# Maharshi Dayanand University Rohtak
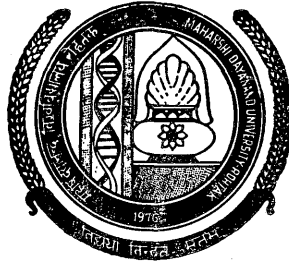


65 Syllabus

# Ordinances, Syllabus and Courses of Reading for Master of Computer Applications (in Distance Education Mode) Examination

## Session—2002-2003

# MAHARSHI DAYANAND UNIVERSITY, ROHTAK

## Master of Computer Applications (MCA)
### (In Distance Education Mode)

The University has introduced from Jan., 2001 session various computer education programmes namely, Advanced Post Graduate Diploma in Computer Science and Applications (APGDCA),Adcanced Post Graduate Diploma in Information Technology (APGDIT), M.Sc. (Computer Science) and Bachelor in Computer Application (BCA). The M.Sc. (Computer Science) course is designed in a way that after successful completion of first year the students will be awarded APGDCA/APGDIT and after successful completion of second year the students will be awardedM.Sc. (Computer Science). From the current session i.e. July, 2002 the Univesity intends to introduce Master of Computer Applications (MCA) which is three years course (Six Semester). The course has been created to cope with the ever increasing demand for computer personnel in almost all walks of life, especially in the industrial sector. During this course, apart from offering an intensive dose of the theoretical knowledge to the students, they would be imparted practical training in the computer laboratory and on job training in some reputed organisations also. The MCA programme is divided into six semesters as per scheme of examinations.

### Eligibility

A candidate seeking admission to Master of Computer Application (MCA) should have three years Bachelor Degree (or equivalent thereto) in any discipline. This course has also lateral entry scheme. A student who has done APGDCA/APGDIT/PGDCA/PGDCS or equivalent will get admission in MCA 3rd Semester directly and a student who has passed M.Sc. (Computer Science) or Master in Computer Science (MCS) or equivalent will get admission in MCA 5th Semester directly.

### Duration

It is three years programme comprisiong six semesters.

# MAHARSHI DAYANAND UNVERSITY, ROHTAK
## Scheme of Examinations
## Master of Computer Application (MCA) (Distance Mode)
### Duration : Three Years

| Paper No. | Title of Paper | Max. Marks | Exam Duration |
|---|---|---|---|
| **First Semester** | | | |
| MCA-01/M.Sc.-01/ APGDCA-01 | Foundation Course in IT And MS-Office 2000 | 100/40 | 3 Hrs.. each |
| MCA-02/M.Sc.-02/ APGDCA-02 | Computer Networking & Multimedia | 100/40 | 3 Hrs.. each |
| MCA-03/M.Sc.-03/ APGDCA-03 | Programming in C and Data Structure | 100/40 | 3 Hrs.. each |
| MCA-04/M.Sc.-04/ APGDCA-04 | Computer Organisation and Architecture | 100/40 | 3 Hrs.. each |
| MCA-05/M.Sc.-05/ APGDCA-05 | Practical-I (Based on M.Sc.-01 & 03) | 100/40 | 4 Hrs. each |
| **Second Semester** | | | |
| MCA-06/M.Sc.-06/ APGDCA-06 | Visual C + + | 100/40 | 3 Hrs. each |
| MCA-07/M.Sc.-07/ APGDCA-07 | Visual Basic & Oracle | 100/40 | 3 Hrs. each . |
| MCA-08/M.Sc.-08/ APGDCA-08 | System Analysis & Design | 100/40 | 3 Hrs. each |
| MCA-09/M.Sc.-09/ APGDCA-09 | Practical-II (Based on M.Sc.-06 & 07) | 100/40 | 4 Hrs. each |
| MCA-10/M.Sc.-10/ APGDCA-10 | Project Work, Report & Viva-Voce (Based on any Language, Software Development Tool, etc.) | 100/40 | 4 Hrs. each |
| **Third Semester** | | | |
| MCA-11/M.Sc.-11 | RDBMS | 100/40 | 3 Hrs. each |
| MCA-12/M.Sc.-12 | Software Engineering | 100/40 | 3 Hrs. each |
| MCA-13/M.Sc.-13 | Operating System and Unix | 100/40 | 3 Hrs. each |
| | Programming in C & Data Structure* | 100/40 | 3 Hrs. each |
| MCA-14/M.Sc.-14 | Internet, Web Programming & Java | 100/40 | 3 Hrs. each |
| | Computer Organisation Architecture* | 100/40 | 3 Hrs. each |
| MCA-15/M.Sc.-15 | Practical-III (Based on M.Sc-11 & 13) (Based on M.Sc-11 & 14)* | 100/40 | 3 Hrs. each |
| **Fourth Semester** | | | |
| MCA-16/M.Sc.-16 | Artificial Intelligence | 100/40 | 3 Hrs. each |

| MCA-17/M.Sc.-17 | -Computer Graphics | 100/40 | 3 Hrs. each |
| | -System Analysis & Design* | 100/40 | 3 Hrs. each |
| MCA-18/M.Sc.-18 | -Object-oriented Analysis and Design | 100/40 | 3 Hrs. each |
| | -Microprocessor and Asembly Language* | 100/40 | 3 Hrs. each |
| MCA-19/M.Sc.-19 | Practical-IV (Based on M.Sc.-17 & 18) | 100/40 | 4 Hrs. each |
| | (Based on M.Sc.-16 & 18).* | | |
| MCA-20/M.Sc.-20 | Project Report | 100/40 | 4 Hrs. each |

* These papers are applicable to those students who have done APGDIT course from M.D.University, Rohtak.

Note:- Out of 100 marks for each paper, including Theory, Practicals & Project 25 marks are reserved for internal assessment with the following distribution

<div align="center">

Assignments : 15 Marks

Test(s) : 10 Marks

**Fifth Semester**
</div>

| MCA-21 | Internet Programming using C# | 100/40 | 3 Hrs. each |
| MCA-22 | Software Testing and Quality Assurance | 100/40 | 3 Hrs. each |
| MCA-23 | Windows Programming | 100/40 | 3 Hrs. each |
| MCA-24 | IT Management | 100/40 | 3 Hrs. each |
| MCA-25 | Software Lab Based on MCA-21 & MCA-23 | 100/40 | 4 Hrs. each |

<div align="center">

**Sixth Semester**
</div>

| MCA-26 | Major Project | 200 | |
| Distribution of marks: Thesis/Project: | | 125 | |
| Viva-Voce Examination | | 50 | |

Marks will be awarded on the basis of Viva-voce examination conducted by one examiner (External only) Thesis/Project Report will be submitted in triplicate (Hard Bound) with proper certification by the supervisor concerned who may be a person with five years working experience and must have Master's degree in relevant field or a regualr teacher working in Govt./ Semi-Govt. Institution/University/Engineering College.

Students are advised to come prepared for presentation/ demonstration of their Thesis/Project at the time of their final viva-voce examination.

Note:- Out of 100 marks for each paper, including Theory, Practical & Profject 25 marks are reserved for internal assessment with the following distribution.

* Assignments : 15 Marks

* Test(s) : 10 Marks

## FIRST SEMESTER

## MCA-01/M.SC.-01/APGDCA-01

## Foundation course in IT & MS-Office 2002

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

i) The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii) All questions will carry equal marks.

***Introduction:*** Historical evolution of computers, Classification of computers, Model of a digital computer; Functioning of a digital computer, Why computers are useful ? 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 and Boolean Algebra:*** What is Number system, necessity of binary number system, binary, octal and hexadecimal number system, inter-conversion of numbers, binary arithmetic, character codes, concepts of Boolean Algebra and its requirement.

***Input/Output Devices:*** Punched cards, card-readers, Key-punching machines, keyboards, mouse, joysticks, trackballs, digitizer, voice-recognition, optical-recongnitión, 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.

**Software Concepts:** Introduction, types of software-System & Application software; Language translators -Compiler, Interpreter, Assempler; 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.

**Social Concerns:** Positive and Negative Impacts of Computer Technology, Viruses and their types, Computer Crimes.

**Applications of Computers:** Scientific, Education, Medicines & Health, Research, Sports, etc.

**MS-Office 2000**

**MS-Word:** Introduction to MS-Word, Standard Toolbar, WordWrap, Text formatting, Formatting Pararaphs, Aplying Effects to Text, Applying Animation to Text.

**MS-Excel:** Introduction to MS-Excel, Working with Toolbars, Formatting, Formulas, Data Management, Graphs & Chart, Macros, and other additional Functions.

**MS-Power Point:** Introduction, PowerPoint Slide Creation, Slide-show, Adding Graphics, Formatting Customizing and Printing.

**MS-Access:** Introduction, Understanding Databases, Creating a Database and Tables Automatically, Creating and Customizing a Form, Adding, Editing, Sorting and Searching of Records, Creating and Printing Reports, Queries, Creating a Database and Application, Linking, Importing and Exporting Data, Form, Creating Reports, Creating Charts and Pivot Tables.

**References**

1.     Essentials of Computer and Network Technology by Nasib S. Gill (Khanna Book publishing Co.)

2.   Computers Today by Donald Sanders (McGraw-Hill Publishers)

3.   Introduction to Computers by Davis (McGraw-Hill Publishers)

4.   Fundamental of Computers by V. Rajaraman (Prentice-Hall India Ltd.)

5.   Teach Yourself MS-Office by Sandler (BPB Publications)

6.   Using Microsoft Office 2000 by Bott (Prentice Hall-India)

7.   Microsoft Office 2000 8-in1 by Habraken(Prentice-Hall of India)

8.   Using Microsoft Office 97 by Bott (Prentice Hall-India)

9.   ABCs of MS-Office by Hart (BPB)

10.  Learning MS-Office 2000 by R. Bangia (Khanna Book Publishing Co.)

11.  Any other book/manual covering contents of this paper.

### MCA-02/M.SC.-02/APGDCA-02

### Computer Networking & Multimedia

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

i)   The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii)  All questions will carry equal marks.

*Computer Networking*

Introduction to Computer Network, Why Computer Network? Key Issues for Computer Network, Types of Network: LAN, WAN and MAN: Criteria for Classification of Computer Network, LANs: Harware requirements for LAN, Transmission Channel for LAN, Network Interface Unit, Servers & Workstations, LAN Sortware, Introduction to Ethernet, Token Ring: Basics and Working, Cables, ring speed. WAN: Transmission Chanel for LAN, hardware requirements: Bridges,

Private Networks, Public Networks: ISDN, PSTN, PSDN, Value Added Networks.

Connecting PCs: Simple switches, Printer sharing buffers, Zero-slot LANs, Media sharing LANs, Printer Servers, Client and Servers, Interface Cards, Media Access Control, Operating System features, OSI Model, TCP/IP Model, Data encoding & Communication Techniques, Multiplexing and Communication Hardware.

Network topology, Network Protocols, Applications of Computer Network. Distributed data processing, Teletext and Videotext Networks.

Communication Channels: Wire cables (Telegraph, telephone, twisted-pair, co-axial), Microwave, Fibre-optics, Communcation satellites; Channel sharing, data-transmission.

## Multimedia

Introducation to multimedia technology-Computers, Communication and Entertainment; Framework for multimedia system; M/M devices, presentation devices and the user interface; M/M presentation and authoring; Digital representation of sound and transmission; brief survey of speech recognition and generation; digitial video and image compression; JPEG image compression standards; MPEG motion video compression; DVI technology; time-based media representation and delivery.

Audio Compression and Decompression, Audio Synthesis, MIDI, Speech Recognition & Synthesis, Video Capturing, Compression & Decompression, Real-time 3D, LANs and Multimedia.

Application of M/M ; Intelligent M/M system, Desktop Virtual Reality (VR), VR operating System, Virtual environment displays and orientation tracking; visually coupled system requirements; intelligent VR software systems.

Applications of environments in various fields viz. Entertainment, manufacturing, business, education, etc.

## References

1.    Essentials of Computer and Network Technology by Nasib S. Gill (Khanna Book Publishing Co.)

2.     Inside the PC by Peter Norton (Prentice Hall India)

3.     Using Networks by Frank Derfler (Prentice Hall India)

4.     Introduction to Networking by Nance (Prentice Hall India)

5.     Network Concepts & Architecture by Hancock (BPB Publications)

6.     Multimedia: An I(ntroducation by Villamil & Molina (Prentice Hall India)

7.     Multimedia: Sound & Video by Lozano (Prentice Hall India)

8.     Multimedia: Production, Planning and Delivery by Villamil & Molina (Prentice Hall India)

9.     Multimedia on the PC by Sinclair (BPB Publications)

10.    Any other book/manual Covering contents of this paper.

### MCA-03/M.SC.-03/APGDCA-03

**Programming in C and Data Structure**

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

   i)  The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

   ii)  All questions will carry equal marks.

***Algorithm Development***

Introduction to Problem Solving: Top Down Design, Algorithm, Characteristics of Algorithm, Implementation of Algorithms, Efficiency of Algorithms, Analysis of Algorithm.

Fundamental algorithms, Array Techniques, Merging, Sorting & Searching Techniques, Text Processing and Pattern Search, Dynamic Data Structure Algorithms; Recursive Algorithms.

Elements of Program Style, Floweharts: Flowchart Symbols, Its Types, Benefits and Limitations; Decision Tables, Pseudocodes: Using User Input, Files, Reports and Output on Paper/Console; Practice of Algorithm Development and Flowcharting.

## C Programming

Basic concepts of Programjing, problem solving, algorithm designing and flowcharting, concept of structured programming, evolution of C language, advantages of C; variables and constants, operators, expressions, loops, arrays, functions, structures, pointers, file-handling pre-processing, header-files.

## Data Structure

Fundamental notations: Primitive and Composite data types. Time andSpace complexity of algorithms.

Data Structure: Arrays, Stacks, Queues, Linked Lists, Trees and Graphs.

File Structures: Concepts of Fields, records and files. Sequential file organisation, ISAM, Hashing techniques, Inverted Lists and Multilists.

Sorting: Internal and External sorting. Searching techniques and Merging algorithms.

## References

1. How to Solve it by Computer? by R.G. Dromey (Prentice Hall India)

2. Teach Yourself Data Structures and Algorithms by Robert Lafore (Techmedia)

3. Theory & Problems of Data Processing by Lipschutz, & Lipschutz (Schaum's Outline Series: Tata McGraw-Hill)

4. C Programming by E. Balagurusamy (Tata McGraw-Hill)

5. C Programming byGottfried (Schaum's Outline Series-Tata McGraw-Hill)

6. Let Us C by Yeshwant Kanetkar (BPB Publications)

7. Data Structure and File Management by Loomis (Prentice-Hall India Ltd.)

8. Data Structure (Schaum's OutlineSeries, Tata McGraw-Hill)

9.      Data Structure Using C by Tannenbaum (Tata McGraw-Hill)

10.     Any other book covering the contents of the paper.

### MCA-04/M.Sc.-04/APGDCA-04

### Computer Organisation And Architecture

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

i)   The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii)  All questions will carry equal marks.

***Representation of Information:*** Number Systems, Integer and Floating-point representation, Character codes -ASCII and EBCDIC.

***Basic Building Blocks and Circuit Design:*** OR, AND , NOT, XOR Gates; De Morgan's theorem, Universal building blocks, laws and theorems of boolean algebra, Simplifying logic circuits- sum of product and product of sum form, algebraic simplification, Karnaugh simplification; arithmetic circuits; flip-flops, counters; shift registers; encoder, decoder, multiplexor, demulti-plexor circuits.

***Register transfer and Micro-operations:*** Register Transfer Language, Bus and memory. Transfers, Arithmetic. Logic Micro-operations, Shift Micro-operations.

***Basic Computer Organizsation and Design:*** Instruction and instructions Codes, Computer instructions, Timing and Control, Instruction  Cycle, Memory Reference Instructions, Input-Output and Interrupts; Complete Computer Description.

***Programming the Basic Computer:*** Macline Language, Assembly Language, The assembler, Program loops, programming Arithmetic and Logic, Subroutines, Inputs-Outputs programming. Micro-programmed Control; Control Memory, Address Sequencing, Micro-programe Example, Design of  Control Unit.

**Central Processing Unit:** General Register Organization Stack Organization Instruction Formats, Addressing Modes, Data and Transfer Manipulation, Program Control, Reduced Instruction Set Computer, Pipeline and Vector Processing parallel processing pipelining, Arithmetic Pipeline, RISC Ouoekubem Vector Processing, Arrays Processors.

**Computer Arithmetic:** Addition and Subtraction, Multiplication Algorithms, Division algorithm, Floating-Piont Arithmetic Operations, decimal arithmetic Unit, Decimal Arithmetic Operations.

**Input-Output Organization:** Peripheral Devices, Input-Output interface, Asynchronous Data Transfer, Modes of transfer, Priority interrupt, Direct Memory Access (DMA), input-output processors (IOP), serial communication multi-processors, characteristics of multi-processors, Inter-connenction structures, Inter-processor Arbitration, Inter-processor Communication and Synchronization, Cache Coherence.

**References**

1. Computer System Architecture by M.M. Mano (Prentice-Hall of India Ltd.)

2. Computer Architecture and Organisation by J.P. Hayes (Tata McGraw-Hill)

3. Computer Architecture and Organisation by William Stallings

4. Essentials of Computer and Network Technology by Nasib S. Gill (Khanna Book Publishing Co.)

5. Computer Organisatyin and Architecture by C.W. Gear (Prentice Hall of India Ltd.)

6. Any other book covering the contents of the course.

**MCA-05/M.Sc.-05/APGDCA-05 Practical-I**

**(Based on MCA/M.Sc./APDGCA-01 & 03)**

Max. Marks : 100

Time Allowed : 4 Hrs.

- MS-Office 20000 (MS-World, MS-Excel, MS-Power Point, MS-Access)

- **C Programming and Data Structure**
- **Distrubution of Marks (75 Marks)**

  ⇒ **MS-Office 2000**                    :   **30 Marks**

  ⇒ **C Programming & Data Structure** :   **30 Marks**

  ⇒ **Viva-Voce**                          :   **15 Marks**

### SECOND SEMESTER

### MCA-06/M.Sc.-06/APGDCA-06

### Visual C + +

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

i) The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii) All questions will carry equal marks.

Introudction to Visual C + +, Getting started with Visual C + +, Reading Keystrokes from the Keyboard, Handling mouse in VC + +, Creating Menus, Toolbar Buttons, Status Bar prompts. Dialog Boxes: Using Buttons and Text Boxes, Creating Check boxes and Radio Buttons, LIST Boxes, Combo Boxes and Sliders, File Handling, Multiple documents, and Multiple Views, creating Internet Programs- including a Web Browser, Creating Active X controls.

**Com:** Introduction, Building and using COM Servers in VC + +, Building and Using Active X controls in VC + +, Building Internet COM components with VC + +, COM Security, New COM features Features in Windows 2000, Debugging and Profiling COM Components, Deploying COM Applications.

### References

1.    Teach yourself VC + + in 21 days by Chapman (Techmedia).

2.    Practical Visual C + + 6 by Bates & Tompkins (Prentice-Hall of India)

3.    Special Edition Using Visual C + + 6 by Gregory (Prentice-Hall of India)

4.     Teach yourself VC + + in 24 hours by Williams.

5.     COM/DCOM Primer Plus by Waite,Group (Techmedia).

6.     Any other book/manual covering contents of this paper.

## MCA-07/M.Sc.-07/APGDCA-07

### Visual Basic & Oracle

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

    i)   The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

    ii)  All questions will carry equal marks.

### *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.

### *Oracle*

***Introduction to Oracle:*** Overview of RDBMS, Getting started, Modules of Oracle, Invoking SQLPLUS, Data types, Data Constraints, Operators, Data manipulation-Create, Modify, Insert, Delet e and Update; Searching, Matching and Oracle Functions.

***SQL \*Forms :*** Basic concepts, Form Construction, Creating default form,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/SOL, package functions, package procedures, Oracle transactions.

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

SQL\* Menu: Various menu styles, using pull-down & bar-menu, Authorisation 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 functions? Where do procedures & functions reside ?

**Database Triggers:** Introduction, Use & type of database Triggers, Database Triggers Vs SQL* Forms, Database Triggers Vs. Declarative Integrity Constraints, How to apply Triggers? Before Vs. After Trigger Combinations, Creating a Trigger, Dropping a Trigger.

**Utilities :** Export/Import, SQL* Loader.

**References**

1.      Using Visual Basic 6 by Reselman & Other (Prentice-Hall of India)

2.      Visual Basic 6 from Scratch by Donald & 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.

## MCA-08/M.Sc.-08/APGDCA-08

### System Analysis & Design

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

   i)   The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

   ii)  All questions will carry equal marks.

Overview of system analysis and design. Business systems concepts, system development life cycle, project selection, feasibility, analysis, design, implementation, testing and evaluation.

Project Selection: Source of Project requests, managing project review and selection, preliminary investigation.

Feasibility Study: Technical and economical Feasibility, cost and benefit analysis.

System requirement specification and Analysis: Fact finding techniques, Data flow diagrams, data dictionaries, process organisation and interactions, Decision analysis, decision trees and tables.

Detailed design modularisation, modula specification, file design, system development involving data bases.

System Control and Quality: Assurance 4-Design objectives reliability and maintence, software design and documentation tools top down, bottom up and variants, Units and intergration testing, testing practices and plans. System Controls, Audit trails.

System Administration and Testing: conversion, and operaion plans.

Hardware andSoftware Selection: Hardware acquisition, memory process, peripherals, bench marking, vendor selection, softwae selection-operating system languages, language process, performance and acceptance criteria.

### References

1.    System Analysis andDesign by E.M. Awad (Galgotia Publications)

2.    System Analysis and Design by Award, E.Homewood (Irwin Press)

3.    Systems Analysis and Design (Joint Volume) by Lee (NCC-Galgotia Publications)

4.    Analysis of Design of Information Systems by James (McGraw-Hill)

5.    Any other book covering the contents.

### MCA-09/M.Sc.-09/APGDCA-09

### Practical-II-Software Lab

(Based on MCA/M.Sc./APGDCA-06 & 07)

# MCA-10/M.Sc.-10/APGDCA-10
## Project Work, Report & Viva-Voce
(Based on any Language, Software Development Tool, etc.)
## THIRD SEMESTER
## MCA-11/MSc-11 : RDBMS

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

    i)   The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

    ii)  All questions will carry equal marks.

***Basic Concepts:*** Introduction, Data Base user, Data models, Scheme and Instances: DBMS Architecture and Data Independence, Database language, Data modelling using E-R Model.

***Relational Model:*** Relational Model concepts, Relational model "constraing, Update operations on relations. The relational Algebra, SQL-A Relational; Database Language.

***Database Design:*** Informal Design Guidances for Relation Scheme, Functional Dependencics, Normal Form Based on Primary Keys. Boyee-cod Normal Form, Multivalued Dependencies and Forth Normal Form. The Database Design Process.

***Query-Processing:*** Basic Algorithms for Executing query operations, Using Neuristics in Query optimisation.

***Concurrency Control :*** Concepts, Locking Techniques for concurrency Control, Concurrency control based on Time stamp ordering, Multiversion concurency control Techniques.

***Distributed Database;*** Concepts, Overview of Client-server, Architecture, Data Fragmentation, Replication and Allocation Technique for Design Query Processing in Distributed Database.

***References***

1.    C.J., "Data Base System", Sixth Editin Adedilson Wesley.

2. Ramez Elmastri, Shamkant B. Nawthe, "Fundamentals of Data Base Systems," addition Wesley.

3. Any other book(s) covering contents.

### MCA-12/MSc-12 : Software Engineering

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

i) The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii) All questions will carry equal marks.

Concepts of Software Engineering, Software Characterstics, components applications, software Metrics and Models; Process and Product Metrics, Size metric, Complexity metric (McCab's Cyclometic Complexity), Halsted Theory, Function Point Analysis.

*Software Development:* Phases, Process Models, Role of Management, Role of Metrics andMeasurement, Software Quality factors.

*Planning and Software Project:* Cost Estimation, COCOMO, Pulumn, Project Scheduling, Quality Assurance Plans, project Monitoring Plans.

*System Design:* Design Objectives, Design Principles, Effective Modular Design (Financial independence, Coupling Cohession), Design Tool and Techniques, Protolyping Structured Programming.

*Coding:* Programming Prancilices, verification, Monitoring and Control.

*Testing :* Testing Fundamentals, Test case design, Functional Testing, Structural Testing, Test Plan activities during testing, Unit System, Integration Testing.

*Reliability:* Concept of Software Reliability, Software Repair and Avalabity, Software Errors and Faults Reliability Models (JM, GO, MUSA Markov) Limitations of Reliability Models.

### References:

1    Pankaj Jalote, "An integrated Approach to Software Engineering", Natrosa Pun.

2.   M.L. Shooman, "Software Engineering", McGraw Hill.

3.   Any other book(s) covering contents.

**MCA-13/MSc-13 : Operating System and Unix**

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

i)   The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii)  All questions will carry equal marks.

***Operating Systems overview:*** Operating systems as an extended machine &resource manager, Operating systems classification; Operating systems and system calls; Operating systems architecture.

***Process Management functions:*** process model, hierarchies, and implementation; process states and transitions; multi-programming, multi-tasking, multi-threading; level of schedulers and scheduling algorithms, micro-kernel architecture,

***Memory Management function:*** memory management of single user operating systems partition, swapping, paging, segmentation, virtual memory.

***Device Management function:*** I/O devices and controllers, interrupt hanlers, device independent I/O software, user-space I/O software; disk scheduling; clock hardware softwae; terminal input/output software. File management functions; file naming, structure, types, access mechanisms, attributes and operations; hierarchiecal directory systems, directory structures and directory operations; file space allocations; file sharing, file locking; symbolic links; file protection and security; distrubuted file systems.

***Concurrent Programming:*** sequential and concurrent process; precedence graph, Bernsterins condition; time-dependency and critical code.section, mutual exclusion problem; classical

process co-ordination problems; deadlock handling, inter-process communication.

***Unix Operating System:*** Overview of UNIX OS in general and implementation of all above functions in Unix Operating System)

### References

1.     Operating System by Milan Milankovic, MC-Graw Hill.

2.     Operating System Concepts by Siberschatz and Galvin Addison Wesley.

3.     Operating System by Achyut S.Godbole, Tata Mc-Graw Hill.

4.     Any other book(s) covering contents.

## MCA-13/MSc-13 : *Programming in C and Data Structure

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

i)     The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii)     All questions will carry equal marks.

### Algorithm Development

introduction to Problem Solving: Top Down Design, Algorithm, Characterstics of Algorithm, Implementation of Algorithms, Efficiency of Algorithms, Analysis of Algorithm.

Fundamental algorithms, Array Techniques, Merging, Sorting & Searching Tecniques, Text Processing and Pattern Search, Dynamic Data Structure Algorithms, Recursive Algorithms.

Elements of Program Style, Flowcharts: Flow chart Symbols, Its Types, Benefits and Limitations; Decision Tables, Pseudocodes: Using User Input, Files, Reports and Output on Paper/Console; Practice of Algorithm Development and Flowcharting.

### C Programming

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

programming, evolution of C language, advantages of C, Variables and constants, operators, expressions, loops, arrays, functions, structures, pointers, file-handling, pre-processing, header-files.

## Data Structure

Fundamental Notations: Primitive and Composite data types. Time and Space complexity of algorithms.

Data structures: Arrays, Stacks, Queues, Linked Lists, Trees and Graphs.

File Structures: Concepts of fields, records and files. Sequential file organisation, ISAM, Hashing techniques, Inverted Lists and Multilists.

Sorting: Internal and External sorting. Searching techniques and merging algorithms.

## References

1.     How to Solve it by Computer? by R.G. Dromey (Prentice Hall India)

2.     Teach Yourself Data Structures and Algorithms by Robert Lafore (Techmedia)

3.     Theory & Problems of Data Processing by Lepschutz & Lipschutz (Schaum's Outline Series : Tata McGraw-Hill)

4.     C Programming by E. Balagurusamy (Tata McGraw Hill)

5.     C programming Gottfried (Schaum's Outline Series-Tata McGraw-Hill)

6.     Let Us C by Yeshwant Kenetkar (BPB Publications)

7.     Data Structure and File Management by Loomis (Prentice-Hall India Ltd.)

8.     Data Structurees (Schaum's Outline Series, Tata McGraw-Hill)

9.     Data Structure Using C by Tannenbaum (Tata McGraw-Hill)

10.    Any other book(s) covering the contents of paper.

## MCA-14/MSc-14 :Internet, Web programming and Java

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

    i)   The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

    ii)  All questions will carry equal marks.

Internet Beginning and Current State, Hardware and Software requirement, ISP. and Internet accounts, Web-Home page, URI, Browser, Securtiy on Web, Plugms and helpers Searching tools and Search engine FTP, Gopher, Telnet and e-mail.

***Web. Authoring using HTML:*** Creating a Web page, Methods of Linking, Publishing, HTML, "Text formatting and alignment, Font Control, Arranging text in lists, Images on a Web page, Backgrounds and Colour Control, Interactive Layout with Frames.

### *Javascript*

***Programming thorugh JAVA:*** JAVA History, Java Features, Java and Internet, Java and World Wide Web, Hardware and software requrements, Java environment, Java Program Structure, Java Tokens, Java Virtual Machine, Constants, Variables and Data Types, Operators and Expressions, Decision Making and Branching, Decision Making and looping Classes and Methods, Interfaces Packages, Managing Errors and Exceptions.

### *Applet Programming*

Local and remote Applets and Applications, Applet life cycle. creating and Executable Applet, Applet, Passing Parmeters to Applies.

### *Java Beans, JDBC, CORBA, RMI.*

### *Overview of CGI Programming*

### *References:*

1.    Kris Jumnsa. "Web Programming", Brank Bros. & Co.

2.    Need Smell, "Teach Yourself Internet", Teejudia.

3.    E. Balagurusamy, "Programming with JAVA", Tata McGraw Hill.

4.    Any other book(s) covering contents.

# MCA-14/MSc-14

## *Computer Organisation and Architecture

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

i) The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii) All questions will carry equal marks.

*Representation of Information:* Number Systems, Integer and Floating-Point representation, Character codes -ASCII and EBCDIC

*Basic Building Blocks and Circuit Design:* OR, AND, NOT, XOR Gates; De Morgan's theorem, Universal building blocks, laws and theorems of boolean algebra, Simplifying logic circuits-sum of product and productof sum form, algebraic simplification, Karnaugh simplification; arithmetic circuits; flip-lops, counters; shift registers; encoder, decoder, multiplexor, demulti-plexor circuits.

*Register transfer and Micro-operations:* Register Transfer Language, Bus and memory. Transfers, Arithmetic, Logic Micro-opertions, Shift Micro-operations.

*Basic Computer Organization andDesign:* Instruction and nstructions Codes, Computer instructions, Timing and Control, nstruction Cycle, Memory Referecne Instructions, Input-Output and Interrupts; Complete Computer Description.

*Programming the Basic Computer:* Machine Language, The assembler, program loops, programmingArithmetic and Logic, Subroutines, Inputs-Outputs programming. Micro-programmed Control; Control Memory, Address Sequencing, Micro-programe Example, Design of Control Unit.

*Central Processing Unit:* General Register Organization Stack Orgfanization Instruction Formats, Addressing Modes, Data and Transfer Manipulation, Program Control, Reduced nstruction Set Computer, Pepeline and Vector Processing parallel processing Pipeline, Arithmetic Pipeline, RISC Duoekubem Vector Processing, Arrays Processors.

**Computer Arithmetic:** Addition and Subtraction, Multiplication Algorithms, Division algorithm, Floating-Point Arithmetic Operations, decimal arithmetic Unit, Decimal Arithmetic Operations.

**Input-Output Organization:** Peripheral Devices, Input-Output interface, Asynchronous Data Transfer, Modes of transfer, Priority interrupt, Direct Memory Access (DMA), input-output processor(IOP), serial communication multi-processors, characteristics of multi-processors, Inter-connection structures, Inter-processor Arbitration, Inter-processor Communication and Synchronization, Cache Coherance

### References

1. Computer System Architecture by M.M. Mano (Prentice Hall of India Ltd.)

2. Computer Architecture and Organisation by J.P. Hayes (Tata McGraw-Hill)

3. Computer Architecture and Organisation by William Stallings.

4. Essentials of Computer and Network Technology by Nasib S. Gill (Khanna Book Publishing Co.)

5. Computer Organisation and Architecuter By C.W. Gear (Prentice Hall of India Ltd.)

6. Any other book covering the contents of the course.

### MCA-15/MSc-15

#### Practical - III

(Based on MCA/M.Sc./APGDCA-11 & 14)

Max. Marks : 100

Time Allowed : 3 Hrs.

**Internet, Web programming & Java :** 60 Marks

**Viva-Voce :** 15 Marks

# FOURTH SEMESTER
## MCA-16/MSc-16
## Artificial Intelligence

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

    i)   The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

    ii)  All questions will carry equal marks.

## Scope of AI

Games theorem proving, natural language processing, vision and speech processing tobotics, expert systems, All techniques. Search knowledge, abstraction.

## Problem Solving

*State space search:* Production systems, Search space controll Depth first search, unknown search- Hill climbing best first search, branch and bound. Best First Search, Problem Reduction, Constraints, Satisfaction, Means End Analysis.

## Knowledge Representation

*Predicale logic :* Skolemzing queries, Unification, modus pones, Resolutin, dependency directed back tracking.

*Rule Based Systems:* Forward reasoning Conflict resolution, Backward reasoning. Use of non back track.

*Structured Knowlede Representation Semantic net:* Slots exceptions and defaults frames Handling uncertainty.

Probabilities reasoning, Use of certainty factor, Fuzzy logic.

## Learning

Concept of learning, learning automation, genetic algorithm, learning by induction, neural nets back propagation.

## Experts Systems

Need and justification for expert systems, Knowledge acquitions, Case studies MYCIN, RI.

## References:

1. Janki Raman, Radha Krishan. "AI & Expert System," MC-Milan.

2. Patterson. D.W., "Introduction to AI and Expert Systems"., Prentice Hall of India, 1992.

3. Any other book(s) covering contents.

### MCA-17/MSc-17

### Computer Graphics

Theory : 100 Marks

Time : 3 Hrs.

Note:

i) The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii) All questions will carry equal marks.

### Overview of Computer Graphics:

Interactive graphics, passive graphics, Advantages of Interactive Graphics.

### Display Devices:

Refresh CRT, Random-Scand and Raster Scan Monitor, Colour CRT Monitors DVST Prasma, Penel Displays, LED and LCD monitors, Hard copy devices.

### Scan conversion:

Scan converting a point, line, circle and ellipse.

### 2-D graphics transformations

(Rotations, Scaling, Translations, Reflecting Shearing), Composite 2D graphics transformations, 2-D viewing and clipping, Windowing concepts, clipping algorithms (Line, Area and Tex-Sutherland-Cohen, Mid-point subdivision), Window to view port transformtion Printitive and attributes, Exerior and Interior clipping.

### Interactive Graphics:

Concept of Positioning and Pointing, Interactive Graphio Devices (Key Boards, Touch Panels, Light Pens, Graphic tablets, Joysticks, Mouse, Voice Systems), Interactive Graphical

Techniques. Basic Positioning Methods, Constraints, Gride, Gravity field, Rubber Bond Methods, Sketching, Drgging, Inking and Painting.

**Computer Graphics Software:**

Introducation, GKS (prinutive, attributes and Viewport, Display subroutines), PHIGS/PHIGS +

**3-D Graphics:**

3D Graphics transformations (Rotation, Rotation abpout an arbritary line Scaling, Translation),Parallel and Perspective Projections, Concepts of Hidden Line, Hidden Line and Surface elimination methods (Z-Buffer, Scan-line, Painter's Subdivision). 3-D viewing and clipping 3-D Object Representatin: Wireframe model Bezier Curves and Surfaces.

**References:**

1. Plastok, Gordon Kalley, Compuiter Graphics (Scham Serier) Mc Graw Hill.
2. Newman, W.Sproul, R.F., Principles of Interactive Computer Graphics, McGraw Hill.
3. Any other book(s) covering contents.

**MCA-17/MSc-17**

**\* System Analysis & Design**

Max. Marks : 100

Time Allowed : 3 Hrs.

Note:

i) The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

ii) All questions will carry equal marks.

Overview of system analysis and design. Business system concepts, system development life cycle, project selection, feasibility, analysis, design, implementation, testing and evaluation.

Project Selection: Soure of Project requests, managing project review and selection, preliminary investigation.

System requirement specification and Analysis: Fact finding techniques, Data flow diagrams, data dictionaries, process organisation and interactions, decision analysis, decision trees and tables.

Detailed design modularisation, modula specification, file design, system development involving data bases.

System Control and Quality: Assurance 4-Design objectives reliability and maintenance, software design and documentation tools top down, bottom up and variants, Units and intergaraiton testing, testing practices and plans. System Controls, Audit trails.

System Administration and Training: coversion, and operation plans.

Hardware and Software Selection: Hardware acquisition, memory process, peripherals, bench marking, vendor selection, software selection-operating system languages, language process, performance and acceptance criteria.

**References**

1. System Analysis and Design by E.M. Awad (Galgotia Publications)

2. System Analysis and Design by Awards, E. Homewood (Irwin Press)

3. System Analysis and Design (Joint Volume) by Lee (NCC-Galgotia Publications)

4. Analysis of Design of Inormation Systems by James (Mc Graw Hill)

5. Any other book covering the contents.

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**MCA-18/MSc-18**

**Object-Oriented Analysis And Design**

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Theory : 100 Marks

Time : 3 Hrs.

**Note:**

i) The examiner has to set 8 questions in all and students will have to attempt any 5 questions.

    ii) All questions will carry equal marks.

## Abstract Data Types:

Model of Real World, Autonomy, Generation of correct Applications, Resusability Classes, Instance Values, Methods and Messages, Creating and Destroying Objects, Constraints on object and Instance Varribles, Pre and Post conditions of Methods.

## Inheritance:

Subsets as Subtypes, Sub typing of Structured Types Contrasting in inheritance with subtyping, Implicit Subtyping verses Explicit inheritance, Subtyping and dynamic binding class inheritance Redefining Instance variables, Hiding Instance Variables inheriting methods, Method Overriding, Invoking Superclass Method, Constrained Overriding, Inheritting the Interface, Excluding Super class Methods metaclasses, Explicit Support, Implicit of hiden Metaclasses, Object Oriented Languages without Metaclasses, Prototype Systems and Deligation, Multiple inheritance.

Polymorphism, Object Identity, Object Modelling concepts, Object Oriented Design, Object Oriented Programming Languages, Object Oriented Database, Object Oriented User Interface.

## Overview C + +

Linkaes, How to make a Library, Functions, Macros.

## Class and Objects:

Data Members, Member Functions, Private and Public Members, Default Labels, Data hiding aned Encapsulation, Ararys within a class, Class Function Definition and pass values.

## Opertor Overloading:

Operator Function, User Defined Type Conversion Literal, Large Objects, Assignments and Intialization, Subcripting, Function Call, Deferencing, Increment and Decrtement A string Class, Friends and Members.

**Inheritance thorugh Extending C:**

Concept of Inheritance Visibility Modes Private Public Protected Single Inheritance: Privacy derived, Publically derived.

**Streams, Teemplates and Design of Libraries:**

Output, Input, Formatting, Files, and Streams, Design of libraries.

**Object Oriented Analysis and Design:**

Object Oriented Development, System Design, Object Design, Entity Relationshiop Model, Overview of Existing methodologies.

**Semantic and Entity Relationship Modeling:**

Contrasting Design for Data bases and OOA/OOD.

**Overview of Existing Methodologies:**

Object Oriented Analysis, Object Oriented Design, Object Diagram, Dynamic Model, Functional Model.

**References**

1. Object-Oriented Modeling and Design by Rambaugh & Others (Prentice Hall)
2. Object-Oriented Programming: Fundamental and Applications by Sengupta& Chaudhuri (P.H.I.)
3. Object Oriented Programming using C + + by E. Balagursamy (Tata Mc-Graw Hill)
4. Mastering C + + by Robert Lafore.
5. Any other book(s) covering contents.

## MCA-18/MSc-18

### *Micro-processor & Assembly Language

External Marks: 75

Internal Assessment: 25

Time: 03 hrs.

Evolution of micro-procesor; Overview of Intel Pro-pentium, Motorola 68000 series, Power PC, DEC-Alphachip: RISC and CISC architecture.

Basic micro processor architecture and interface: internal architecture, external system bus architecture, memory and input/output interface.

Programming mode: general-purpose registers: poiner and index register; flag; segment registers, program invisible registers; memory addressing and adressing modes. Memory interfacing; memory address decoding; cache memory and cache controllers.

Basic I/O interface; I/O mapped I/O, memory mapped I/O; basic input/output and handshaking input/output port address decoding; 8255 programmable peripheral interface; 8279 programmbale keyboard and display interface; 8254 programmable time; 8251 programmable/communication interface; interrupts-interrupt vector, vector tables, hardware and software interrupts, 8259 programmable interrupts controller; real-time clock; direct memory access, 8237/8257 DMA controller; 8086/8088 Assembly Language Programming.

(This course should be taught in the context of 8086/8088 and its assembly language).

Note:- The examiner is requested to set 8 questins covering the whole syllabus out of which the candidates will be required to attempt any 5 questions and no full program is to be asked in this theory paper.

**Reference Books**

1.    Introduction to Microproicessors by A.P. Mathur (Tata McGraw Hill)

2.    The 8086 and 8088 Microprocessors (Programming, Interfacing, Software, Hardware, and Applications) by Walter A. Triebel & Avtar Singh (PHI)

3.    Fundamentals of Assembly Language Programming by Detmer (Galgotia Publications).

4.    IBMPC Assembly Language Programming by Abel (PHI).

5.    Any other book covering the contents of paper.

## MCA-19/MSc-19

## Practical - IV

## (Based on MCA/M.Sc./APGDCA-17 & 18)

Max. Marks : 100

Time : 4 Hrs.

➤ Computer Graphics : 30 Marks

➤ Object Oriented Programming using C + + : 30 Marks

➤ Viva-Voce & Practical Records : 15 Marks

## MCA-20/MSc-20

## Project Report

Max. Marks : 100

Time : 4 Hrs.

• A candidate is required to undergo for 2 months for developing a reasonable-size Industrial (prefereably) project based on their hand-on experience in the relevant Software Development Tools. After the completion of the project, the students has to submit a Project Report (Three Copies) and the external examiner will evaluate the Project Report and thereafter viva-voce will be conducted.

• Distribution of Marks

⇒ Project Report : 55 Marks

⇒ Viva-Voce : 20 Marks

## FIFTH SEMESTER

**MCA-21: INTERNET PROGRAMMING USING C#**

Max. Marks : 75

Time : 3 Hrs.

**Note:**

Total 8 questions may be set covering the whole syllabus and the candidate will be required to attempt any 5 questions.

Inroduction to Internet, understanding the Internet, A tower of the Internet Hardware requirement to connect to the Internet, S/W requirement and Internet Service products.

Internet Address, Mail using mail form shell acount.

Understanding the web, using the web, Advanced topics using web from a shell A/c.

Introducation to use net file types used on the Internet, Mailing lists, Telnet Talk: using talk from a shell A/c, IRC Basics, TCP/IP.

Internet Programming with C# creating applets, applications, security etc; DB connectivity options, Internet Applications, DB access, User Interface classes.

**Suggested Readings:**

1.  Jain V.K.          : The Complete Guide to C# Programming, IDG Books India (P) Ltd.

2.  Gunnerson Eric : A Programmer's Introduction to C#, IDG Books India (P) Ltd.

3.  Gill, Nasib S.    : Essentials of Computer and Network Technology, Khanna Book Pub. Co., New Delhi.

4.  Wakefield        : C##. NET Wen Developer's Guide, IDG Books India (P) Ltd.

5.  Any other book(s) covering the contents of the paper in more depth.

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

## MCA-22:   SOFTWARE TESTING AND QUALITY ASSURANCE

Max. Marks : 75

Time : 3 Hrs.

**Note:**

> **Total 8 questions may be set covering the whole syllabus and the candidate will be required to attempt any 5 questions.**

Testing and the related concepts: significance and postential; Testabliity and features of Test cases.

Software Testing techniques; WBT, BBT, Ticking Box Testing; static analysis, symbolic testing, program mutation testing,

input space, partitioning, functional program testing, data flow guided testing.

Software testing Strategies: Approach, Issues, integration, incremental, System, alpha, Beta testing etc; Comparative evaluation of techniques; Testing tools; Dynamic analysis tools, test data generators, Debugers, test drivers etc.

Technical Metrics for Software: Quality Factors, framework; Metrics for analysis, design, testing source code etc.

Object Oriented Testing: OOT strategies and issues; Test Case design, interface testing.

Quality Assureance: concept, importance and essence; FTR, structured walk through technique etc.

SW Reliability, validation, safety and Hazards Analysis; Features affecting quality of software; SQA Plan.

Quality models: ISO 9000 and SEI-CMM and their relevance.

**Suggested Readings:**

1. Meyers, G.            : The art of Software Testing, Wiley-Inter-Science.

2. Dcutsch, Willis       : Software Quality Engineering: A total Technical and Management Approach, Prentice Hall.

3. Pressman             : Software Engineering, TMH.

4. Ghazzi, Carlo        : Fundaments of Software Engineering, PHI.

5. Jalote, Pankaj       : An Integrated Approach to Softwae Engineering, Narosa Publ.

6. Doug Bell, Ian Murrey : Software Engineering - A Programming Approach, John Pugh Prentice Hall

7. Any other book(s) covering the contents of the paper in more depth.

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

## MCA-23:          WINDOWS PROGRAMMING

Max. Marks : 75

Time : 3 Hrs.

**Note:**

>    **Total 8 questions may be set covering the whole syllabus and the candidate will be required to attempt any 5 questions.**

Windows basic concepts, window API, DEF Files, creating window, message, x-windows; Mouse and Keyboard.

Introduction to resources, designing and creating menus, pop-up menus, user defined resources.

Bitmaps and dialogues; Windows animation; Font basics; Window controls; Font display, static controls, edit controls, list boxes; Psychic windows.

Overview and structure of windows programming, coding conventions; Displaying text, mouse, graphics device interfaces.

**Suggested Readings:**

1.  Any other book(s) covering the contents of the paper in more depth.

Note:- Latest good books .will be suggested and added from time to time.

## MCA-24:          IT MANAGEMENT

Max. Marks : 75

Time : 3 Hrs.

**Note:**

>    **Total 8 questions may be set covering the whole syllabus and the candidate will be required to attempt any 5 questions.**

Concept of Management and administration Management as art and profession; IT and Management: Role, Relationship, etc.

IT in Management: Function of management; planning, organizing, staffing, directing, control, leadership

communication; Organizations: Forms, principles, functional areas of management, finance, personnel, producation and marketing.

Special issues of IT Management and Experiences; Interaction between R & D and Engineering activities, Transfer of New product developments into manufactureing Technology planning and approaches; Efficient linking of user and developer.

Approaches for technological upgradation and change.

**Suggested Readings:**

1.  Any other book(s) covering the contents of the paper in more depth.

Note:- Latest good books .will be suggested and added from time to time.

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## MCA-25

### Practical - V

### (Based on MCA 21 & 23)

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Max. Marks : 100

Time : 4 Hrs.

➢ Internet Programming using C#          :     30 Marks

➢ Windows Programming                    :     30 Marks

➢ Viva-Voce & Practical Records          :     15 Marks