORE, ATTRIB, XCOPY, MODE, DEFRAG, Batch File.

UNIT – 4

Introduction to Window 7:

Windows Features- Desktop, Icon, Dialogue Box, Start Menu, Taskbar, Start Up & Shut Down, Manipulating Windows- Maximize, Minimize, Resize, Close, Saving, Deleting File, Create Folder, Help, Setting, Search, Windows Keyboard Shortcuts, Right Click Menu.

UNIT – 5

Linux Operating System :

What is Linux, Kernal, Shell, File System Hierarchy Standard, Linux Basic Commands- pwd, ls, cd, mkdir, rm, touch, man, cp, mv, locate, echo, cat, vi, sudo, df, du, tar, zip, uname, apt-get, chmod, ping Etc.

TEXT & REFERENCE BOOKS:

- 1 *DOS QUICK REFERENCE BY RAJEEV MATHUR, GALGOTIA PUBLICATIONS LINUX*
- 2 *COMPLETE BY BPB PUBLICATIONS*
- 3 *PETER NORTON COMPLETE GUIDE TO LINUX BY PETER NORTON, TECHMEDIA PUBLICATIONS*
- 4 *LEVEL MODULE M 1.1 INFORMATION TECHNOLOGY BY KHANNA BOOK PUBLICATIONS, NEW DELHI*
- 5 *WINDOWS XP COMPLETE REFERENCE, BPB PUBLICATION*

MCA-105: Programming in C Language

Chapter – 1

Basic of C Language:

Overview of C, Features of C , My First C Program, Compile and Run C program, C syntax Rules, Keyword and identifier.

Chapter – 2

Operator and Data type in C:

Operator in C Language: arithmetic, Relational, Logical & Bitwise operator, Data type in C.

UNIT - 2

Chapter – 3

Variables in C :

Variable in C, Data type of Variable, Declaring, Defining and Initializing a variable, Difference between Variable and identifier, C input & output, Decision making in C.

Chapter – 4

Switch Statement & Looping in C :

Switch Statement in C, How to use Loops in C, Types of Loops.

UNIT - 3

Chapter – 5

Arrays & Storage Classes :

Arrays in C, Two dimensional Arrays, String & Character Arrays, String Handling Functions, Storage Classes in C, External & Global Variable, Static Variables, Register Variable.

Chapter – 6

Functions in C :

Functions in C, Use of Functions, Passing Arguments to a Functions, Type of user defined Functions, Nesting of Functions, Recursion, Call of Function, Pass Array to a Function.

UNIT - 4

Chapter – 7

Structures & Unions in C :

Structure, Declaring Structure Variables, Arrays of Structure, Nested Structures, typedef in C, Union in C language.

Chapter – 8

Pointers in C :

Introduction to Pointers, Concept, Benefit of Pointers, Declaring & Initializing and using a pointer of Variable.

UNIT - 5

Chapter – 9

File Input/Output in C :

File Input/Output in C, Creating or Opening a file, Closing a file, Difference between Append & Write Mode.

Chapter – 10

Dynamic Memory Allocation in C :

Memory allocation process, Allocating block of Memory, Command Line Argument in C.

REFERENCE BOOK

- 1 THE COMPLETE REFERENCE WITH C (HERBERT SCHILDT)
- 2 LET US C by Yashwant Kanetkar
- 3 PROGRAMMING IN C (E. BALAGURUSWAMY)
- 4 PRYAGYA PUBLICATION (MATHURA)

MCA-106: LAB: Corel & Photoshop and based on MCA-102

UNIT - I

D.T.P For Publications: Introductions to Printing, Types of Printing, Offset Printing, Working of offset Printing, Transparent Printout, Negative & Positives for Plate were making, Use of Desk Top Publishing in Publications, Importance of D.T.P in Publication, Advantage of D.T.P in Publication, Mixing of graphics & Image in a single page production, Laser printers - Use, Types, Advantage of lager printer in publication.

UNIT - II

Introduction to Tools of CorelDraw, Managing Palettes ,Working with Images, Patterns and Textures, ,Working with Shapes, Colours and Fills ,Image Rasterisation and Editing, Transformation Menu.

UNIT - III

Coreldraw Page Setup and Designing, Using Styles and Templates, Working with Text, Formatting Text, Text Attributes. Designing Different Page Layouts, Column Layout, Working with Layers., Special Effect to Objects and Texts, Contour Tool, Layout for News Paper and Magazines. Preparation of Visiting Cards & Invitation Cards, & Logo Design,

UNIT - IV

Introduction to Adobe Photoshop & Documents ,Various Graphic Files and Extensions Vector Image and Raster Images, Various Colour Modes and Models.

UNIT - V

Introduction to Screen and Work Area, Photoshop Tools & Palettes ,Use of Layers & Filters Working with Images.

REFERENCE BOOK

- 1 BPB DTP COURSE (SATIS JAIN)
- 2 PRYAGA PBUBLICATION (MATHURA)
- 3 SMART DTP COURSE (SAUMYA RAJAN BEHRA)
- 4 CORELDRAW X4 FOR SIMPLE STEPS

MCA-201: INTERNET AND WEB PAGE DESIGN

UNIT – 1

Overview of Internet :

What is Internet, Internet Evolution, Advantage & Disadvantage of Internet, Extra Net, Reference Models, Layers, TCP/ IP Model, Domain name system Architecture, DNS Working.

UNIT – 2

Internet Services & Protocols :

Communication Services, Web Services, World Wide Web, Video Conferencing, Internet Protocols, TCP, IP, UDP, FTP, HTTP, Email, IMAP, POP, Email Working, E-mail Security.

UNIT – 3

Web Designing Concepts & Hosting :

Wireframe, Web Designing Tools, Web Development Process, Websites Hosting, Types of Hosting, Web sites Security, World Wide Web Evolution & Architecture, Web Browsers, Web Server, Proxy Server, Search Engines, Usenet, Digital Signature, Firewall Security.

UNIT – 4

HTML – Overview :

HTML Document Structure, Basic Tags- Heading Paragraph, Line Break, Center Etc, HTML Elements, HTML Attributes.

UNIT – 5

HTML Formatting :

Type Style, Meta Tags, Comments, Images, Tables, Text Links, HTML Fonts etc.

REFERENCE BOOK

1 *PRYAGYA PUBLICATION : MATHURA*

MCA-202: Management Information System

UNIT-I

Introduction to MIS: Meaning and role of MIS, Definition of MIS, Systems approach to MIS, MIS organization within a company. Concept of balanced MIS , effectiveness and efficiency criteria.

UNIT –II

MIS Planning: MIS structure and components, MIS features, Problem and Derivation of MIS plans, Prioritization and developmental strategies.

UNIT-III

Conceptual Design of MIS: Definition of the problem, System objectives and system constraints. Analysis of information Source, alternative system design and selection of optimal system. Conceptual system de- sign document.

UNIT - IV

Detailed System Design and Implementation: Application of basic system design concepts to MIS, Involvement of end-user and role of MIS department and System Analyst, Role of Top Management during design and implementation. System evaluation review and update. Management and control of MIS function. Advanced MIS concept, Decision Support System. Pitfalls in MIS development. .

UNIT-V

MIS for Accounting and Finance Function, MIS for Personnel Systems, MIS for Accounting and Finance Function, MIS for Personnel Systems, for Marketing Systems, Production & Inventory system.

Books:

1. Murdick R. G., Ross JE. & Claggett J.R. : Information system for Modern Management, 3rd Edn., PHI, 1997.
2. James A.O Brien: Management Information Systems, Galgotia Pubn., 1994.
3. Wigarders K, Svensson A., Sehong L. : Structured Analysis & Design of Information Systems, Mcgraw-Hill book Co. 1986.
4. Locus: Analysis, Design and Implementation of Information system, 3rd Edn., McGraw-Hill Book Co.
5. Jawedker: Information System for Management.

MCA-203: OOP WITH C++

UNIT-I

Overview of C++ : Object oriented programming, Concepts, Advantages, Usage. C++ Environment: Program development environment, the language and the C++ language standards. Introduction to various C++ compilers, C++ standard libraries, Prototype of main() function, Data types. C++ as a superset of C, New style comments, main function in C++, meaning of empty argument list, function prototyping, default arguments and argument matching. User defined data types: enumerated types, use of tag names, anonymous unions, scope of tag names Classes & Objects : Classes, Structure & Classes, Union & Classes, Inline Function, Scope Resolution operator, Static Class Members: Static Data Member, Static Member Function, Passing Objects to Function, Returning Objects, Object Assignment. Friend Function, Friend Classes.

UNIT-II

Array, Pointers References & The Dynamic Allocation Operators: Array of Objects, Pointers to Object, Type Checking C++ Pointers, The This Pointer, Pointer to Derived Types, Pointer to Class Members, References: Reference Parameter, call by reference and return by reference Passing References to Objects, Returning Reference, Independent Reference, C++'S Dynamic Allocation Operators, Initializing Allocated Memory, Allocating Array, Allocating Objects. Constructor & Destructor : Introduction, Constructor, access specifiers for constructors, and instantiation, Parameterized Constructor, Multiple Constructor in A Class, Constructor with Default Argument, Copy Constructor, Destructor.

UNIT-III

Overloading as polymorphism: Function & Operator Overloading : Function Overloading, Overloading Constructor Function Finding the Address of an Overloaded Function, Operator Overloading: Creating A Member Operator Function, Creating Prefix & Postfix Forms of the Increment & Decrement Operation, Overloading The Shorthand Operation (I.E. +=,-= Etc), Operator Overloading Restrictions, Operator Overloading Using Friend Function, Overloading New & Delete, Overloading Some Special Operators, Overloading [], (), -, Comma Operator, Overloading << And . Namespaces: global namespace and namespace std, nested namespaces.

UNIT-IV

Inheritance : Base Class Access Control, C, Protected Base Class Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors & Inheritance, When Constructor & Destructor Function are Executed, Passing Parameters to Base Class Constructors, Granting Access, Virtual Base Classes. Virtual Functions & Polymorphism : Virtual Function, Pure Virtual Functions, Early Vs. Late Binding.

UNIT-V

Exception Handling, Exception handling in C++, try, throw, catch sequence, multiple catch blocks, uncaught exceptions, catch-all exception handler, The C++ I/O System Basics : C++ Streams, The Basic Stream Classes C++ Predefined Streams, Formatted I/O: Formatting Using The ios Members, Setting The Formal Flags, Clearing Format Flags, An Overloaded Form Of Setf (), Using Width() Precision() and Fill(), Using Manipulators to Format I/O, Creating Your own Manipulators.

TEXT & REFERENCE BOOKS:

- *HERBERT SCHILDT, "C++ THE COMPLETE REFERENCE " - TMH PUBLICATION ISBN 0-07-463880-7*
- *E. BALGURUSWAMY, "C++ " , TMH PUBLICATION ISBN 0-07-462038-X*
- *M KUMAR "PROGRAMMING IN C++", TMH PUBLICATIONS*

MCA-204: System Analysis & Design

UNIT-1

1. SYSTEMS ANALYSIS AND DESIGN — OVERVIEW

Systems Analysis, Systems Design, What is a System?, Elements of a System, Types of Systems, Systems Models, Categories of Information.

2. SYSTEM DEVELOPMENT LIFE CYCLE

Phases of SDLC, Life Cycle of System Analysis and Design, Role of System Analyst, Attributes of a Systems Analyst

UNIT-2

3. SYSTEM PLANNING

What is Requirements Determination?, Major Activities in requirement Determination, Information Gathering Techniques, Feasibility Study, Steps Involved in Feasibility Analysis, Types of Feasibilities

4. STRUCTURED ANALYSIS

What is Structured Analysis?, Structured Analysis Tools, Data Flow Diagrams (DFD) or Bubble Chart, Data Dictionary, Decision Trees, Decision Tables, Structured English, Pseudocode, Guidelines for Selecting Appropriate Tools.

UNIT-3

5. SYSTEM DESIGN

Inputs to System Design, Outputs for System Design, Types of System Design, File Organization, File Access, Documentation Control, Types of Documentations, User Documentation, System Documentation

6. DESIGN STRATEGIES

Top-Down Strategy, Bottom-Up Strategy, Structured Design, Factors Affecting System Complexity

UNIT-4

7. INPUT / OUTPUT & FORMS DESIGN

Input Design, Output Design, Forms Design

8. TESTING AND QUALITY ASSURANCE

Testing, Types of Testing, Rules for System Testing, Quality Assurance

UNIT-5

9. SYSTEM IMPLEMENTATION AND MAINTENANCE

Training, Training Methods, Conversion, System Maintenance / Enhancement

10. SYSTEM SECURITY AND AUDIT

System Audit, Audit of Computer System Usage, Audit Trial, Audit Methods, Audit Considerations, Security, Control Measures, Risk Analysis

TEXT & REFERENCE BOOKS:

- *SYSTEM ANALYSIS & DESIGN BY V K JAM, DREAMTECH PRESS*
- *MODERN SYSTEM ANALYSIS & DESIGN BY A HOFFER, F GEORGE, S VALACIAH LOW PRICED EDN. PEARSON EDUCATION.*
- *INFORMATION T ECHNOLOGY & COMPUTER APPLICATIONS BY VK.KAPOOR SULTAN CHAND & SONS, NEW DELHI.*

MCA-205: VB.NET

UNIT-I

Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies: types of assemblies, class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Project Explorer, Toolbox, Properties Window, form designer, form layout, immediate window. Event driven Programming - Methods and events related with mouse and keyboard.

UNIT-II

The VB.NET Language- Console Programming, Declaring variables, Data Types, Scope & lifetime of a variable, Arrays, types of array, control array

Subroutine, Functions, Passing argument to functions, Optional Argument, Returning value from function.

Control flow statements: Decisions and Conditional statement, Loop statement. Exceptions

Working with Forms: Creating Forms, Building User Interface Web Forms, Loading, showing and hiding forms, working with multiple forms, controlling One form within another.

UNIT – III

GUI Programming with windows form: VB.Net Controls, Text box control, label control, button control, Listbox, Combo box, checked box, Picture box, Radio button, Panel, scroll bar, Timer control, there Properties, Methods and events, adding controls at runtime.

Dialog Boxes - Common dialog control: File, save, Print, Help.

Designing menus : Creating Menu and Menu Items, access & shortcut keys.

MDI forms : Properties of Parent & child form, working with parent and child menus.

UNIT-IV

Object oriented Programming: Classes & Namespaces, objects, data members, Properties, Methods, raising and handling Events, constructors. Inheritance, Access Specifiers: Public Private, Protected, overloading, overriding, Creating Interfaces, multiple interfaces, My Base & My Class keywords.

Concept of OLE, The COM technology, Advantages of COM+, COM & .NET, Create User control, register user control, access com component in .net application.

Deployment of .NET application.

UNIT-V

Accessing Database with ADO.NET (visually): Create connection with sever explorer, Creating data connection using data Connection, Command, Adapter, Dataset and DataReader controls.

Data binding with data grid and basic controls. The Data Form wizard.

Accessing Database using ADO.NET Object model (through code): create Connection object, Command object, DataAdapter object, DataSet object. Add, delete, move & update records to dataset. Executing SQL query, operation on data rows and columns.

TEXT & REFERENCE BOOKS:

- *VB.NET PROGRAMMING BLACK BOOK BY STEVEN HOLZNER –DREAMTECH PUBLICATIONS*
- *MASTERING VB.NET BY EVANGELOS PETROUTSOS- BPB PUBLICATIONS*
- *INTRODUCTION TO .NET FRAMEWORK-WORX PUBLICATION*
- *MSDN.MICROSOFT.COM/NET/*
- *WWW.GOTDOTNET.COM*

MCA-301: Data Structures & Algorithm

UNIT-1

Introduction to Data Structure, What is an algorithm, Time complexity of Algorithm.

UNIT-2

Introduction to Sorting, Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort, Heap Sort, Searching Algorithms on Array, Binary Search.

UNIT-3

Stacks, Basic feature of stacks, Applications of Stack, Implementation of stack, Algorithm for PUSH operation, POP operation, Top operation, Search operation, Que Data Structure, DEQUEUE operation, Queue Data structure using stacks.

UNIT-4

Introduction to Linked Lists, Advantages and Disadvantages of Linked List, Types of Linked Lists, Linear Linked List, Circular Linked List, Implementing Circular Linked List.

UNIT-5

Graph & Tree algorithms, Graphs, Trees, DAG vs Tree, Binary Tree, Data Structure representation, Searching Algorithm, Breath First Search (BSF) and its implementation, Depth First Search (DFS) and its implementation.

TEXT & REFERENCE BOOKS:

- *FUNDAMENTALS OF DATA STRUCTURE, BY S. SAWHNEY & E. HOROWITZ*
- *DATA STRUCTURE: BY T REMBLEY & SORRENSON*
- *DATA STRUCTURE: BY LIPSCHUISTS (SCHAUM 'S OUTLINE SERIES MCGRAW HILL PUBLICATION)*
- *FUNDAMENTALS OF COMPUTER ALGORITHM: BY ELLIS HOROWITZ AND SARTAJ SAWHNEY*

MCA-302: Programming with Java

UNIT-I

History and design features of JAVA, how java works, basics of JAVA, Applications and Applets, using the tools in JDK, javadoc, java, jdb etc. Applet Programming - Creating and executing Java applets, inserting applets in a web page, Java security. JAVA Language- Keywords, Constants, Variables, and Data Types. Operators and Expressions, Decision making, Branching and Looping, Labeled Loops Statement, Jump statements: Break, Continue, and Return. Arrays and Strings-Creating an Arrays, one and two Dimension Arrays, String Array, String and String Buffer Classes.

UNIT-II

Classes, Objects and Methods Defining a class, adding variables and Methods, creating objects constructors, Wrapper Classes. Inheritance, Basics types, using super, multi level hierarchy, abstract and final classes, object class, packages and interfaces, Access protection, Extending interfaces, packages.

UNIT-III

Multithreading Fundamentals, Java Thread model : priorities, synchronization, messaging, thread class, Runnable interface, Interthread communication, suspending, resuming and stopping threads.

UNIT-IV

Exception Handling, Fundamentals exception types, uncaught exceptions, throws, throw, try -catch, final, built in exceptions, creating your own exceptions.

Input/Output -Basics, Streams, Byte and Character streams, predefined streams, reading and writing from console and files .Using standard Java Packages (lang,util,io)

UNIT-V

Packages ; Fundamental of Packages, Usage of Packages, Applets and Appletviewer . Life cycle of an Applet.

TEXT & REFERENCE BOOKS :

- *JAVA THE COMPLETE REFERENCE BY PATRICK NAUGHTON AND HERBERT SCHILDT. TMH PUBLICATION ISBN 0-07-463769-X*
- *PROGRAMMING WITH JAVA BY E. BALAGURUSWAMY TMH PUBLICATIONS ISBN 0-07-463542-5*
- *USING JAVA 1.2 BY JOSEPH WEBER. PHI – ISBN-81-203-1558-8*

MCA-303: ASP.NET through C#

UNIT I

HTML - Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Sections, Building HTML documents, Inserting texts, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML tags, Table layout and presentation, Use of front size & Attributes. List types and its tags, Use of Frames and Forms in web pages, ASP & HTML Forms.

UNIT II

Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program, Language features: Type system, boxing and unboxing, flow controls, classes, interfaces, Serialization and Persistence, Serializing an Object, Deserializing an Object. Delegates and Reflection.

UNIT III

Overview of Dynamic Web page, introduction & features of ASP.NET, Understanding ASP.NET Controls, Applications, Web servers, installation of IIS, Web forms, web form controls -server controls, client controls, Adding controls to a web form, Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project, Form Validation: Client side validation, server Side validation, Validation Controls : Required Field Comparison Range. Calendar control, Ad rotator Control.

UNIT IV

Overview of ADO.NET, from ADO to ADO.NET. ADO.NET architecture, Accessing Data using Data Adapters and Datasets, using Command & Data Reader, binding data to data bind Controls,

Displaying data in data grid, XML in .NET , XML basics, attributes, fundamental XML classes: Document, textwriter, textreader.

UNIT-V

Web services: Introduction, State management- View state, Session state, Application state, SOAP, web service description language, building & consuming a web service, Web Application deployment. Caching, Threading Concepts, Creating Threads in .NET, managing threads, Thread Synchronization

TEXT & REFERENCE BOOKS:

- *ASP.NET 3.5 BLACK BOOK (COVERS C# AND VB 2008 CODES) - DREAMTECH PUBLICATION*
- *THE COMPLETE REFERENCE ASP.NET BY MATHEW MACDONALD - TMH*
- *PROFESSIONAL ASP.NET- WROX PUBLICATION*
- *INTRODUCTION TO .NET FRAMEWORK-WORX PUBLICATION*

MCA-304: Database Management System

UNIT – 1

Overview of Database, Components of database, Functions & advantage of DBMS, Database Architecture, Database Model, Codd's Rule, RDBMS Concepts, Database Keys.

UNIT – 2

Normalisation of Database, E-R Diagram, Components of E-R Diagram, Entity, Attribute, Relationship, Binary Relationship, Recursive Relationship, Generalization, Specialization, Aggregation.

UNIT – 3

Introduction to SQL, SQL Commands, DDL commands: create, alter, truncate, drop, rename, DML commands: insert, update, delete, merge,

UNIT – 4

TCL commands: commit, rollback, savepoint, DCL commands: grant, revoke, DQL commands: select

UNIT – 5

Division Operator in SQL

UNIT – 6

Advance SQL

TEXT & REFERENCE BOOKS:

- SILBERSCHATZ KORTH AND SUDARSHAN-DATABASE SYSTEM CONCEPTS, 6TH ED. TATA MC-GRAW HILL.
- RAGHU RAMA KRISHNAN-DATABASE MANAGEMENT SYSTEMS, 2ND ED. TATA MC-GRAW HILL
- RAJESH NARANG – DATABASE MANAGEMENT SYSTEM, 2ND ED. PHI
- R. ELMASRI ET. AL "FUNDAMENTALS OF DATABASE SYSTEMS". 3RD EDITION – ADDISON WESLEY, (INDIAN REPRINT), NEW DELHI.
- C.J.DATE, DATA BASE SYSTEMS, Vol I & II

MCA-305: Discrete Mathematics

UNIT-1 : SETS & RELATIONS

1. **Discrete Mathematics – Introduction**
2. **Sets** : Set – Definition, Representation of a Set, Cardinality of a Set, Types of Sets, Venn Diagrams, Set Operations, Power Set, Partitioning of a Set
3. **Relations**: Definition and Properties, Domain and Range, Representation of Relations using Graph, Types of Relations

UNIT-2 : MATHEMATICAL LOGIC

4. **Propositional Logic**: Definition, Connectives, Tautologies, Contradictions, Contingency, Propositional Equivalences, Inverse, Converse, and Contra-positive, Duality Principle, Normal Forms
5. **Predicate Logic** : Definition, Well Formed Formula, Quantifiers, Nested Quantifiers
6. **Rules of Inference**: What are Rules of Inference for?, Table of Rules of Inference, Addition, Conjunction, Simplification, Modus Ponens, Modus Tollens, Disjunctive Syllogism, Hypothetical Syllogism, Constructive Dilemma, Destructive Dilemma

UNIT-3 : GROUP THEORY AND PROBABILITY

7. **Operators and Postulates**: Closure, Associative Laws, Commutative Laws, Distributive Laws, Identity Element, Inverse, De Morgan's Law
8. **Probability** : Basic Concepts, Probability Axioms, Properties of Probability, Conditional Probability, Bayes' Theorem

UNIT-4 : MATHEMATICAL INDUCTION & DISCRETE STRUCTURE

9. **Mathematical Induction**: Definition, Strong Induction
10. **Spanning Trees**: Minimum Spanning Tree, Kruskal's Algorithm, Prim's Algorithm

UNIT-5 : BOOLEAN ALGEBRA

11. **Boolean Expressions and Functions** : Boolean Functions, Boolean Expressions, Boolean Identities, Canonical Forms, Logic Gates.
12. **Simplification of Boolean Functions**: Simplification Using Algebraic Functions, Karnaugh Maps, Simplification Using K- map.

Text/References:

1. Kenneth H. Rosen, "Discrete Mathematics and Its Applications", TMH
2. C.L. Liu, "Elements of Discrete Mathematics", TMH.
3. Kolman, Busby & Ross, "Discrete Mathematical Structures", PHI.
4. Narsingh Deo, "Graph Theory With Application to Engineering and Computer Science", PHI
5. Trembly J.P. & Manohar P., "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill..

MCA-401: Computer Networks

UNIT-I

Use of communication and IT , Communication Mode- Simplex, Half Duplex, Full Duplex, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Types of Network - LAN, WAN, MAN ,Internet etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, World Wide Web Internet Services, Analog & Digital Signal.

UNIT-II

Base Band , Broad Band, Multiplexer FDM, TDM, Modulation AM, FM, PM, Transmission Media ,Modem. OSI Reference Model, Switching Technique, Message Switching, Circuit Switching, Packet Switching, Virtual Circuit, , IEEE Standards, 802.3, 802.4, 802.5.

UNIT-III

Fast Ethernet, FDDI Token Ring, Wireless LAN, Inter-Networking Devices, Bridge, Routers Gateways, Repeater, Routing Algorithms, Distance Vector Routing, Shortest Path Routing, Broadcast Routing, Multicast Routing, TCP/IP Protocol, IPV4 Addressing, Congestion Control, Traffic Shaping.

UNIT-IV

Comparison Between OSI and TCP/IP Models, TELNET, FTP, SMTP, MINE, UDP, URL (Uniform Resource Locater) HTTP , ISDN Channel, ISDN Services, Base Band ISDN, Broadband ISDN.

UNIT-V

Network Security : Network Security Issues, Firewalls – Need and Features of Firewalls, Types of Firewall Technology- Network Level and Application Level, IP Packets Filter Screening Routers, Limitations of Firewalls.

TEXT & REFERENCE BOOKS :

- *COMPUTER NETWORKING BY ANDREWS TANANBAUM*
- *UNDERSTANDING DATA COMMUNICATION OF NETWORKING BY WILLIAM A SHAY*
- *COMMUNICATION AND NETWORK BY LEWIS MACHENZIE*
- *DATA COMMUNICATION BY PRAKASH C GPTA*
- *DATA AND COMPUTER COMMUNICATION: BY WILLIAM STALLINGS*

MCA-402: Computer Graphics

UNIT-I

Introduction: Elements of graphics workstation. Video Display Devices. Raster Scan Systems. Random Scan systems. Input devices. Graphics Software Coordinate Representations, Fundamental Problems in Geometry.

UNIT-II

Algorithms: Line drawing algorithms- DDA Algorithm. Bresenham's Line Algorithm. Frame buffers. Circle and Eclipse generating algorithms. Midpoint Circle Algorithm. Scan-line polygon fill algorithm. Inside-Outside tests. Scan- Line fill of curved Boundary Areas. Boundary fill Algorithm. Flood fill Algorithm. Character generation. Attributes of lines, curves, filling, characters. etc.

UNIT-III

Graphics Primitives: Primitive Operations, The display file interpreter-Normalized Device Coordinates. Display- File structure. Display – file algorithm. Display control and Polygons- polygon representation. Attributes of output primitives: Line attributes - Line type. Line width. Pen and Brush options. Line Color. Color and gray scale levels. Color-tables

UNIT-IV

Gray scale. Area- Fill Attributes- Fill styles. Pattern fill. Soft fill. Character Attributes. Text attributes. Geometric Transformations: Matrices. Scaling Transformations. Sin and Cos Rotation. Homogeneous Co-ordinates and Translation. Co-ordinate Translations. Rotation about an arbitrary point. Inverse Transformations, Transformations Routines.

2-D Viewing- The viewing pipeline. Viewing co-ordinate, Reference Frame. Windows to view ports . co-ordinate transformation 2-D Viewing functions. Clipping operations point clipping. Line clipping. Cohen- Sutherland. Line Clipping. Polygon clipping. Sutherland Hodge man clipping.

UNIT-V

3-D concepts. Three dimensional Display Methods Parallel projection. Perspective projection. Visible line and surface identification. Surface rendering. Three Dimensional Object representations. Bezier curves and surfaces. B-Spline curves and surfaces. Visibility , Image and object precision Z- buffer algorithm. Floating horizons. Computer Animation: Design of Animation Sequences. General Computer Animation Functions-Raster Animations. Key Frame Systems. Morphing Simulating Accelerations. Motion Specifications. Kinematics and Dynamics.

Text/References:

1. J. Foley, A. Van Dam, S. Feiner, J. Hughes: Computer Graphics- Principles and Practice, Pearson
2. Hearn and Baker: Computer Graphics, PHI.

MCA-403: Software Engineering

UNIT - I

Software : Software Characteristics and Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & RAD Model, Incremental Model and Spiral Model. Project Metrics : Software Measurement–Size Oriented, Function Oriented Metrics, Extended Function Point Metrics.

UNIT - II

Software Project Planning: Objectives, Decomposition Techniques, and Empirical Estimation Models. Analysis Concept and Principles: Requirement Analysis, Analysis Principles.

UNIT – III

Design Concepts and Principles: Design Process, Design Concepts, Design Principles, Effective Modular Design, Human Computer Interface Design, Interface Design Guidelines.

UNIT - IV

S/W Quality Assurance : Quality Concepts, Reliability S/W Testing Models : S/W Testing Fundamentals, White and Black Box Testing, Basic Path Testing, Testing Strategies : Strategic Approach to S/W Testing, Unit Testing, Integration Testing, Validation Testing, System Testing,

UNIT - V

S/W Reuse : Reuse Process, Classification and Retrieving Components, Economics of S/W Reuse ,CASE : Introducing to CASE, Taxonomy of Case Tools,

TEXT & REFERENCE BOOKS :

- *SOFTWARE ENGINEERING BY R.S.PRESSMAN*
- *AN INTEGRATED APPROACH TO SOFTWARE ENGINEERING BY PANKAJ JALOTE*

MCA-404: RDBMS

Unit-I

Introduction to Databases and Transactions. What is database system, purpose of database system, view of data, relational databases, database architecture, transaction management. Data Models The importance of data models, The evolution of data models, Degrees of data abstraction.

Unit-II

Structure of Relational Database Database Schema, Key, Relational Operations Formal Relational Query Languages .
ORACLE : Oracle product details, Overview of oracle architecture Oracle files, System and User process, Oracle Memory, System data base object, Oracle Data types. Working with Tables. Data Constraints, Select Command, Oracle Operator, Range Searching, Pattern Matching, Oracle Built In Function Grouping data from Tables in SQL, Manipulation Data in SQL, Joining Multiple Tables ,Sub queries,

Unit-III

Oracle Security –Privileges, Creating view, Granting Permissions, - Updating, Selection, Destroying view Creating Indexes. Creating and Managing, Working with Sequences.

Unit-IV

PL/SQL Introduction, Data type support in PL/SQL, Conditional Statements, Using DML Within PL/SQL, Procedures & Functions, Cursors, Parameterized Cursor.

Unit-V

Exception handling in PL/SQL, Triggers - Concept, use, how to apply database triggers, type of triggers, Syntax, deleting.

REFERENCE BOOK

- 1** *Database Design and Implementation*
 Author(s) Howard Gould
 Publisher: bookboon.com (2015)
- 2** *RDBMS (PRYAGYA PUBLICATON , MATHURA)*
- 3** *ORACLE DATABSE, THE COMPLETE REFERENCE (KEVIN LONEY)*

MCA-405: Server Administration with Linux & Windows

UNIT – I

Linux introduction and file system - Basic Features, Different flavors of Linux. Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell. Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp & comm, View files, disk related commands, checking disk free spaces. Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down process.

UNIT-II

Essential linux commands Understanding shells, Processes in linux - process fundamentals, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands - wc, cut, dd, etc. Mathematical commands- bc, expr. Creating and editing files with vi& vim editor.

UNIT-III

System administration: Common administrative tasks, configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel. Backup and restore files, installing and removing packages with rpm command. KDE & Gnome graphical interfaces.

UNIT-IV

Shell programming- Basic of shell programming, Various types of shell available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions – grep, egrep, and sed.

UNIT-V

Basic networking administration: Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to Internet, common networking administrative tasks, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands, TCP/IP network, DNS services, routing using Linux
Installation & Administration of mail server, ftp server and Apache web server.

TEXT & REFERENCE BOOKS:

- *UNIX - CONCEPTS & APPLICATIONS (THIRD ED.) - SUMITABHA DAS, TATA MCGRAW HILL PUBLICATIONS.*
- *UNIX FOR PROGRAMMERS AND USERS (THIRD ED.) - GRAHAM GLASS & KING ABLES, PEARSON EDUCATION INDIA.(LOW PRICES EDITION).*
- *FEDORA CORE 6 BIBLE*
- *RED HAT LINUX 9 BIBLE – CRISTOPHER NEGUS, IDG BOOKS INDIA LTD.*
- *USING LINUX BY JACK TACKETT, DAVID GUNTER, PHI, EEE EDITION*
- *LINUX INSTALLATION AND ADMINISTRATION, NICHOLAS WELLS, COURSE TECHNOLOGY (VIKAS PUBLISHING, NEW DELHI).*
- *UNIX SHELL PROGRAMMING - YASHWANT KANETKAR, BPB PUBLICATIONS,*
- *RED HAT LINUX UNLEASHED TECHMEDIA (BPB PUBLICATIONS)*
- *LINUX NETWORKING AND SECURITY - WELLS, COURSE TECHNOLOGY (VIKAS PUBLISHING, NEW DELHI)*

MCA-501: Artificial Intelligence

UNIT – I

Concept of intelligence, Artificial intelligence, definition turning test, areas of application. Search techniques, state space, Production rules, problem characteristics, production system characteristic, depth first, breadth first search methods and their analysis, Heuristic search method, generate and test, hill climbing, best first method, graph search, AND OR search methods, constraint satisfaction, backtracking.

UNIT-II

Introduction to list and string processing and dynamic databases concept of knowledge, characteristics and representation schemes, Logic, propositional and predicate calculus, resolution, semiatics nets, frames, conceptual dependency, scripts Monotonic reasoning, logical reasoning induction, natural deduction

UNIT-III

Nonmonotonic reasoning – default reasoning minimalist reasoning, statistical reasoning – Baye’s theorem, certainty factors, dempster shafer theory, Fuzzy logic. Concept of learning, inductive and deductive. Knowledge acquisition, rote learning, discovery analogy

UNIT-IV Concept of expert system, need for an expert system, Component and categories of an expert system, need for an expert system, Stages in the development of an expert system.

UNIT-V

Back propagation, radial basis functions, Neural computational models - Hopfield Nets, Boltzman machines. PROLOG programming.

Text/References:

1. Artificial Intelligence: Elaine Rich, Kevin Knight, Mc-Graw Hill.
2. Introduction to AI & Expert System: Dan W. Patterson, PHI.
3. Artificial Intelligence by Luger (Pearson Education)
4. Russel & Norvig, Artificial Intelligence: A Modern Approach, Prentice-Hall

MCA-502: Web Development with PHP

Unit-I

Introduction to PHP, History of PHP, Versions of PHP, Features of PHP, Advantages of PHP over Other Scripting Languages, Installation and Configuration of PHP, Data Types in PHP, PHP Syntax, Comments, PHP Variables and Constants, Scope of Variables, PHP String, String Manipulation, PHP Operators, Precedence of Operators, Expressions, Creating a PHP Script, Running a PHP Script.

Unit-II

Basic HTML, Embedding PHP in HTML, Passing Information between Pages, PHP \$_GET, PHP \$_POST, PHP Conditional Statements, PHP Looping Statements, Break, Continue, Exit, PHP Functions: Built-in and User Defined Function, Regular Expression Functions, Mathematical, Date and Time Functions, PHP Arrays: Creating Array and Accessing Array Elements,

Unit-III

PHP File Permissions, Working with Files: Opening, Closing, Reading, Writing a File; Working with Directory: Creating, Deleting, Changing a Directory; Working with Forms: Introduction to a Web Form, Processing a Web Form, Validating a Web Form, Input Validation, PHP with Client Side Scripting Language, Exception and Error Handling in PHP, Introduction to Cookies and Session Handling,

Unit-IV

Working with Database: PHP-Supported Databases; Using PHP & My SQL: Installation and Configuration of My SQL on Windows, Checking Configuration, Connecting to Database, Selecting a Database, Adding Table and Altering Table in a Database, Inserting, Deleting and Modifying Data in a Table, Retrieving Data, Performing Queries, Processing Result Sets,

Unit-V

Code Re-use, require(), include(), and the include_path, File System Functions and File Input and Output, File Uploads, Use of CSS, Introduction to Object Oriented Programming with PHP, Installing and Configuring Apache to use PHP on Windows, php.ini File,

TEXT & REFERENCE BOOKS:

- PHP & MY SQL, BY VIKRAM VASWANI, TMH PUBLICATIONS
- PHP ESSENTIALS, BY JULIE C. MELONI, BPB PUBLICATIONS
- PHP 5 AND MY SQL BIBLE, BY TIM CONVERSE AND JOYCE PARK, WILEY-DREAMTECH INDIA PUBLICATIONS
- WEB TECHNOLOGIES, BLACK BOOK, DREAMTECH PRESS
- ATKINSON, LEON. CORE PHP PROGRAMMING, NEW YORK: PRENTICE HALL
- LEARNING PHP 5, BY DAVID SKLAR PUBLISHER O'REILLY MEDIA
- MASTERING PHP, BY CHARLES, PUBLISHER: BPB
- EXPERT PHP AND MYSQL, WROX PROGRAMMER TO PROGRAMMER, WROX PRESS, 2010
- PHP FOR ABSOLUTE BEGINNERS, APRESS, 2009
- SAMS TEACH YOURSELF CSS IN 24 HOURS (2ND EDITION), SAMS PUBLISHING, 2006

MCA-503A: Advance Java

UNIT I

Introduction & Requirements - Introduction to HTML , Java Server Pages – Basics – JSP Constructs – Scripting elements - directives - actions – beans – tags Introduction to apache tomcat server (installation & configuration)-start/stop tomcat services – run JSP page on Tomcat

UNIT II

JSP implicit objects, Handling Request Parameters – Form Handling (text fields / text area) – Handling multiple buttons/check boxes/radios/combo - Session Management – URL Rewriting - Hidden fields – cookies

UNIT III

Introduction to Servlet- Servlet Life Cycle – ServletRequest & ServletResponse – Writing Servlets – Requirements & Configuration ServletRequest & ServletResponse Methods & use – sending different types of data

UNIT IV

Introduction to MySQL –features, installation & configuration, creating & managing database, MySQL Driver Java Database Connectivity (JDBC) with MySql –loading MySql driver – creating connection – Statement – ResultSet

UNIT V

Java Naming Directory Interfaces – JMS – Introduction – Topic – example of Topic & Queue – EJB – Basics – stateless / client creation – statefull client creation – Container Managed Persistence – Bean Managed Persistence

TEXTS & REFERENCE BOOKS :

- **JAVA THE COMPLETE REFERENCE BY PATRICK NAUGHTON AND HERBERT SCHILDT. TMH PUBLICATION ISBN 0-07-463769-X**
- **PROGRAMMING WITH JAVA BY E. BALAGURUSWAMY TMH PUBLICATIONS ISBN 0-07-463542-5**
- **USING JAVA 1.2 BY JOSEPH WEBER. PHI – ISBN-81-203-1558-8**

MCA-503B: ANDROID PROGRAMMING

Chapter 1: Introduction to Android. What is Android? Setting up development environment o Dalvik Virtual Machine & .apk file extension; Fundamentals: (a) Basic Building blocks - Activities, Services, Broadcast Receivers & Content providers, (b) UI Components - Views & notifications, (c) Components for communication -Intents & Intent Filters o Android API levels (versions & version names)

Chapter 2: Application Structure (in detail), AndroidManifest.xml , uses-permission & uses-sdk, Resources & R.java, Assets, Layouts & Drawable Resources, Activities and Activity lifecycle, First sample Application.

Chapter 3: Emulator-Android Virtual Device ; Launching emulator ; Editing emulator settings ; Emulator shortcuts ; Logcat usage ; Introduction to DDMS ; Second App:- (switching between activities) Develop an app for demonstrating the communication between Intents

Chapter 4: Basic UI design ; Form widgets ; Text Fields ; Layouts ; [dip, dp, sip, sp] versus px ; Examples

Chapter 5: Preferences ; SharedPreferences ; Preferences from xml ; Examples Chapter 8: Menu ; Option menu ; Context menu ; Sub menu ; menu from xml ; menu via code ; Examples

Chapter 6: Intents (in detail) o Explicit Intents ; Implicit intents ; Examples

Chapter 7: UI design ; Time and Date ; Images and media ; Composite ; AlertDialogs & Toast ; P;pup ; Examples

Chapter 8: Tabs and Tab Activity ; Examples

Chapter 9: Styles & Themes ; styles.xml ; drawable resources for shapes, gradients (selectors) ; style attribute in layout file ; Applying themes via code and manifest file ; Examples

Chapter 10: Content Providers ; SQLite Programming ; SQLiteOpenHelper ; SQLiteDatabase ; Cursor ; Reading and updating Contacts ; Reading bookmarks ; Example : Develop an App to demonstrate database usage. CRUD operations must be implemented. Final details should be viewed in GridView as well as in ListView.

Chapter 11: Android Debug Bridge (adb) tool

Chapter 12: Linkify ; Web URLs, Email address, text, map address, phone numbers ; MatchFilter & TransformFilter ; Examples

Chapter 13: Adapters and Widgtes ; Adapters:- a. ArrayAdapter b. BaseAdapters ; ListView and ListActivity ; Custom listview ; GridView using adapters ; Gallery using adapters ; Examples

Chapter 14: Notifications ; Broadcast Receivers ; Services and notifications ; Toast ; Alarms ; Examples

Chapter 15: Custom components ; Custom Tabs ; Custom animated popup panels ; Other components ; Examples

Chapter 16: Threads ; Threads running on UI thread (runOnUiThread) ; Worker thread ; Handlers & Runnable ; AsyncTask (in detail) ; Examples

Chapter 17: Advanced ; Live Folders o Using sdcards ; XML Parsing ; JSON Parsing ; Maps, GPS, Location based Services ; Accessing Phone services (Call, SMS, MMS) ; Network connectivity services ; Sensors .

MCA-503C: PERL PROGRAMMING

UNIT-1 :

Perl Introduction, What is Perl, Perl features, Perl and the Web, Running the Perl : Interactive Interpreter, Perl Syntax overview.

UNIT-2 :

Perl file extension, Comments in Perl, Perl Identifiers. Perl Data Type : Perl Variables, Perl Scalars, Perl Arrays

UNIT-3 :

Perl Hashes, Perl conditional statements – ifelse, Perl loops, Perl Operators, Perl- Data & Time, Perl Sub Routines.

UNIT -4 :

Perl References, Perl Formats, Perl File I/O, Perl Directories, Perl Error Handling, Perl Special variables, Perl Coding Standard

UNIT-5 :

Perl Regular Expressions, Perl Sending Email, Perl socket programming, OOPS in Perl, Perl Database access, Perl CGI Programing,

MCA-504A: E-Commerce

UNIT-I

E-Commerce an Introductions, Concepts, Advantages and Disadvantages, Technology in E-Commerce, Benefits and impact of E-commerce on travel industry, Goals of E-Commerce, Difference between E-Commerce and E- Business, Models of E-Commerce, Limitations and Advantages of E-Commerce.

UNIT-II

Electronic Payment Systems- Introduction, Types of Electronic Payment Systems, Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risk and Electronic Payment Systems.

UNIT-III

E-Security Network and Web Site Risk for E-Business, Information Technology Act 2000 and its Highlights Related to E-commerce, E-Security, Firewalls, Electronic Market / E- Shop, Introduction to Security, Types of Securities, Security Tools, Network Security.

UNIT-IV

E-Governance, E-democracy, Government Efforts to Encourage Citizen Participation, Privacy and Security Issues, Information Security Management Digital Divide. Applications in Governance, E-government, Government –to-business, Business-to-Government and Citizen-to-Government, E-Governance Models.

UNIT-V

Introduction of Cyber Crime, Categorizing Cyber Crime, Information Warfare- Concept, information as an Intelligence Weapon, Attacks and Retaliation, Attack and Defense. Cyber Law.

TEXT & REFERENCE BOOKS:

- *FRONTIERS OF ELECTRONIC COMMERCE, BY- KALAKOTA, RAVI; STONE, TOM; WHINSTON, ANDREW B, ADDISON WESLEY PUBLISHING CO, ISBN 8178080575*
- *E-COMMERCE AN INDIAN PERSPECTIVE BY P. TJOSEPH, S.J. PRENTICE-HALL OF INDIA*

MCA-504B: Data Warehousing & Mining

UNIT-I

Data ware housing Definition, usage and trends, DBMS vs. data warehouse, Data marts, Metadata
Data mining definition & application, DBMS vs. data mining, KDD versus data mining, data mining techniques, Data Preprocessing: need, data cleaning, integration & Transformation .

UNIT-II

Multidimensional data mode, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations, Data warehouse process & architecture, OLTP vs. OLAP, types of OLAP, ROLAP vs. MOLAP, 3 – Tier data warehouse architecture,

UNIT-III

Association Rule Mining, Single-Dimensional Boolean Association Rules Apoiri algorithm, FP growth, Multi-Level Association Rules from Transaction Databases

UNIT-IV

Classification and Prediction, Concepts of Decision Tree Induction and Bayesian Classification
Cluster Analysis, Categorization of methods, Partitioning methods, K-Means algorithm, Outlier Analysis, Hierarchical methods.

UNIT-V

Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, Web Mining concepts

TEXT & REFERENCE BOOK:

- *DATA MINING – CONCEPTS & TECHNIQUES; JIAWEI HAN & MICHELINE KAMBER – ELSEVIER*
- *DATA WAREHOUSING FUNDAMENTALS; PAULRAJ PONNIAH, WILEY*
- *DATA MINING TECHNIQUES; ARUN PUJAR; 2001, UNIVERSITY PRESS; HYDERBAD.*
- *INTRODUCTION TO DATA MINING WITH CASE STUDIES; G.K. GUPTA, PHI*

MCA-504C: Software Project Management

UNIT -I

Software Project Management: Overview, Software Project Management Framework, Problems in Software Projects. Scope Management, Communication Techniques and Tools. Requirement Specifications, Resources types for a Software Projects.

UNIT -II

Software Project Estimation: Work Breakdown Structure (WBS), Steps in WBS, Measuring Efforts for a Project, Project Scheduling: Scheduling and its Need, Scheduling Basics, Gant Chart,

UNIT-III

Testing Basics And Development Models: Principals and Context of Testing In Software Production, Software Quality Control and its Relation With Testing, Validating And Verification, White Box Testing: White Box Testing - Static Testing, Structural Testing-Unit ,Code, Functional Testing, Code and Complexity Testing,.

UNIT -IV

Black Box Testing- Positive and Negative Testing, Boundary Value Testing, Equivalence Partitioning, User Documentation Testing, Integration Testing: Introduction and types of Integration Testing, Scenario Testing, System and Acceptance Testing- Acceptance Testing.

UNIT -V

Performance Testing- Introduction, Factors Related too Performance Testing, Methodology For Performing Testing, Regression Testing, Overview Testing Tools: Win runner, Load runner, Test Director.

TEXT & REFERENCE BOOKS:

- *SOFTWARE TESTING: PRINCIPLES AND PRACTICE BY GOPALASWAMY AND SRINIUSAN, 81775812 LX. PUBLISHER, PEARSON EDUCATION INDIA. ISBN, 81775812 LX.*
- *SOFTWARE TESTING T OOLS : COVERING WINRUNNER, SILK T EST, LOADRUNNER, JMETER AND T ESTDIRECTOR WITH CASE BY DR. K. V.K.K. PRASAD, ISBN: 8177225324, WILEY DREAMTECH,*
- *HTTP://WWW.COLUMBIA.EDU/ -JM221 7/*
- *BASICS OF SOFTWARE PROJECT MANAGEMENT BY NIIT ,, PRENTICEHALL OFLNDIA,ISBN 81-203-2490-0*
- *SOFTWARE PROJECT MANAGEMENT BY BOB HUGHES & MIKE COTTERELL, T ATA MCGRAW HILL, ISBN 0-07-061 985-9*

MCA-601: Advance Computer Architecture

UNIT I PIPELINING AND ILP

Fundamentals of Computer Design - Measuring and Reporting Performance - Instruction Level parallelism and Its Exploitation - Concepts and Challenges - Overcoming Data Hazards with Dynamic Scheduling – Dynamic Branch Prediction - Speculation - Multiple Issue Processors – Case Studies.

UNIT II ADVANCED TECHNIQUES FOR EXPLOITING ILP

Compiler Techniques for Exposing ILP - Limitations on ILP for Realizable Processors - Hardware versus Software Speculation - Multithreading: Using ILP Support to Exploit Thread-level Parallelism - Performance and Efficiency in Advanced Multiple Issue Processors - Case Studies.

UNIT III MULTIPROCESSORS

Symmetric and distributed shared memory architectures – Cache coherence issues - Performance Issues – Synchronization issues – Models of Memory Consistency - Interconnection networks – Buses, crossbar and multi-stage switches.

UNIT IV MULTI-CORE ARCHITECTURES

Software and hardware multithreading – SMT and CMP architectures – Design issues – Case studies – Intel Multi-core architecture – SUN CMP architecture – IBM cell architecture.- hp architecture.

UNIT V MEMORY HIERARCHY DESIGN

Introduction - Optimizations of Cache Performance - Memory Technology and Optimizations Protection: Virtual Memory and Virtual Machines - Design of Memory Hierarchies - Case Studies.

REFERENCES

1. John L. Hennessey and David A. Patterson, “Computer Architecture – A quantitative approach”, Morgan Kaufmann / Elsevier, 4th edition, 2007.
2. David E. Culler, Jaswinder Pal Singh, “Parallel Computing Architecture: A hardware/ software approach” , Morgan Kaufmann / Elsevier, 1997.
3. William Stallings, “Computer Organization and Architecture – Designing for Performance”, Pearson Education, Seventh Edition, 2006.

MCA-602A: Advance Operating System

UNIT-I

Definitions, functions and types of operating system, components, Operating system Services, System Calls, programs, System structure

UNIT –II

Process Concepts, process state & process control block, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, MultipleProcessor Scheduling Real-Time Scheduling, Threads,

UNIT –III

Critical Section Problem , Semaphores, Classical Problem Of Synchronization, , Deadlock Characterizations, Method for Handling,Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock .

UNIT –IV

Logical versus physical address space, Swapping, Contiguous Allocation, Paging, Segmentation, Virtual Memory, Demand Paging, Page Replacement, Page Replacement Algorithms,

UNIT –V

Disk Scheduling, Disk Management, Swap Space Management, Disk. reliability, Stable Storage Implementation. File Concepts Directory structure, Protection, File system in Linux.

TEXT & REFERENCE BOOKS:

- *OPERATING SYSTEM CONCEPTS BY SILBERSCHATZ & GALVIN, ADDISON EDITION.*
- *OPERATING SYSTEM CONCEPTS & DESIGN BY MILAN MILEN KOVIC, WESLEY PUBLICATION 6*
- *OPERATING SYSTEM CONCEPTS & DESIGN BY MILAN MILEN KOVIC, TMH PUBLICATION*

MCA-602B : Embedded System

UNIT I EMBEDDED COMPUTING

Challenges of Embedded Systems – Embedded system design process. Embedded processors – ARM processor – Architecture, ARM and Thumb Instruction sets

UNIT II EMBEDDED C PROGRAMMING

C-looping structures – Register allocation – Function calls – Pointer aliasing – structure arrangement – bit fields – unaligned data and endianness – inline functions and inline assembly – portability issues.

UNIT III OPTIMIZING ASSEMBLY CODE

Profiling and cycle counting – instruction scheduling – Register allocation – conditional execution – looping constructs – bit manipulation – efficient switches – optimized primitives.

UNIT IV PROCESSES AND OPERATING SYSTEMS

Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Exception and interrupt handling - Performance issues.

UNIT V EMBEDDED SYSTEM DEVELOPMENT

Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design methodologies – Case studies – Complete design of example embedded systems.

REFERENCES

1. Andrew N Sloss, D. Symes, C. Wright, "ARM System Developers Guide", Morgan Kaufmann / Elsevier, 2006.
2. Michael J. Pont, "Embedded C", Pearson Education , 2007.
3. Wayne Wolf, "Computers as Components : Principles of Embedded Computer System Design", Morgan Kaufmann / Elsevier, 2nd edition, 2008.
4. Steve Heath, "Embedded System Design" , Elsevier, 2nd edition, 2003.

MCA-602C : Big Data Analysis using Hadoop

Introduction to Hadoop

- Hadoop Distributed File System
- Hadoop Architecture
- MapReduce & HDFS

Hadoop Eco Systems

- Introduction to Pig
- Introduction to Hive
- Introduction to HBase
- Other eco system Map

Hadoop Developer

- Moving the Data into Hadoop
- Moving The Data out from Hadoop
- Reading and Writing the files in HDFS using java program
- The Hadoop Java API for MapReduce
 - o Mapper Class
 - o Reducer Class
 - o Driver Class
- Writing Basic MapReduce Program In java
- Understanding the MapReduce Internal Components
- Hbase MapReduce Program
- Hive Overview
- Working with Hive
- Pig Overview
- Working with Pig
- Sqoop Overview
- Moving the Data from RDBMS to Hadoop
- Moving the Data from RDBMS to Hbase
- Moving the Data from RDBMS to Hive
- Flume Overview
- Moving The Data from Web server Into Hadoop
- Real Time Example in Hadoop
- Apache Log viewer Analysis
- Market Basket Algorithms