MCA 306: Java Programming Lab

Lab Cycle

1. Program to Demonstrate labeled looping Statements.
2. Find Volume of a box using classes.
3. Program to guess a coin flip.
4. Count the number of heads and tails in a series of a coin flips.
5. Demonstrate type conversions.
6. Implement operations on complex numbers.
7. Implement the following bank operations
   i) withdraw ii)deposit iii) Transfer
8. Demonstrate date class.
9. Implement Method Overloading.
10. Implement Constructor Overloading.
11. Program to Demonstrate on Static variables and methods.
12. Product Company Modeling – Multilevel Inheritance.
13. Payroll System – Hierarchical Inheritance.
14. Implement Method Overloading.
15. Demonstrate Constructor chaining in Inheritance.
16. Program that demonstrates fields shadowing.
17. Demonstrate the use of final.
18. Implementation of base class reference (Implement Dynamic Binding).
19. Student database using Interfaces.
20. Implement string sorting using command line arguments.
21. Implement any sorting technique for sorting given 'n' elements.
22. Implement possible operations on matrix.
23. Sorting the characters of a given string.
24. Program that demonstrate Exception Handling.
25. Program that demonstrate wrapper classes.
26. Convert an ordinary text file to HTML file.
27. Copies the content of one file to another file.
28. Perform DML commands on a particular table.
29. Implement authentication technique using applets.
30. Implement event handling in Applets.
31. Program for Deadlock Handling.
32. Program for Producer – Consumer problem.
33. Implement Process Synchronization.
34. Program that demonstrate process state.
35. Construct servlet using httpservlet class
36. Illustration of Initializing, implementing and destroying the servlet.
37. Program for establishing a socket connection.

MCA 307: Unix Shell Programming Lab

Lab Cycle

1) Write a shell script to accept two numbers and perform all arithmetic operations on it
2) Write a shell script to find largest of three numbers using conditional execution operators
3) Write a shell script to check whether a particular user has logged in or not. If he has logged in, also check whether he has eligibility to receive a message or not
4) Write a shell script to accept the name of the file from standard input and perform the following tests on it
    a) File executable
    b) File readable
    c) File writable
    d) Both readable & writable
5) Write a shell script which will display the username and terminal name who login recently in to the unix system
6) Write a shell script to find no. of files in a directory
7) Write a shell script to print the following format

    1
    12
    123
    1234
8) Write a shell script to print prime numbers up to a given range using arguments
9) Write a shell script which will display the number of days in the given month and year
10) Write a shell script to check whether a given number is perfect or not
11) Write a menu driven shell script to copy, edit, rename and delete a file
12) Write a shell script for concatenation of two strings
13) Write a shell script which will display Fibonacci series up to a given number of argument.
14) Write a shell script to accept student number, name, marks in 5 subjects. Find total, average and grade. Display the result of student and store in a file called stu.dat.

    Rules: avg>=80 then grade A
    Avg<80&&Avg>=70 then grade B
    Avg<70&&Avg>=60 then grade C
    Avg<60&&Avg>=50 then grade D
    Avg<50&&Avg>=40 then grade E
    Else grade F
15) Write a shell script to accept empno,empname,basic.
    Find DA,HRA,TA,PF using following rules. Display empno, empname, basic, DA,HRA,PF,TA,GROSS SAL and NETSAL. Also store all details in a file called emp.dat

    Rules: HRA is 18% of basic if basic > 5000 otherwise
    550
    DA is 35% of basic

PF is 13% of basic
IT is 14% of basic
TA is 10% of basic

16) Write a shell script to demonstrate break and continue statements
17) Write a shell script to satisfy the following menu options
    a) Display current directory path
    b) Display todays date
    c) Display users who are connected to the unix system
    d) Quit
18) Write a shell script to delete all files whose size is zero bytes from current directory
19) Write a shell script to display string palindrome from given arguments
20) Write a shell script which will display Armstrong numbers from given given arguments.
21) Write a shell script to display reverse numbers from given argument list
22) Write a shell script to display factorial value from given argument list
23) Write a shell script which will find maximum file size in the given argument list
24) Write a shell script which will greet you "Good Morning", "Good Afternoon", "Good Evening' and "Good Night" according to current time.
25) Write a shell script which will display total size of directories
26) Write a shell script to sort the elements in a array using bubble sort technique
27) Write a shell script to find largest element in a array
28) Write an awk program for display the lines in any file centre alignment
29) Write an awk program to print sum, avg of students marks list
30) Write an awk program to display total number of users and their names in unix system
31) Write an awk program to display students pass/fail report
32) Write an awk program to count the no. of vowels in a given file
33) Write an awk program which will find maximum word and its length in the given input File
34) Write a shell script to generate the mathematical tables.
35) Write a shell script to check whether given number is strong or not
36) Write a shell script to sort elements of given array by using selection sort.
37) Write a shell script to search given number using binary search.
38) Write a shell script to find number of vowels, consonants, numbers, white spaces and special characters in a given string.
39) Write a shell script to lock the terminal.
40) **Write a shell script which merge the contents of file1, file2, file3, sort them and display the sorted output on the screen page by page.**

MCA 308: <u>Seminar</u>

MCA 401: Principles of Programming Languages

UNIT – I

Introduction : What is a programming language, Abstractions in programming languages, Computational paradigms, Language definition, Language translation, Language design.

History : Early History : The first programmer, The 1950s : The first programming languages, The 1960s : An explosion in programming languages, The 1970s : Simplicity, abstraction, study, The 1980s : New directions and the rise of object –orientation, The 1990s : Consolidation, The Internet, libraries and scripting, The future.

Language Design Principles : History and design criteria, Efficiency, regularity, Further language design principles, C++ : A Case study in language design.

Syntax : Lexical structure of programming languages, Context-free grammars and BNFs, Parse trees and Abstract syntax trees, Ambiguity, Associativity and precedence, EBNFs and syntax diagrams, Parsing techniques and tools, Lexical vs Syntax vs Semantics.

Basic Semantics : Attributes, binding and semantic functions, Declarations, blocks and scope, The symbol table, Name resolution and overloading, Allocation, Lifetimes and the environment, Variables and Constants, Aliases, Dangling references and garbage.

Data Types : Data types and type information, Simple types, Type constructors, Type equivalence, Type Checking, Type conversion, Polymorphic type checking, Explicit polymorphism.

UNIT - II

Control – I : Expressions and Statements : Expressions, Conditional Statements and Guards, Loops and Variation on "while", The "goto" controversy, Exception handling.

Control – II : Procedures and Environments : Procedure definition and activation, Procedure semantics, Parameter passing mechanisms, Procedure environments, activations and allocation, Dynamic memory management, Exception handling and environments.

Abstract data types and Modules : The algebraic specification of abstract data types, Abstract data type mechanisms and modules, Separate compilation in C, C++ name spaces and Java packages, Ada packages, Modules in ML, Modules in earlier languages, Problems with abstract data type mechanisms, The mathematics of abstract data types.

UNIT - III

Object – Oriented Programming : Software reuse and independence, Java : objects, Classes and methods, Inheritance, Dynamic binding, C++, Small Talk, Design issues in object – oriented languages, Implementation issues in object – oriented languages.

Functional Programming : Programs as functions, Functional programming in an imperative language, Scheme : A Dialect of LISP, ML : Functional programming with static typing, Delayed Evaluation, Haskell – A fully curried lazy language with overloading, The Mathematics of functional programming I : Recursive functions, The Mathematics of functional programming II : Lambda calculus.

Logic Programming : Logic and Logic programs, Horn clauses, Resolution and Unification, The language Prolog, Problems with logic programming, Extending logic programming : Constraint logic programming and Equational systems.

UNIT - IV

Formal Semantics : A Sample small language, Operational semantics, Denotational semantics, Axiomatic semantics, Proofs of program corrections.

Parallel programming : Introduction to parallel processing, Parallel processing and programming languages, Threads, Semaphores, Monitors, Message passing, Parallelism in non-imperative languages.

Prescribed Book :

Kenneth C. Louden, "Programming Languages Principles and Practice", Second Edition, Cengage Learning (2008).

Chapters : 1 through 14

Reference Books:

1. Terrence W. Pratt & Mervin V. Zelkowitz, "Programming Languages Design and Implementation", Fourth Edition, Pearson Education (2008)

2. Robert W. Sebesta, "Concepts of Programming Languages", Seventh Edition, Pearson Education (2007)

MCA 402: Object Oriented Modeling and Design Using UML

Unit-I

Introduction: what is Object Orientation, What is OO Development, OO Themes, Evidence for Usefulness of OO Development.

Modeling as Design Technique: Modeling, Abstraction, Three Models

Class Modeling: Object and Class Concepts, Link and Association concepts, Generalization and Inheritance, A Sample Class Model.

Advanced Class Modeling: Advanced Object and Class Concepts, Association Ends, N-Ary Association, Aggregation, abstract Classes, Multiple Inheritance, Metadata, Reification, Constraints, Derived data, Packages.

Unit-II

State Modeling: Events, States, Transitions and Conditions, state diagrams, state diagram behavior.

Advanced State Modeling: Nested State Diagrams, Nested states, signal generalization, concurrency, A Sample State Model.

Interaction Modeling: Use Case Models, Sequence Models, Activity Models.

Advanced Interaction Modeling: Use Case Relationships, Procedural Sequence Models, Special Constructs for Activity Models.

Unit-III

Process Overview: Development Stages, Development Life Cycle.

System Conception: Devising a system Concept, Elaborating a Concept, Preparing a Problem Statement.

Domain Analysis: Overview of analysis, Domain Class Model, Domain State model, Domain Interaction Model, Iterating the Analysis.

Application Analysis: Application Interaction Model, Application Class Model, Application State Model, Adding Operations.

Unit-IV

System Design: Overview of system Design, Estimating Performance, Making a Reuse Plan, Breaking a System into Subsystem, Identifying Concurrency, Allocation of Subsystems, Management of data storage, Handling Global Resources, Choosing a Software Control Strategy, Handling Boundary Conditions, Setting Trade-off priorities, Common Architecture of ATM System.

Class Design: Overview of Class Design, Realizing Use Cases, Designing Algorithms, Recursing Downward, Refactoring, Design Optimization, Reification of Behavior, Adjustment of Inheritance, Organizing a class design.
Implementation Modeling: Overview of Implementation, Fine Tuning classes, fine tuning Generalization, Realizing Associations, Testing.

Programming Style: Object Oriented Style, Reusability, Robustness, Extensibility, Programming-in the Large.

Prescribed Book:

Michael Blaha, James Rumbaugh, "Object Oriented Modeling and Design with UML", Second Edition, PHI.

Chapters : 1.1 to 1.4, 2, 3.1 to 3.4,4, 5, 6.1 to 6.5, 7, 8, 10, 11, 12, 13, 14, 15, 17, 20

Reference Books:

1. Meilir Page-Jones, "Fundamentals of Object Oriented Design in UML", Pearson Education (2008).

3. Hans-Erik Eriksson, "UMLZ Took Kit", Wiley (2008).

4. Pascal Roques, "Modeling Software Systems Using UML2", Wiley (2008).

5. Simon Benett, Steve Mc Robb, "Object Oriented Systems Analysis and Design using UML", Second Edition, TMH (2007).

6. Mark Priestley, "Practical Object Oriented Design with UML", Second Edition, TMH (2008).

7. Grady Booch, James Rumbaugh "The Unified Modeling Language User Guide", Pearson (2008).

MCA 403: Web technologies

Unit-I:

Introduction: What is Internet, History of Internet, Internet services and accessibility, uses of the Internet, protocols, web concepts – the client/server model of the web, retrieving data from the web, How the web works?, web browsers, searching information on the web, Internet standards

Internet protocols: Introduction, Internet protocols – Internet protocol (IP), Transmission control protocol (TCP), User datagram protocol (UDP), host names, Internet applications and application protocols – Datagram Vs. Stream, Trivial file transfer protocol (TFTP), FTP – File Transfer Protocol, Telnet, HTTP (Hyper Text Transfer Protocol), e – mail protocols SMTP (Simple Mail Transfer Protocol), POP (Post Office Protocol, version 3),IMAP

Java network programming: Introduction, UDP/IP and TCP/IP communications, I/O streams – types of streams, character and byte streams, input stream, output stream, filter streams, readers and writers, data streams, object streams, sockets – creating client sockets, server socket, datagram socket, a simple example, Multicast sockets - multicast groups and addresses, a simple example, remote method invocation, protocol handler – developing a protocol handler, a simple protocol handler, content handlers – developing a content handler, a simple content handler, the "Grid Content Handler" class, the "Get Grid Application" program

Unit –II

HTML: Introduction, SGML – DTD, DTD elements, attributes, outline of an HTML document, head section – prologue, link, base, meta, script, style, body section – headers, paragraphs, text formatting, linking, internal linking, embedded images, lists, tables, frames, other special tags and characters, HTML forms

Java Script: Introduction – need of a scripting language, language elements – identifiers, expressions, java script keywords, operators, statements, functions, objects of a java script – the "window" object, the "Document" object, forms object, text boxes and text areas, buttons, radio buttons, check boxes, the "Select" object, other objects – the "date" object, the "math" object, the "string" object, regular expressions, arrays, worked examples

VB Script: Introduction, embedding VB script code in an HTML document, comments, variables – array variables, operators – assignment operator, numerical operators, string concatenation, procedures – sub procedure, function procedure, conditional statements, looping statements, object and VB script, cookies: cookie variables, creating a cookie, a cookie with multiple values, reading cookie value

Unit – III

Dynamic HTML (DHTML): Introduction, cascading style sheets (CSS) : coding css, properties of tags, property values, other style properties, in – line style sheets, Embedded style sheets, External Style Sheets, grouping, inheritance, class as selector, ID as selector, contextual selectors, pseudo classes and pseudo elements, positioning, backgrounds, element dimensions, DHTML document object model and collections – using the

collections "all", moving objects around the document, event handling – assigning event handlers, event bubbling, filters and transitions – filters, transitions, data binding – using tabular data control, sorting data, dynamic sorting, filtering

XML: Introduction, HTML vs. XML, syntax of XML document, XML attributes: use of elements vs. use of attributes, XML validation: "well formed" XML documents, "valid" XML documents, XML DTD: internal DTD, external DTD, the building blocks of XML documents, DTD elements: declaring an element, empty elements, elements with data, elements with children, wrapping, declaring only one occurrence of the same elements, declaring minimum one occurrence of the same element, defining zero or one occurrence of the same element, declaring mixed content, DTD attributes: declaring attributes, default attribute value, implied attribute, required attribute, fixed attribute value, enumerated attribute values, DTD entities, DTD validation, XSL, XSL transformation, XML namespaces, XML schema

Common Gateway Interface (CGI): Introduction, server - browser interaction, CGI script structure – the CGI .pm module, perl variables, CGI environment variables – processing forms – sending mail – validating the form data – handling check boxes – SSI - CGI server side and client side applets, CGI security issues

Unit – IV

Servlets: Introduction, advantages of servlets over CGI, installing servlets, the servlets life cycle, servlets API, a simple servlet, handling HTTP "Get" requests, handling HTTP "Post" requests, cookies, session tracking, multi tier applications using database connectivity, servlets chaining

Java Server Pages (JSP): Introduction, advantages of JSP, developing first JSP, components of JSP, reading request information, Retrieving the data posted from a HTML file to a JSP file, JSP sessions, cookies, disabling sessions

Active Server Pages (ASP): Introduction, advantages of ASP, first Asp script, processing ASP scripts with forms, variables and constructs, subroutines, Include/Virtual, ASP cookies, Asp objects, connecting to data with ASP

Prescribed book:

N.P Gopalan, J.Akilandeswari, "Web Technology – A Developer's Perspective", PHI (2008)

Chapters : 1 through 12

Reference Books:

1. Robert W. Sebesta, "Programming the World Wide Web", Third Edition, Pearson Education (2007).
2. Anders Moller and Michael schwartzbach, "An Introduction to XML and Web Technologies", Addison Wesley (2006)
3. Chris Bates, "Web Programming–Building Internet Applications", Second Edition, Wiley (2007).
4. Jeffrey C. Jackson, "Web Technologies – A Computer Science Perspective", Pearson Education (2008).

MCA 404 : Software Engineering

Unit-I:

Introduction to Software Engineering: The Evolving Role of Software, Software, The Changing Nature of Software, Legacy Software: The Quality of legacy software, Software Evolution, Software Myths.

A Generic View of Process: Software Engineering-A Layered Technology, A Process Frame Work, The capability Maturity Model Integration (CMMI), Process Patterns, Process Assessment, Personal and Team Process Models: Personal Software Process (PSP), Team Software Process (TSP), Process Technology, Product and Process.

Process Models: Prescriptive Models, The Waterfall Model, Incremental Process Models: The Incremental Model, The RAD Model, Evolutionary Process Model: Prototyping, The Spiral Model, The Concurrent Development Model, Specialized Process Models: Component Based Development, The formal Methods Model, The Unified Process.

An Agile View of Process: What is Agility? What is Agile Process? Agile Process Models: Extreme Programming, Adaptive Software Development, Dynamic Systems Development Method, Scrum, Crystal, Feature Driven Development, Agile Modeling.

Unit-II

Software Engineering Practice: Software Engineering Practice, communication practices, Planning Practices, Modeling Practices, Construction Practices, Deployment.

System Engineering: Computer Based Systems, The System Engineering Hierarchy, Business Process Engineering: An Overview, System Modeling.

Building the Analysis Model: Requirement Analysis, Analysis Modeling Approaches, Data Modeling Concepts, Object Oriented Analysis, Scenario Based Modeling, Flow Oriented Modeling, Class Based Modeling, Creating a Behavioral Model.

Design Engineering: Design within the context of Software Engineering, Design Process and Design Quality, Design Concepts, The Design Model, Pattern Based Software Design.

Unit-III

Testing Strategies: A strategic Approach to Software Testing, Strategic Issues, Test Strategies for conventional Software, Testing Strategies for Object Oriented Software, Validation Testing, System Testing, the Art of Debugging.

Testing Tactics: Software Testing Fundamentals, Black Box and White Box Testing, White Box Testing, Basis Path Testing, Control Structure Testing, Black Box Testing, Object Oriented Testing Methods, Testing Methods Applicable at the class level, InterClass Test

Case Design, Testing for Specialized Environments, Architectures and Applications, Testing Patterns.

Project Management: The Management Spectrum, The People, The Product, The Process, The Project, The W5HH Principles.

Metrics for Process and Projects: Metrics in the Process and Project Domains, Software Measurement¸ Metrics for Software Quality, Integrating Metrics within Software Process, Metrics for Small Organizations, Establishing a Software Metrics Program.

Unit-IV

Estimation: Observations on Estimations, The project planning process, Software Scope and Feasibility, Resources, Software Project Estimation, Decomposition Techniques, Empirical Estimation Models, Estimations for Object Oriented Projects, Specialized Estimation Techniques, The Make/Buy Decision

Quality Management: Quality Concepts, Software Quality Assurance, Software Reviews, Formal Technical Reviews, Formal Approaches to SQA, Statistical Software Quality Assurance, Software Reliability, The ISO 9000 Quality Standards, the SQA Plan

Formal Methods: Basic Concepts, Object Constraint Language (OCL), The Z specification language, The Ten Commandments for Formal Methods.

Cleanroom Software Engineering: The Cleanroom Approach, Functional Specification, Cleanroom Design, Cleanroom Testing.

Prescribed Book:
Roger S Pressman, "Software Engineering–A Practitioner's Approach", Sixth Edition, TMH International.

Chapters : 1,2,3,4,5,6,8,9,13,14,21,22,23,26,28,29

Reference Books:

1. Sommerville, "Software Engineering", Seventh Edition Pearson Education (2007)
2. S.A.Kelkar, "Software Engineering – A Concise Study", PHI.
3. Waman S.Jawadekar, "Software Engineering", TMH.
4. Ali Behforooz and Frederick J.Hudson, "Software Engineering Fundamentals", Oxford (2008).

MCA 405.1: Grid and Cluster Computing

Unit-I

Introduction : The Data Centre, the Grid and the Distributed / High Performance Computing, Cluster Computing and Grid Computing, Metacomputing – the Precursor of Grid Computing, Scientific, Business and e-Governance Grids, Web Services and Grid Computing, Business Computing and the Grid – a Potential Win – win Situation, e-Governance and the Grid.

Technologies and Architectures for Grid Computing : Clustering and Grid Computing, Issues in Data Grids, Key Functional Requirements in Grid Computing, Standards for Grid Computing, Recent Technological Trends in Large Data Grids

World Wide Grid Computing Activities, Organizations and Projects : Standard Origanizations, Organizations Developing Grid Computing Tool Kits, Framework, and Middleware, Grid Projects and Organizations Building and Using Grid Based Solutions, Commercial Organizations Building and Using Grid Based Solutions.

Unit-II

Web Services and the Service Oriented Architecture (SOA) : History and Background, Service Oriented Architecture, How a Web Service Works, SOAP and WSDL, Description, Creating Web Services, Server Side.

OGSA and WSRF: OGSA for Resource Distribution, Stateful Web Services in OGSA, WSRF (Web Services Resource Framework), Resource Approach to Stateful Services, WSRF Specification.

Globus Toolkit : History of Globus Toolkit, Versions of Globus Toolkit, Applications of GT4-Cases, GT4-Approaches and Benefits, Infrastructure Management, Monitoring and Discovery, Security, Data, Choreography and Coordination, Main Features of GT4 Functionality – a Summary, GT4 Architecture, GT4 Command Line Programs, GT4 Containers

The Grid and the Databases : Issues in Database Integration with the Grid, The Requirements of a Grid-enabled Database, Storage Request Broker (SRB), How to Integrate the Databases with the Grid?, The Architecture of OGSA-DAI for Offering Grid Database Services

Unit-III

What is Cluster Computing? : Approaches to Parallel Computing, How to Achieve Low Cost Parallel Computing through Clusters, Definition and Architecture of a Cluster, What is the Functionality a Cluster can Offer? Categories of Clusters

Cluster Middleware : An Introduction : Levels and Layers of Single System Image (SSI), Cluster Middleware Design Objectives, Resource Management and Scheduling, Cluster Programming Environment and Tools

Early Cluster Architectures and High Throughput Computing Clusters : Early Cluster Architectures, High Throughput Computing Clusters, Condor

Networking, Protocols & I/O for Clusters : Networks and Inter-connection/Switching Devices, Design Issues in Interconnection Networking/Switching, Design Architecture-General Principles and Trade-offs, HiPPI, ATM (Asynchronous Transmission Mode), Myrinet, Memory Channel (MC), Gigabit Ethernet

Unit-IV

Setting Up and Administering a Cluster : How to Set Up a Simple Cluster?, Design Considerations for the Front End of a Cluster, Setting Up Nodes, Clusters of Clusters or Metaclusters, System Monitoring, Directory Services Inside the Clusters & DCE, Global Clocks Sync, Administering Heterogeneous Clusters

Cluster Technology for High Availability : Highly Available Clusters, High Availability Parallel Computing, Mission Critical (or Business Critical or Business Continuity) Applications, Types of Failures and Errors, Cluster Architectures and Configurations for High Availability, Faults and Error Detection, Failure Recovery, Failover/Recovery Clusters

Load Sharing and Load Balancing : Load Sharing and Load Balancing, Strategies for Load Balancing, Modelling Parameters

Distributed Shared Memory : Issues in DSM, Write Synchroni- zation for Data Consistency, Double Faulting, Application/Type Specific Consistency, Issues in Network Performance in DSM

Prescribed Book:

C.S.R.Prabhu – "Grid and Cluster Computing"-PHI(2008)

Chapters: 1 to 13, 16, 17.

Reference Book:

Jankiram, "Grid Computing Models : A Research Monograph", TMH (2005)

MCA 405.2: Cryptography and Network Security

Unit-I

Introduction: Security trends, the OSI security architecture, security attacks, security services, security mechanisms, a model for network security.

Classical encryption techniques: Symmetric cipher model,Substitution techniques, Transposition techniques, Rotor machines, Steganography.

Block cipher and the data encryption standard: Blockcipher principles, the strength of DES, Differential and linear cryptanalysis, Block cipher design principles.

Confidentiality using Symmetric Encryption: Placement of encryption function, Traffic confidentiality, key distribution, random number generator.

UNIT-II

Public key cryptography and RSA: Principles of public key crypto systems, The RSA algorithm

Key management:Other public-key crypto systems: Key management, Diffie-Hellman key exchange.

Message authentication and hash functions: Authentication requirements, Authentication functions, message authentication codes, Hash functions, security of hash functions and MACs.

Digital signatures and authentication protocols: Digital signatures, Authentication protocols, Digital Signature standard.

UNIT-III

Authentication Applications: Kerberos, X.509 authentication service

Email Security: Pretty good privacy, S/MIME

IP security: IP security overview, IP security architecture, Authentication header, Encapsulating security payload, combining security associations, key management.

Web security: Web security considerations, Secure Socket Layer and transport layer security, Secure electronic transaction.

UNIT-IV

Intruders: Intruders, Intrusion detection, password management

Malicious Software: Viruses and related threads, virus counter measures, distributed denial of service attacks.
Firewalls: Firewall Design principles, trusted systems, common criteria for information technology, security evaluation.

Prescribed Book:

William Stallings, "Cryptography and Network Security",
Fourth edition, PHI.

Chapters : 1,2,3,7,9,10,11,13,14,15,16,17,18,19,20

Reference Books:

1. William Stallings, "Network Security Essentials – Applications and Standards", Third Edition, Pearson Education (2007).

2. Chris McNab, "Network Security Assessment", 2nd Edition, OReilly (2007).

3. Jon Erickson, "Hacking – The Art of Exploitation", SPD, NOSTARCH Press (2006).

4. Neal Krawety, "Introduction to Network Security", Thomson (2007).

5. Ankit Fadia, "Network Security – A Hackers Perspective", Macmillan (2008)

MCA 405.3: Simulation Modeling And Analysis

UNIT I:

Basic simulation Modeling: Systems , models and simulation , Discrete-Event simulation , Simulation of an inventory system , Problem statements, program organization and Logic, C program, simulation output and discussion, Steps in a Sound Simulation Study
Other types of simulation: Continuous simulation, Combined Discrete continuous simulations, Monte Carlo Simulation, Spreadsheet simulation, Advantages , disadvantages and Pitfalls of Simulation

UNIT II:

Modeling Complex Systems: Introduction, List Processing in Simulation, A simple Simulation Language: simlib, Single Server Queueing Simulation with simlib, Time-Shared Computer Model, Multiteller Bank with Jockeying, Job-Shop Model, Efficient Event List Manipulation.

UNIT III:

Simulation Software: Introduction, Comparison of simulation packages with Programming languages , Classification of Simulation Software. General purpose versus Application Oriented Simulation Packages, Modeling Approaches, Common Modeling Elements, Desirable Software features, General Capabilities, Statistical capabilities, Customer support and documentation, Object-Oriented Simulation.

UNIT IV:

Random-Number Generators: Introduction, Linear Congruential generators , Mixed generators, Multiplicative generators, Composite generators, Empirical Tests, Theoretical tests,
Generating random variates: General approaches to generating random variates, Inverse Transform, Acceptance –Rejection , Generating continuous Random variates, Uniform , Exponential, weibull and normal.

Prescribed Book:

Averill M Law, "Simulation Modeling and Analysis", Fourth Edition, TMH (2008)

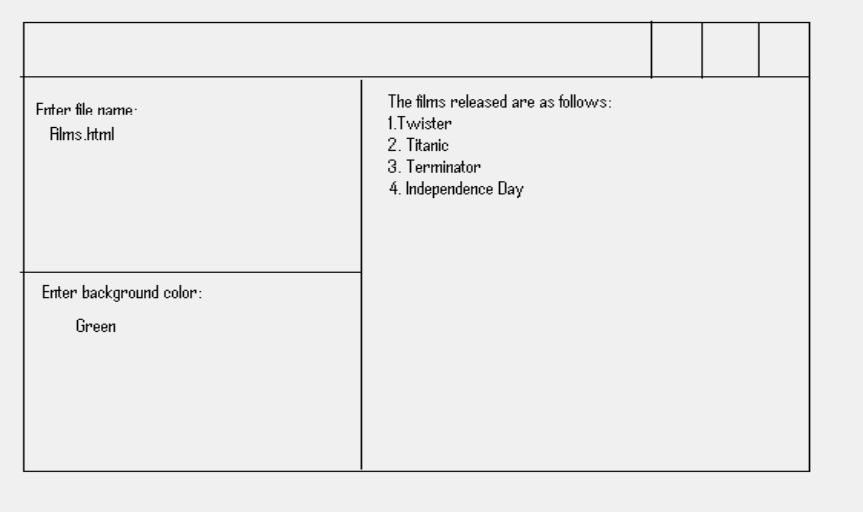
Chapters: 1, 2, 3, 7, 8

Reference Book :

Jerry Banks, John S.Carson And Berry L. Nelson & David M. Nicol, "Discrete Event System Simulation", 3rd Edition, Pearson Education

MCA 406 : Web Technologies Lab

1. Write HTML code to provide intra document linking.
2. Insert the "Calendar" object in a web page.
3. Create a form with the following specifications:
    a) Our form uses frames, one to hold the links bar at the op of the browser window.
    b) Other is a larger frame that provides the main view.
    c) The links bar should contain 5 links, which when clicked, should display the appropriate HTML file in the larger frame.
4. Simulate the "notepad" help file in HTML.
5. Write a Java script to differentiate between write() and writeln() methods. Also, depict how <H1> tag in a Java script influence the output, while a <pre> tag is also attached to the script.
6. Find the difference in hours between local time and Greenwich Mean Time using the 'Date' object in Java Script.
7. Create a bank entry form using appropriate form elements. The account number must not be visible on the screen. The name and address must be stored in one place. There must be a text box showing the opening balance of the customer. The user should be able to make a choice of either a deposit (or) withdrawal transaction. Accordingly, when the user deposits (or) withdraws money, the opening balance must be updated using CREDIT/DEBIT button. The user should not be able to make any entries in the opening balance text box.
8. Write a Java Script to update the information into the array, in the "onClick" event of the button "Update".
9. Create forms for the objects "stu_info","College" and "Experience". Place textboxes for all the fields in the form "stu_info". Create two tables for storing data for the "college" and "experience" forms and place textboxes for all the fields in a three row format. Place two buttons "update" and "retrieve" in the form "execute".
10. Create a web page for a shopping mall that allows the user to tick off his purchases and obtain the bill with the total being added up simultaneously.
11. Use the suitable date functions to prompt the user for an integer between 1-31 and return the day of the week it represents.
12. Write a script to find the duplicate elements of an array.
13. Write validation functions for checking the alphabetic and number fields.
14. Using the concept of "Nested Frames", obtain the output as follows:



The right hand frame must display the output of the file, that is entered in the top-left frame. The bottom left-hand frame displays the selected background color.

15. Create a home page for "Cyber book stores" that will display the various books available, the authors and prices pf the books. Include a list box that contains various subjects and a "submit" button, that displays information about the books on the subject required by the user.
16. Create a HTML form that interacts with the user. Collect first name, last name and date of birth and display that information back to the user.
17. Write a script which generates a different greeting each time the script is executed.
18. Write a script that takes input from user and displays the same in upper case.
19. Illustrate different types of filters on a sample text.
20. Create an inline style sheet.
21. Illustrate the use of an embedded style sheet.
22. Create an external style sheet to illustrate the "Font" elements.
23. Create a file with HTML code and insert two anchors to point to a specific area in the code.
24. Illustrate the creation of clickable images in HTML.
25. With a suitable example, depict how we can align text and images using "table" tag.
26. Simulate the "Clip Art" gallery of M.S.Word in HTML, using suitable tags.
27. Using functions, write a Java Script code that accepts user name and password from user. Check their correctness and display appropriate alert messages. Restrict the user to try only for a maximum of three times.
28. Modify the above program that suits the following requirements:
    a) After a lapse of 15 seconds, the password should be generated automatically.
    b) For impatient users, place a button that displays the passwords immediately without waiting for 15 seconds.
29. Write a script to open a new window, after clicking a button named "New". After displaying the new window, the original window should be closed automatically.

Write an application to create a "customer interaction form", that accepts the name, age and salary of a customer who approaches the bank to obtain education loan for their children. He should furnish details about his marital status and children. Accept this information in textboxes and two check boxes. Display whether the customer is eligible for the loan (or) not, based on the furnished information.

MCA 407 : Visual Programming Lab

1. Develop an Visual Basic Application to display the Profile of a Valid User.

Conditions:

   i. Check the User with his User Name and Pass Word.
   ii. Display the Profile of the User. (Note: Profile of the user will be any of "READ", "WRITE" and "READ AND WRITE"

2. Develop an Visual Basic Application to search an item from list of items using Binary Search.

3. Develop an Visual Basic Application to demonstrate the Stack Operations.

4. Develop an Visual Basic Application to demonstrate the Queue Operations.

5. Develop an Visual Basic Application to check the given string is palindrome or not.

6. Develop an Visual Basic Application to find out the factorial of the given number by using functions

7. Develop an Visual Basic Application to Check the given number in one of categories like
   i. Strong Number.
   ii. Perfect Number.
   iii. Palindrome.

(Note: Use Sub Program Concept)

8. Develop an Visual Basic Application for copying the elements from one list to the other list and Vice-versa. (Note: Implement Single Element, Multiple Element Transfer between the lists)

9. Develop an Visual Basic Application to implement the Calculator operations by using Control Array.

10. Develop an Visual Basic Application to Implement the Traffic Signal Operations by using the following conditions

   i. Three Traffic Signal named "RED", "GREEN" and "YELLOW"
   ii. Signal Flow should be RED->YELLOW->GREEN.
   iii. Time Out for Red signal is 10, Green signal is 10 and Yellow signal is 5.
   iv. Always Yellow Signal follows either Red or Green.
   v. Red and Green Signals will not appear one by one.

11. Develop an Visual Basic Application to sort the given list of numbers. (D't use the Sort option of the List Control)

12. Develop an Visual Basic Application to read and Print the user data by using Input Box and Message Box.

13. Develop an Visual Basic Application to Read the Details of the Candidate using following Conditions

i. Read the Name, Father Name, Address, Qualifications and respective percentages and Experience if any.
ii. Candidate may choose any TWO OS Types (MAX)
iii. Candidate may Choose any THREE Database (MAX)
iv. Candidate may choose any FIVE Programming Languages (MAX)

(Note: No Control in the Form will be NULL)

14. Develop an Visual Basic Application to generate the Telephone Bill.

15. Develop a Visual Basic Application to make survey on different age groups.

Example:
Age groups may be (25-34), (35-44), (45-54) and >=55 and display the no of people on a particular age group.

16. Develop an Visual Basic Application to implement the Arithmetic operations.

i. Project Consists of Four Forms
ii. Form1 is used to Read the numbers and read the operation.
iii. Operations are partitioned into two categories like Integer Arithmetic and Real Arithmetic should follow the normalization principles.
iv. Choose the appropriate arithmetic operation under Integer and Real arithmetic under Addition, Subtraction, Multiplication and Division.
v. Form2 is for doing Integer Arithmetic and Form3 is for doing Real Arithmetic.
vi. Form 4 is for Display the result.

17. Develop an Visual Basic Application to make the following database operations by using ADO,

i. Insert an New Employee into the database.
ii. Delete an Existing Employee from the database.
iii. Update the employee information on the basis of Employee number.
iv. Search an employee details on the basis of department number.

18. Develop an Visual Basic Application to make the following operations on Employee database.

i. Search an Employee on the basis of Employee number.

ii. Navigate and display the records on MOVE FIRST, MOVE NEXT, MOVE PREVIOUS, MOVE LAST.

19. Develop an Visual Database application by using Data Environment and PL/SQL procedures.

i. Insert the employee details into the database by using PL/SQL Procedure.

ii. Update the employee information in basis of employee number by using PL/SQL procedure.

iii. Delete a employee information in basis of employee number by using PL/SQL procedure.

iv. Generate a report for

a. Recently joined employees

b. Department wise and in the order of experience.

c. Complete Employee Details.

20. Develop an Database application for Telephone Billing System.

MCA 408 : Soft Skills

Prescribed Books :

1. Wallace, Masters, "Personality Development", Cengage Learning (2008).
2. Edgar Thorpe, Showick Thorpe, "Winning at Interviews", Second Edition, Pearson Education (2007).

Reference Books :

1. Peter Urs Bender, Dr. Robert A. Tracz, "Secrets of Face to Face Communication", Macmillan (2007).
2. Deepika Nelson, "Essential Key for Corporate Threshold", BS Publications (2008).

MCA 501 : Data Warehousing And Data Mining

Unit – I

Warehouse: What is it, Who Need It, and Why?, Things to Consider, Managing the Data Warehouse, Data Warehouse Design Methodology, Data Marts and Start Schema Design, Fundamentals of ETL Architecture, Partitioning Data, Indexing Data.

Unit – II

Data mining – Introduction, Data mining on what kind of data , Data mining functionalities classification of Data mining systems, Major issues in Data mining

Mining Association rules in large databases - Association rule mining, Mining single-Dimensional Boolean association rules from Transactional databases, Mining multi-Dimensional Association rules from relational Databases and Data Warehouses

Unit – III

Classification and Prediction - Introduction classification by decision tree induction, Bayesian Classification. Other classification methods, classification by back propagation, Prediction, classifier accuracy

Unit – IV

Cluster analysis – Introduction types of data in cluster analysis a categorization of major clustering methods portioning methods, hierarchical methods, Density based methods,: DBSCAN, Grid-based method : STRING , Model based clustering method: Statistical Approach, outlier analysis.

Prescribed Books :

1. Michael Corey, Michael Abbey, Ian Abramson, Ben Taub, "Oracle 8i Data Warehousing", TMH (For Unit-I).

2. Jiawei Han Micheline Kamber, "Data mining & Techniques", Morgan Kaufmann Publishers (Unit-II to IV).

Reference Books :

1 S.N.Sivanandam, S.Sumathi, "Data Mining – Concepts, Tasks and Techniques", Thomson (2006).
2 Ralph Kimball, "The Data Warehousing Toolkit", Wiley.
3 Margaret H. Dunham, "Data mining - Introductory and advanced topics",Pearson Education.
4 D.Hand, H. Mannila and P.Smyth, "Principles of Data mining", PHI (2001).

MCA 502 : .NET Programming

UNIT-I: Visual basic 2005:

Getting started with Visual Basic 2005: Arithmetic Operators, Data type, Statements, Control Statements, Loops, Arrays, Structures,Val and Structure functions, Creating Visual studio Applications, Saving Visual Basic 2005 Application.

Object Oriented Programming: Basic Principles of Object Oriented Programming, Member Access Modifiers, Define Class, Creating Objects, Constructors, Inheritance, Abstract Classes, Interfaces, Polymorphism

Windows Forms: Introduction to the windows forms, Setting the title Bar Text, Minimizing and Maximizing a form, Setting initial position of a form, Working with multiple forms, Creating adding controls to a form, Setting controls Tab order, Naming Controls, Setting Properties at design time, Setting properties at run time, Creating a message box, Creating a Input box, Creating MDI Applications, Creating Dialog box, Commenting the code

Label, TextBox, Button, ComboBox and ListBox Controls: Label Control, Button Control, ComboBox Control, ListBox Control, Project

Panel, PictureBox, Progress Bar and Timer Controls: Panel Control, Picture box Control, Progress Bar Control, Timer Control, Project

Checkbox, radio button, and group box controls : Checkbox control, Radio button control, Progress bar control, Timer control, Project.

Menus, built-in dialog box, printing and tree view controls: Menus, Folder Browser Dialog Control, Open File Dialog Control Save File Dialog Control, Font File Dialog Control, Color File Dialog Control, Print Document Control, Tree View Control, Project

Mouse Events and Keyboard Events: Mouse Events, Keyboard Events

Handling Errors and Exceptions: Errors, Exceptions

UNIT-II : ASP.NET 2.0

ASP.NET 2.0 Essentials: Introduction to Asp.NET, Benefits of Asp.NET, What's new Asp.NET?, Introduction Asp.NET 2.0 IDE

Developing a Web Application :HTML, DHTML, PHP, JSP, PERL, ASP.NET 2.0 Provider Model, ASP.NET 2.0 Coding Model, Code Sharing, Compilation in ASP.NET

Standard Controls: Introduction to standard controls, Label Control, TextBox Control, Button Control, Image Button Control ListBox Control, Radio Button Control

Navigation Controls: Introduction to Navigation Controls, Site Map Path Controls, Menu Controls, Tree View Controls.
Validation Controls: Introduction to validation control, Base validator class, Required field validator control, Range validator control, Regular Expression validator control, Compare validator control, Custom validator control, Validation summary control

Login controls: Introduction to login controls, Login control Login view control, Login name control, Login status control Password recovery control

Master pages and Themes: Need for Master Pages and Themes, Creating a Simple Master Page, Creating a Nested Master Page Themes, Creating Themes, Applying Themes on controls at Run time

UNIT-III: C# 2005

Introduction to Visual C# 2005: Introduction, Features of Visual C# 2005, Creating Visual C# 2005, Key words, Identifiers, Data Types, Variables, Scope of Variables, Constants, Operators
Operator Precedence and Associativity, Expressions, Punctuators Control Statements, Loops, Interrupting Loops using Jump Statements, Creating Arrays, Creating Enumerations, Creating
Structures, Methods

Object Oriented Programming : Basic Principles of Object Oriented Programming, Member Access Modifiers, Defining a Class, Creating Objects, Constructors, Static Members, Inheritance, Abstract Class, Interfaces, Polymorphism, Operator Overloading

Windows Forms : Introduction to Windows form, Setting the title bar Text, Minimizing or Maximizing a forms, Working with multiple Forms, Setting the startup form, Adding controls to a form, Setting controls Tab order, Setting properties at Design time, Setting properties at Run time, Showing and Hiding controls and Forms, Creating a message box, Commenting the code, Handling Events.

Label, TextBox, Button, ComboBox and ListBox Controls: Label Control, TextBox Control, Button Control, ComboBox Control ListBox Control, Project

Panel, PictureBox, Progress Bar and Timer Controls: Panel Control, Picture box Control, Progress bar Control, Timer Control Project

Checkbox, Radio button and Group box controls : Checkbox control, Radio button control,GroupBox Control, Project

Menus, built-in dialog box, printing and tree view controls: Menus, Folder Browser Dialog Control, Open File Dialog Control Save File Dialog Control, Font File Dialog Control, Color File Dialog Control, Print Document Control, Tree View Control, Project

Mouse Events and Keyboard Events: Mouse Events, Keyboard Events

Handling Errors and Exceptions: Errors, Exceptions

UNIT-IV : ADO.Net & Data Binding :

Accessing Data using ADO.NET (C# 2005): What are Databases? Basic SQL Statements, Working with ADO.NET, Overview of ADO.NET
Objects Data Grid View Control, Accessing Data using Server Explorer, Creating a new data connection, Accessing data using data adaptors and data sets, Previewing data from data adaptors Connecting to an MS Jet database

Data Binding(C# 2005): Introduction, Simple Data Binding, Complex Data Binding, Implementing Data Binding, Project

Working with Databases (ASP.NET 2.0): What are Databases?, Working with ADO.NET, Overview of ADO.NET Objects, Basic SQL statements, ASP.NET 2.0 data display controls, ASP.NET 2.0 data source controls, Accessing data with server explorer, Creating a web applications using data display controls

Accessing data using ADO.NET (Visual Basic 2005): What are Databases?, Basic SQL statements, Working with ADO.NET, Overview of ADO.NET objects, Data Grid View Control, Accessing data using server explorer, Creating a new data connection, Accessing data using Data Adapters and Datasets, Previewing data from Data Adapters, Connecting to an MS Jet database .

Data Binding (Visual Basic 2005): Introduction, Simple Data Binding, Complex Data Binding, Implementing Data Binding, Project

Prescribed Book:

Vikas Gupta, ".Net Programming", Dream Tech (2008).

Chapters :

UNIT – I - 1 to 8, 11 chapters in Visual Basic 2005
UNIT – II – 1 to 7, 9 chapters in ASP.NET 2.0
UNIT – III – 1 to 8, 11 chapters in C# 2005
UNIT – IV – 9, 10 chapters in Visual Basic 2005 8 chapter in ASP.NET 2.0 9, 10 chapters in C# 2005

Reference Books:

1. Xue Bai, Michael Ekedah, "The Web Warrior Guide to Web Programming", Thomson (2006).
2. Kogent Solutions Inc.,".Net Programming", Black Book, Dream Tech (2008).
3. Joe Duffy, "Professional.Net Programming 2.0", Wiley.
4. George Stepherd, "ASP.NET 3.5 Microsoft", PHI (2008).

MCA 503: Design and Analysis of Algorithms

Unit-I

Introduction : What is Algorithm – Algorithm Specification : Pseudocode Conventions – Recursive Algorithms ; Performance Analysis: Space Complexity – Time Complexity – Asymptotic notation – Performance Measurement; Randomized Algorithms : Basics of probability theory – Randomized algorithms – Identifying the repeated element, Primality Testing – Advantages and Disadvantages.

Elementary Data Structures: Stacks and Queues ; Trees : Terminology – Binary Trees ; Dictionaries : Binary Search Trees ; Priority Queues : Heaps – Heapsort ; Sets and disjoint set Union : Introduction – union and find operations. ; Graphs: Introduction – Definitions – Graph Representations.

Divide – and – conquer: General Method – Defective Chess Board – Binary Search – Finding Maximum and Minimum – Merge Sort – Quick sort – Selection Problem ; Strassen's Matrix Multiplication, Convex Hull: some geometric Primitives – The Quick Hull Algorithm – Graham's scan – An o(nlogn) divide – and – conquer algorithm.

Unit–II

The Greedy Method : The general Method – Container loading – Knapsack Problem – Tree Vertex Splitting – Job sequencing with deadlines ; Minimum cost spanning trees : Prim's Algorithm – Kruskal's Algorithm – Optimal Storage on tapes – Optimal Merge patterns – Single Source shortest paths.

Dynamic Programming : The general method – Multi-stage graphs – All pairs shortest paths – Single source shortest paths – Optimal Binary Search Trees – String editing – 0/1 Knapsack – Reliability design – The traveling sales person problem – Flow shop Scheduling

Unit–III

Basic Traversal and Search Techniques: Techniques for Binary Trees – Techniques for graphs : Breadth First Search and Traversal – Depth First Search ; Connected Components and Spanning Trees – Bi-connected components and DFS

Back Tracking : The general method – The 8-queens problem – sum of subsets – Graph coloring – Hamiltonian Cycles – Knapsack Problem .

Unit–IV

Branch and Bound : The Method: Least Cost search – The 15 puzzle – control abstractions for LC search – Bounding – FIFO Branch – and –Bound – LC Branch and Bound; 0/1 knapsack problem: LC Branch and Bound solution – FIFO Branch and Bound solution; Traveling Sales person.

NP-Hard and NP – complex problems : Basic concepts : Non deter- ministic algorithms – The classes NP hard and NP complex ; Cook's theorem – NP hard graph problems : Clique Decision Problem – Node cover decision problem – chromatic number decision problem – Directed Hamiltonian cycle – Traveling sales person decision problem – and/or graph decision problem; NP-hard scheduling Problems: scheduling identical processors – flow shop scheduling – jop shop scheduling; NP-hard code generation problems:code generation with common subexpressions – Implementing parallel assignment instructions; Some simplified NP-hard problems.

Prescribed Book:

Sartaj Sahni,"Fundamentals of Computer Algorithms", Second Edition, Universities Press (2008)

Chapters : 1 to 8 and 11

Reference Books :

1. Anany Levitin, "Introduction to the Design & Analysis of Algorithms", Second Edition, Pearson Education (2007).

2. I.Chandra Mohan, "Design and Analysis of Algorithms", PHI.

3. Prabhakar Gupta, Vineet Agrawarl, "Design and Analysis of Algorithms", PHI.

4. Parag Himanshu Dave, "Design and Analysis of Algorithms", Pearson Education (2008)

MCA 504.1 Embedded Systems

Unit I

Introduction.: Embedded system overview,Design challenges,Processor technology.,IC technology,Design technology,Trade offs.

Custom single purpose processors: Hardware: Introduction, Combinational logic, Sequential logic, Custom single purpose processor design,RT-level custom single purpose processor design, Optimizing custom single purpose processor design.

Unit II

General purpose processors : Software : Introduction, Basic architecture, Operation, Programmer's view, Development environment, Application specific instruction set processors, Selecting a microprocessor, General purpose processor design

Standard single purpose processors: Peripherals: Introduction, Timers, Counters, Watchdog timers, UART, Pulse width modulators, LCD controllers, Keypad controllers, Stepper motor controller, Analog to digital converters, Real time clocks.

Unit III

Memory: Introduction, Memory write ability and storage permanence, Common memory types, Composing memory, Advanced RAM

Interfacing: Introduction, Communication basics, Microprocessor interfacing –I/O addressing, Microprocessor interfacing – Interrupts, Microprocessor interfacing – DMA, Arbitration, Multi level bus architectures, Advanced communication principles, Serial protocols, Parallel protocols, Wire less protocols

Unit IV

Digital camera example: Introduction, Introduction to simple digital camera, Requirements specifications, Design

State machine and concurrent process models: Introduction, Models Vs languages, text Vs graphics, An introductory example, A basic state machine model-FSM, Finite state machine with data path model-FSMD, Using state machine, HCFSM and stack charts languages, Program state machine model –PSM, The role an appropriate model and language, Concurrent process model, Concurrent processes, Communication among the processes, Synchronization among the processes, Implementation, Data flow model, Real time systems

Prescribed Book:
Frank Vahid / Tony Givargis, "Embedded System Design", Third edition, Wiley (2008).
Chapters : 1 to 8.

Reference book:
Raj Kamal, "Embedded Systems", Second Edition, TMH (2008).

MCA 504.2: Mobile Computing

Unit – I

Introduction: Mobility of bits and bytes, Wireless – the beginning, mobile computing, dialogue control, networks, middleware and gateways, applications and services, developing mobile computing applications, security in mobile computing, standards – why is it necessary, standard bodies, players in the wireless space

Mobile computing architecture: History of computers, history of Internet, Internet – ubiquitous network, Architecture of mobile computing, three tier architecture, design considerations for mobile computing, mobile computing through Internet, making existing applications mobile – enabled

Mobile computing through telephony: Evolution of telephony, multiple access procedure, mobile computing through telephone, developing an IVR application, voice XML, telephony application programming interface (TAPI)

Unit – II

Emerging technologies: Introduction, Bluetooth, radio frequency identification {RFid}, wireless broadband {WiMAX}, mobile IP, Internet protocol version 6 {IPv6}, java card

Global system for mobile communications (GSM): Global system for mobile communications, GSM Architecture, GSM Entities, Call routing in GSM, PLMN Interfaces, GSM Addresses and identifiers, network aspects in GSM, GSM frequency allocation, Authentication and security

Short message service (SMS): Mobile computing over SMS, short message services (SMS), value added services through SMS, accessing SMS bearer

Unit – III

General packet radio service (GPRS): Introduction, GPRS and packet data network, GPRS network architecture, GPRS network operations, data services in GPRS, applications for GPRS, limitations of GPRS, billing and charging in GPRS

Wireless application protocol (WAP): Introduction, WAP, MMS, GPRS applications

CDMA and 3G: Introduction, spread – spectrum technology, Is – 95, CDMA Vs GSM, wireless data, third generation networks, applications on 3G

Unit –IV

Wireless LAN: Introduction, wireless LAN advantages, IEEE 802.11 standards, wireless LAN Architecture, mobility in wireless LAN, deploying wireless LAN, mobile Ad Hoc networks and sensor networks, wireless LAN security, Wi- Fi vs. 3G

Voice over Internet protocol and convergence: Voice over IP, H.323 frame work for voice over IP, Session initiation protocol (SIP),comparison between H.323 and SIP, real time protocols, convergence technologies, call routing, voice over IP applications, IP Multi media subsystem (IMS), mobile VoIP

Security issues in mobile computing: Introduction, information security, security techniques and algorithms, security protocols, public key infrastructure, trust, security models, security frameworks for mobile environment

Prescribed Book:

Asoke K Talukder and Roopa R Yavagal, "**Mobile Computing**" TMH (2008)

Chapters: 1 to 10, 17,18.

Reference Book :

Rajkamal, "Mobile Computing", Oxford (2008).

MCA 504.3 Software Testing Techniques

UNIT : I

The Testing Challenge and Those Who Take It On : Software Engineering Evolution, A Tester's True Goal, What is a User, Testers, What Makes Them Special

Industrial –strength Software, It's Not a Science Project : Industrial-strength Software, Production Environments, Mission-critical Software, Case Study :A Pension Plan Management Vendor

The Development Process : Test Process Definitions

The Test and Development Divide : Should Developers Test Their Own Software, Diplomacy : The Tester's Relationship with Development

UNIT : II

Where to Start ? Snooping for Information : The Importance of Knowing What You Test, Viewing All Software as a Solution to a Problem, Customer Reconnaissance, A Simple Test Preparation Tool, Don't Just Take, Give a Little

Coping with Complexity through Teaming : Complex Software Products : You Can't Know It All, Reducing Complexity through Component Spies, Sharing Expertise Across the Team.

Test Plan Focus Areas : The Test Plan Document, Unit Test Focus Areas, Function Verification Test Focus Areas, System Verification Test Focus Areas, Integration Test Focus Areas, Single-system versus Multisystem Testing, Test Plan Reviews

Testing for Recoverability : Function Verification Test, System Verification Test, Integration Test, Case Study : Clustered System Recovery

UNIT : III

Planning for Trouble : Scheduling, Entry and Exit Criteria, Injecting Testability into Development Plans, Case Study : The Testability of Errors

The Magic of Reuse : Who Writes More Code : Development or Test, Reuse Opportunities and Techniques, Case Study : Testing Real Memory Management

Developing Good Test Programs : Function Verification Test Programs, System Verification Test Programs, Case Study : Termination Processing

Data Corruption : Data Integrity : What is it, Protecting against Data Corruption, The Need for Special Testing, Data Integrity Monitors, Case Study : Memory and File Thrashers

UNIT : IV

Tools-You Can't Build a House without Them: The Magic Tool Myth, Tool Categories, Buy versus Build, Avoid the Tool Merry-Go-Round

Test Execution: Test Execution Sequence, Artistic Testing, An Iterative Approach: Algorithm Verification Testing, Catching Problems, Problem Diagnosis, Testing the Documentation

Testing with a Virtual Computer: Partitioning, Virtualization, Partitioning and Virtualization Combinations, Why Go Virtual

The Customer's Role in Testing: Controlled Early Introduction Programs, Preproduction Testing

Prescribed Book:

Loveland, Miller, Prewitt, Shannon, "Software Testing Techniques – Finding the Defects that Matter", SPD, Charles River Media (2007)

Chapters: 1 to 13, 15, 16, 19

Reference Book :

1 Rajini & Oak, "Software Testing : Methodologies, Tools and Processes", TMH (2004)

2 Dortothy Graham, "Foundations of Software Testing : ISTQB Certification", Thomson (2007)

3 Srinivasan Desikan, Gopalaswamy Ramesh: "Software Testing", Pearson Education.

MCA 505.1 Image Processing

UNIT I:

Introduction, Image Shape, Human Vision System, Image Acquisition – Intensity Images, Real Time Capture, Colour Images, Video Camera, Capture, Analogue To Digital Conversion, Scanners, Character Recognitions Devices, Satellite Imaginary, Ranging Devices, Calibration, Image Presentation-Raster Screen, Printers (Matrix, Laser, Ink-Jet, Wax Thermal),Patterns, Dithering, Three-Dimensional Image.

UNIT II:

Statistical Operations-Introduction, Gray-Level Transformations, Histogram Equalization, Multi-Image Operations, Spatial Operations And Transformations-Introduction, Spatial Dependent Transformations, Templates And Convolution, Edge Detection, Other Window Operations, Two-Dimensional Geometric Transformations, Segmentation And Edge Detection-Introduction, Region Operations, Basic Edge Detection, Second-Order Edge Detection, Pyramid Edge Detection, Crack Edge Relaxation.

UNIT III:

Morphological And Other Area Operations-Introduction, Basic Morphological Operations, Opening And Closing Operations, Finding Basic Shapes-Combining Edges, Hough Transforms, Bresenhams Algorithms; Labeling Lines And Regions-Flat Surface And Straight Line Labeling, Dealing With Curves, Labeling Regions.

UNIT IV:

Frequency Domain-Introduction, Hartley Transform, Fourier Transform, Optical Transformation, Power And Autocorrelation Functions; Image Compression-Introduction, Types And Requirements, Statistical Compression, Spatial Compression, Contour Coding, Quantizing Compression , Real-Tme Image Transmission, Quadtrees; Texture-Introduction, Identifying Textures, Texture Gradient, Texture Segmentation.

Prescribed Book

Introductory Computer Vision And Image Processing – Adrian Low:, MC Graw Hill International Editions

Reference Book

Digital Image Processing – Gojelez – Addison Wesley.

1. B.Chanda, D.Dutta Majunder, "Digital Image Processing", PHI (2008).

MCA 505.2: Microprocessors And Interfacing

UNIT - I

Introduction : Overview of Microcomputer Systems**:** Hardware – Software, Addresses – General Operation of a Computer – Microprocessors in Digital System Design.

8086 Architecture: CPU Architecture – Internal Operation , Machine Language Instruction: Addressing modes – Instruction Formats.

Assembler Language Programming: Assembler Instruction Format – Data Transfer Instructions , Arithmetic Instructions: Binary Arithmetic – Packed BCD Arithmetic – Unpacked BCD Arithmetic, Branch Instructions: Conditional Branch Instructions - Unconditional Branch Instructions, Loop Instructions – NOP and HLT Instructions – Flag Manipulation Instructions – Logical Instructions – Shift and Rotate Instructions , Directives and Operators: Data Definition and Storage allocation – Structures – Records – Assigning Names to Expressions – Segment Definitions – Program Termination – Alignment Directives – Value returning attribute operators.

UNIT - II

Modular Programming: Linking and Relocation: Segment Combination – Access to External Identifiers, Stacks , Procedures: calls, returns, and Procedure Definitions – Saving and Restoring Registers – Procedure Communication – Recursive Procedures, Interrupts and Interrupt Routines, Macros: ASM-86 Macro Facilities – Local Labels – Nested Macros – Controlled Expansion and Other Functions.

I/O Programming: Fundamental I/O Considerations – Programmed I/O – Interrupt I/O – Block Transfers and DMA.

UNIT - III

System Bus Structure: Basic 8086/8088 Configurations: Minimum Mode – Maximum Mode, System Bus Timing, Interrupt Priority Management: Interrupt System Based on a Single 8259A.

I/O Interfaces: Serial Communication Interfaces: Asynchronous Communication – Synchronous Communication – Physical Communication Standards – 8251A Programmable Communication Interface, Parallel Communication: 8255A Programmable Peripheral Interface - A/D and D/A Example, Programmable Timers and Event Counters: Intel's 8254 Programmable Interval Timer – Interval Timer Application to A/D, DMA Controllers.

UNIT - IV

Advanced Microprocessors: The 80386 : Introduction – Operating Modes – Processor Model – Programming Model, The 80486 : Introduction – Processor Model – Programming Model, The Pentium : Introduction – Processor Model – Programming Model – The Pentium Evolves – The Pentium MMX, The P6 Processors : Introduction – Overview – Processor Model – New Architectural Features.

Prescribed Books :

1. Yu-Cheng Liu, Glenn A Gibson, "Microcomputer Systems: The 8086/8088 Family", Second Edition, Pearson Education (2008)

Chapters : 1.1, 1.3 – 1.5, 2.1 - 2.3, 3.1 – 3.10, 4.1 – 4.5, 6.1 – 6.4, 8.1 – 8.2, 8.3.1, 9.1.1, 9.1.2, 9.1.4, 9.2, 9.3, 9.5

2. John Uffenbeck, "The 80x86 Family Design, Programming and Interfacing", Third Edition, Pearson Education (2006) **Chapters:** 3.3, 3.5 – 3.7

Reference Book:

1. Douglas V Hall, "Microprocessors and Interfacing", Second Edition, TMH
2. N.Mathivanan, "Microprocessors, PC Hardware and Interfacing", PHI (2007).
3. Kenneth J. Ayala, " The 8086 Microprocessor : Programming & Interfacing The PC", Cengage Learning (2008)
4. Barry B. Brey, "The Intel Microprocessors", Seventh Edition, PHI

MCA 505.3 : Web Engineering

Unit-I

Web-Based Systems: The Web, Web Applications

Web Engineering: What is Web Engineering, The Components of Web Engineering, Web Engineering Best Practices

A Web Engineering Process: Defining the Framework, Incremental Process Flow, Generic Actions and Tasks for the WebE Framework

Communication: The Communication Activity, Formulation Elicitation, Identifying WebApp Increments, Negotiation

Unit-II

Planning : Understanding Scope, Refining Framework Activities, Building a WebE Team, Managing Risk, Developing a Schedule, Managing Quality, Managing Change, Tracking the Project, Outsourcing WebE Work.

Analysis Modeling for WebApps: Understanding Analysis in the Context of WebE, Analysis Modeling for WebApps, Understanding the Users, The Content Model, The Interaction Model, The Functional Model, The Configuration Model, Relationship-Navigation Analysis.

WebApp Design : Design for WebApps, Design Goals, Design and WebApp Quality, The Design Process, Initial Design of the Conceptual Architecture, Initial Design of the Technical Architecture

Unit-III

Interaction Design : Interface Design Principles and Guidelines, Interface Design Workflow, Interface Design Preliminaries, Interface Design Steps, Aesthetic Design, Usability, Design Issues.

Information Design : Information Architecture, Organizing Content, Structuring the information Space, Blueprints : Adding Detail to a structure, Accessing Information, Wireframe Models, Navigation Design : Creating the Detailed structure, Summarizing the Design Process.

Functional Design : WebApp Functionality, The Nature of WebApp Functionality, Functional Design in the Design Process, Functional Architecture, Detailed Functional Design

Unit-IV

Construction and Deployment : Construction and Deployment within the WebE Process, Construction, Construction Principles and Concepts, Deployment, Construction and the Use of Components, Component-Level Design Guidelines, Component Design Steps

Technologies and Tools : General Issues, Implementation Tools and Technologies, Development Tools and Technologies

Testing WebApps : Testing Concepts, The Testing Process-An Overview, Content Testing, User Interface Testing, Usability Testing, Compatibility Testing, Component-Level Testing, Navigation Testing, Configuration Testing, Security and Performance Testing

Prescribed Book:

Roger S Pressman, David Lowe, "Web Engineering A Practitioner's Approach", TMH (2008)

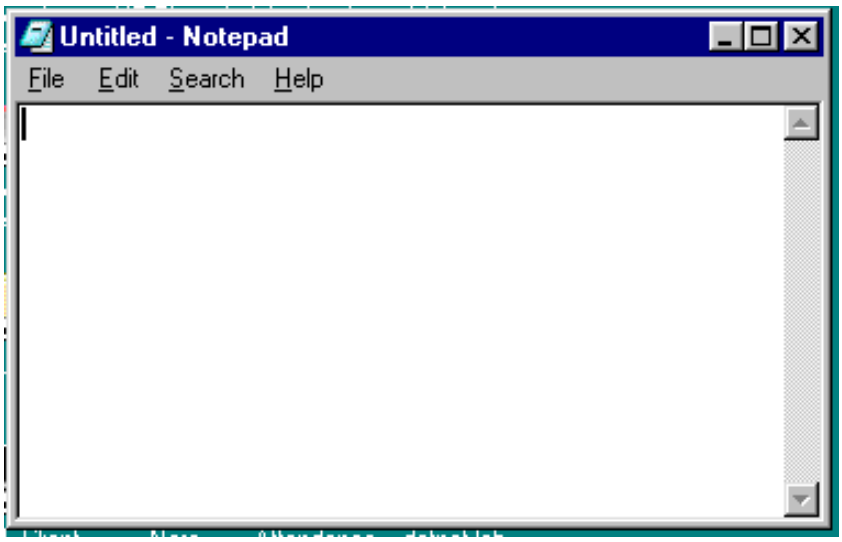
Chapters: 1 to 5, 7 to 12, 14, 15.

MCA 506 : . Net Programming Lab

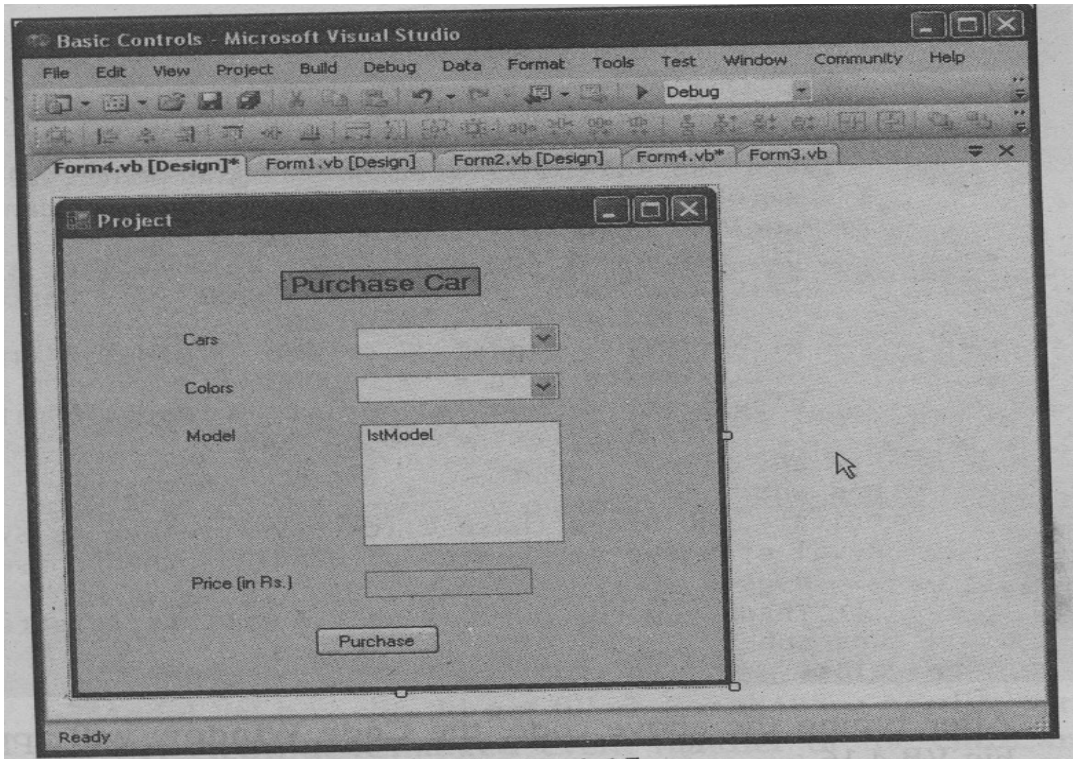
Lab Cycle

VB .NET:

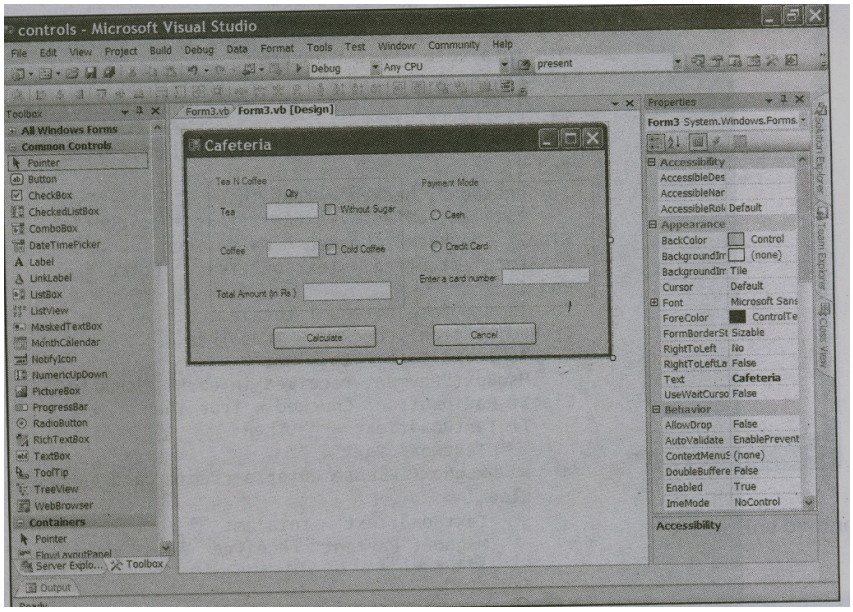
1) Develop an application which is similar to "Notepad" using menus.



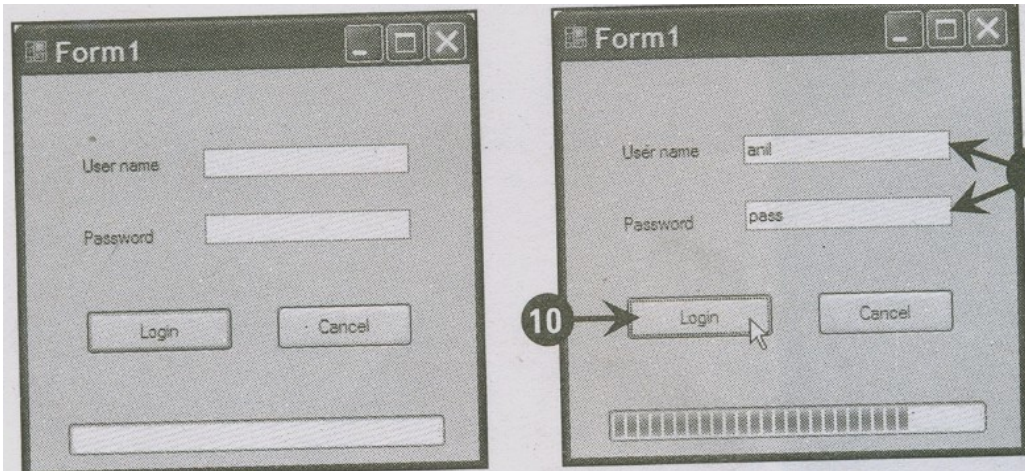
2) (a) Develop an application for facilitating purchasing order which will look like as shown below :



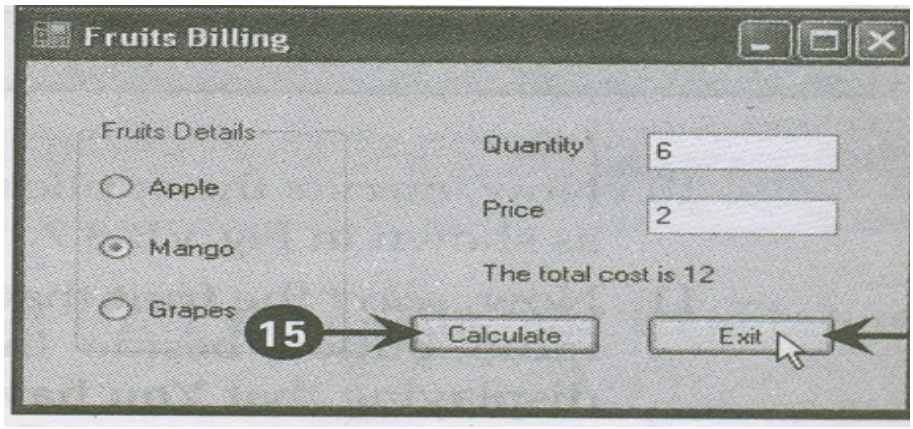
b) Develop an application for billing system in coffee shops which will look like as shown below :



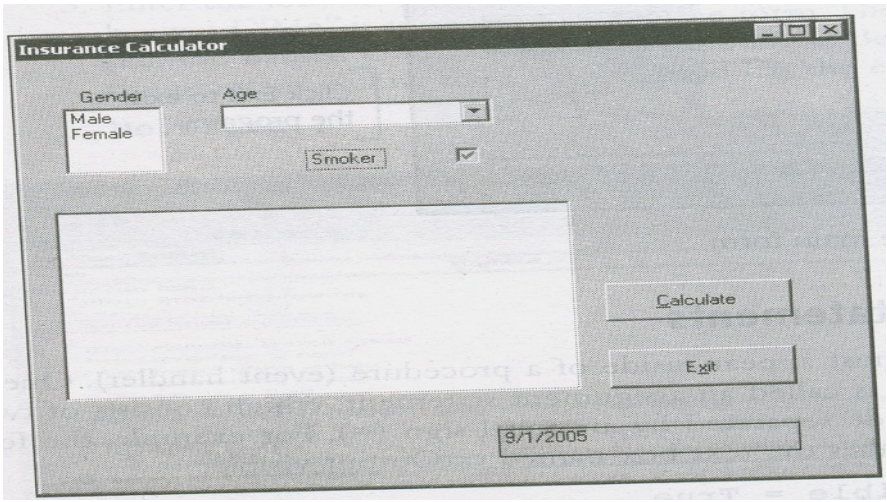
3 a) Develop an application which is similar to login form including the progress bar controls.



b) Develop an application for fruits billing system which will look like as shown below :



4.Develop an application which is helpful for calculating the insurance.



5 a) Develop an application using font dialog control

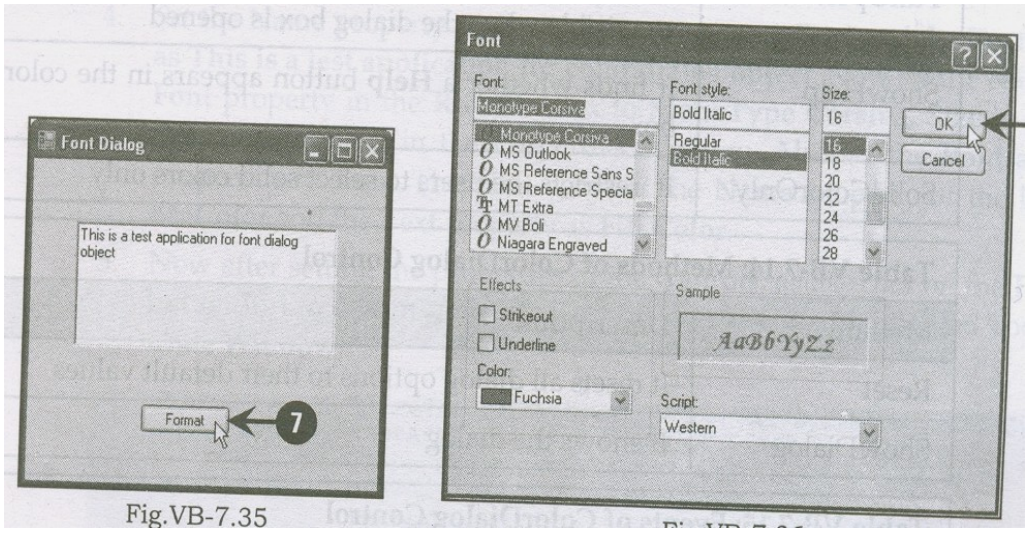


Fig.VB-7.35

b) Develop an application using color dialog control

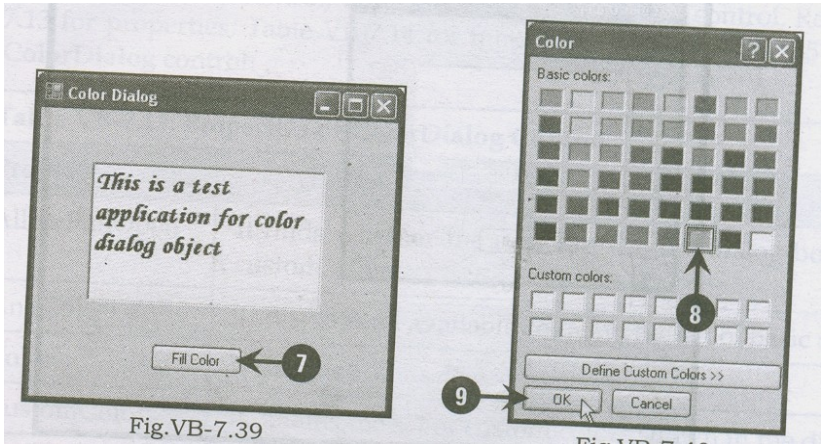


Fig.VB-7.39

6 Develop an application to display the file selected by the user in a web browser control.

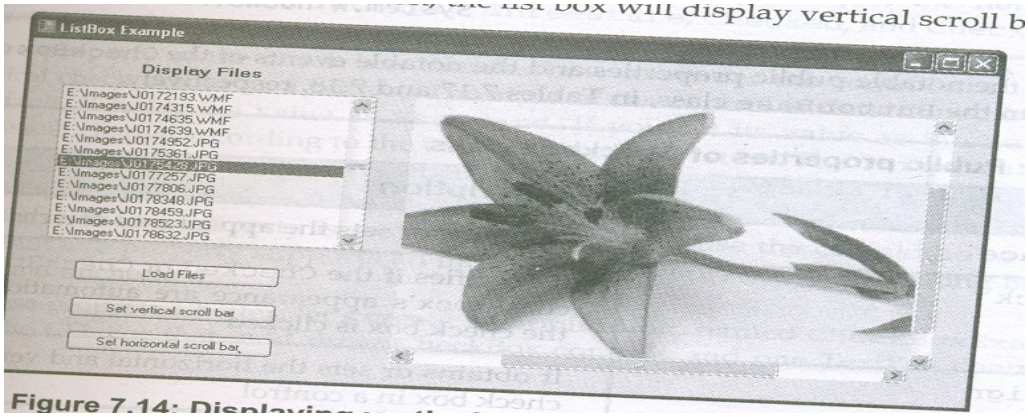
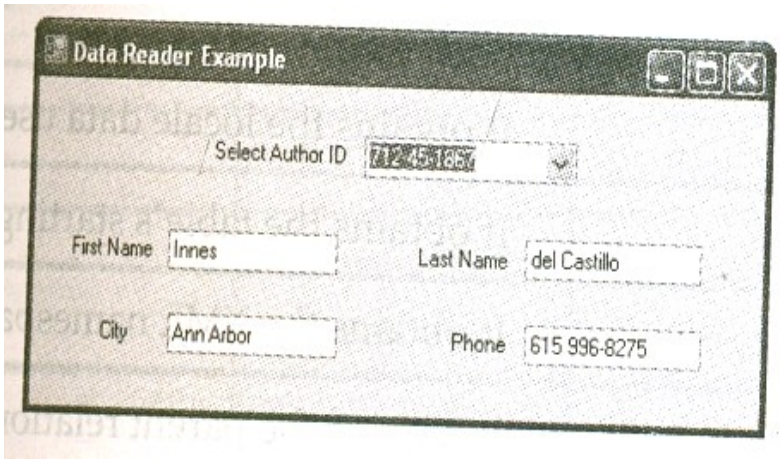


Figure 7.14: Displaying

7 Develop an application using the data reader to read from a database.



ASP.NET:

8 Design an application for dynamically populating a checkbox list.

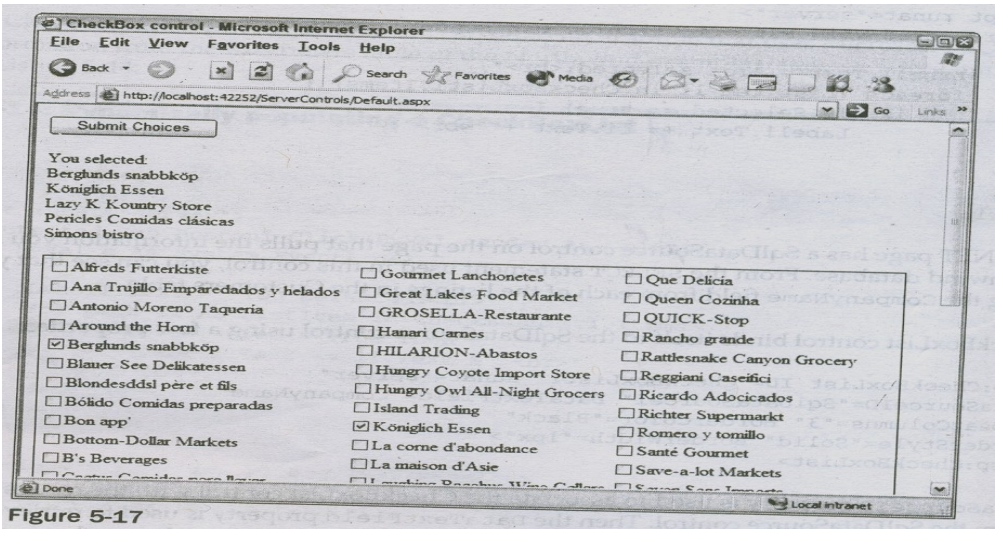


Figure 5-17

9 Develop an application for selecting a single day in the calendar control.

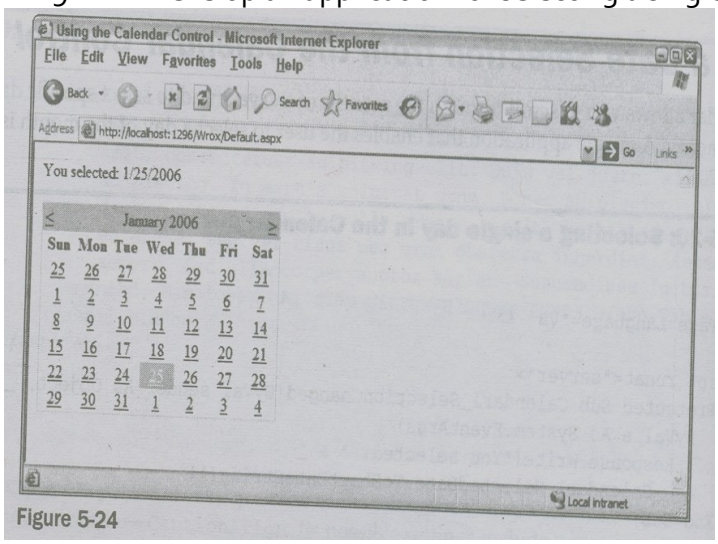
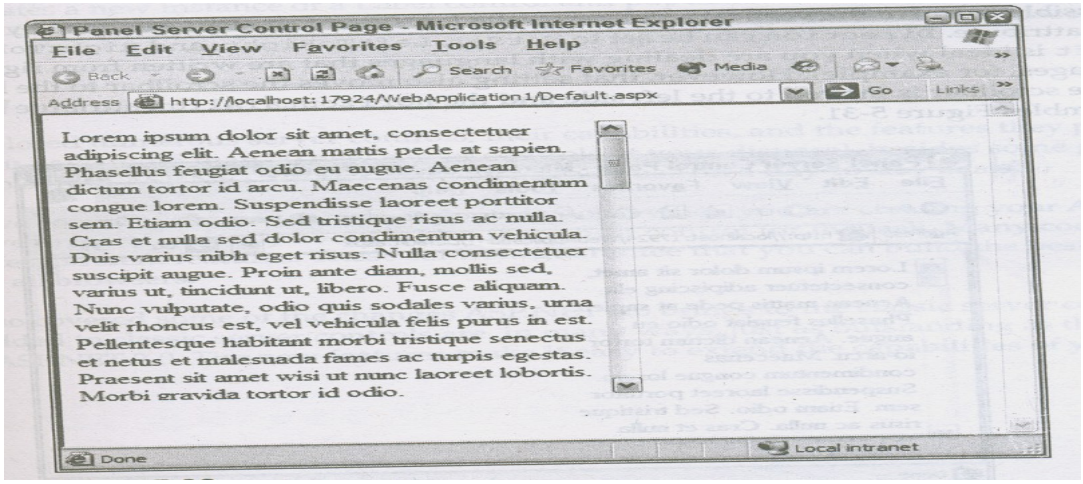


Figure 5-24

10. Design an application by using the new scroll bar feature with the panel server control.



11. Design an application with simple bulleted list control.

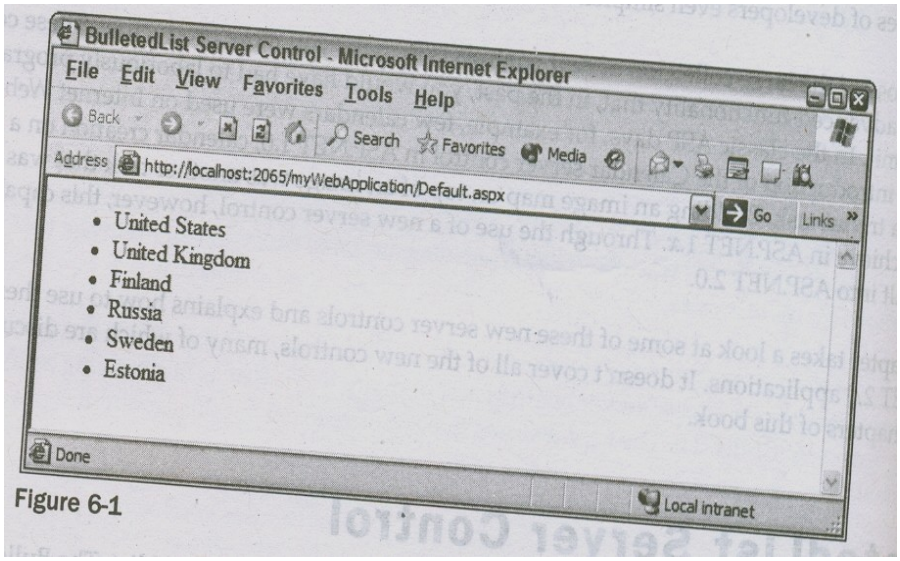
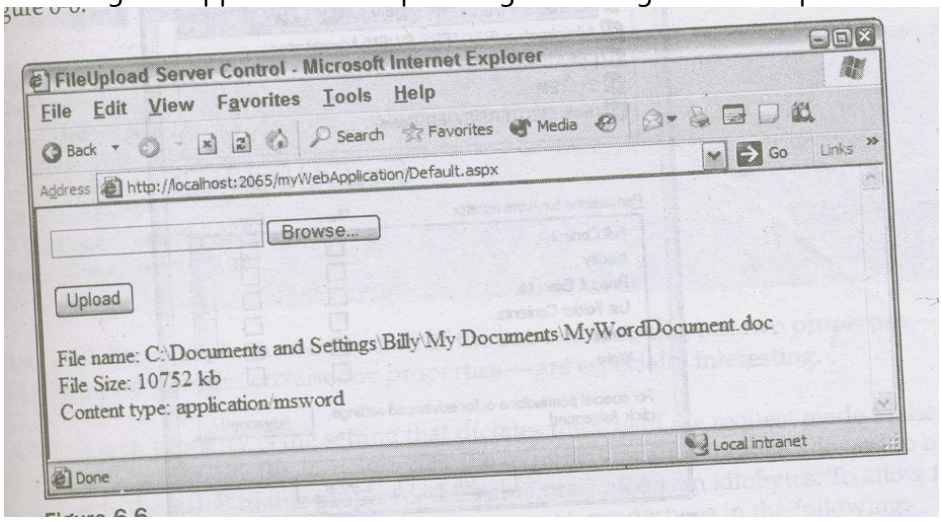
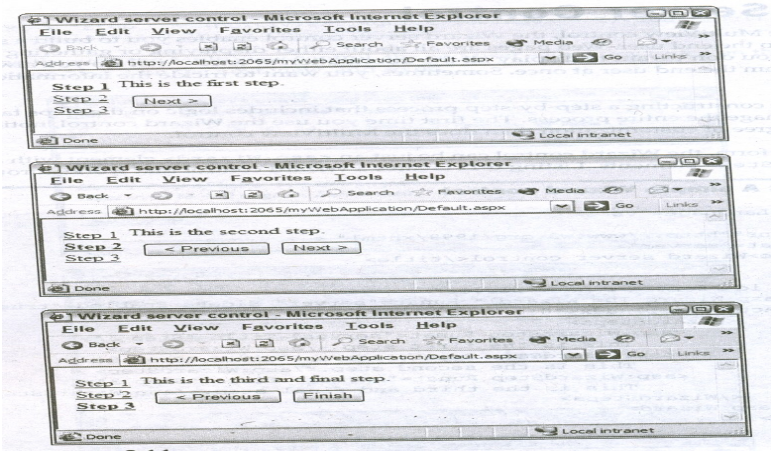


Figure 6-1

12. Design an application for uploading files using new file upload control.



13. Design an application for building a form in the wizard control.



14. Design an application by using the compare validator to test values against control values.

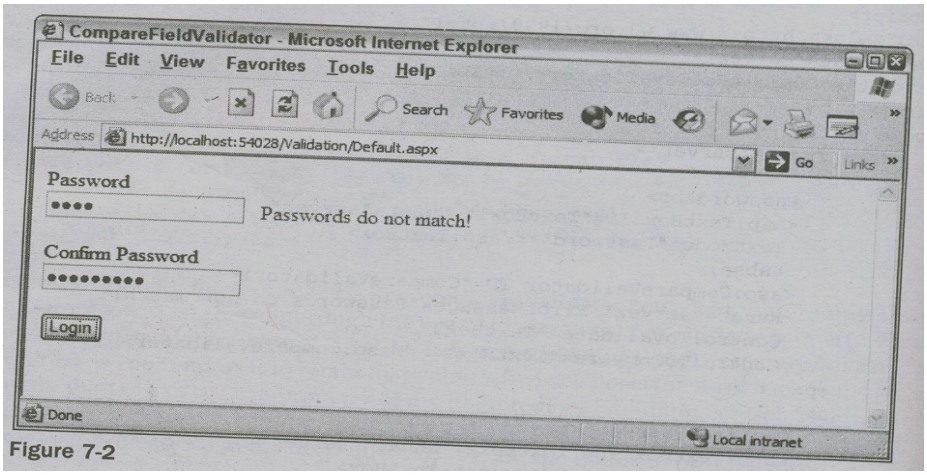
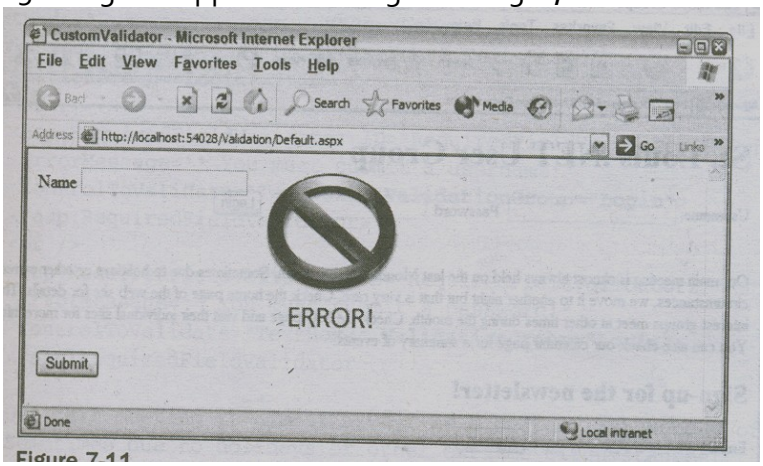


Figure 7-2

15.Design an application using the images, sounds for error notifications.



16.Design an application using the grid view control in an ASP.Net web page.

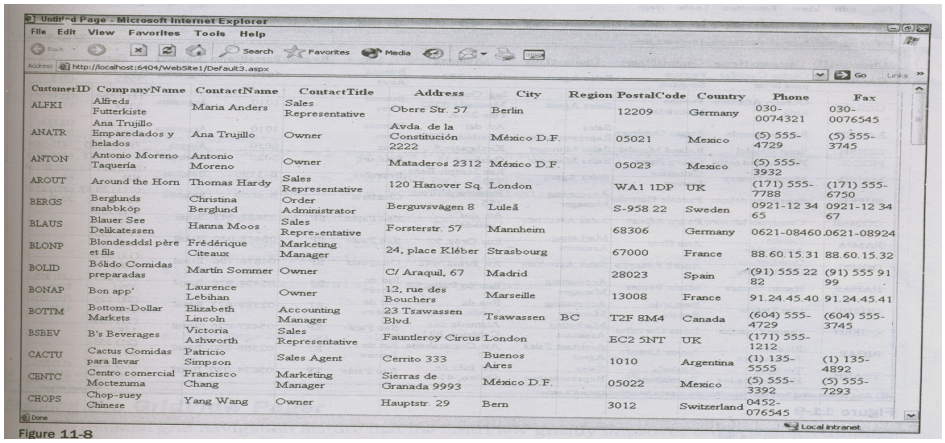


Figure 11-8

17.Design an application for adding an insert command to the sql data source control.

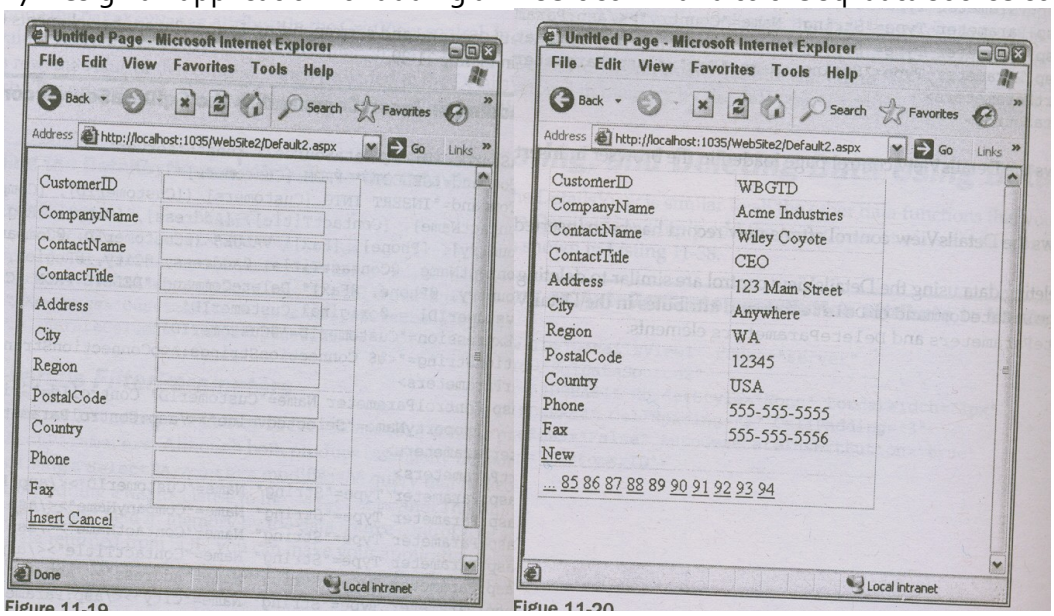
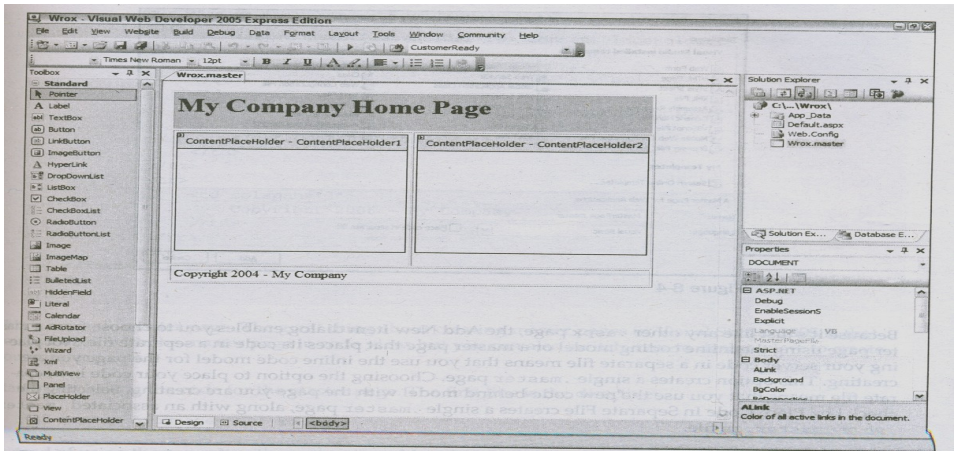


Figure 11-19 Figure 11-20

18. Design a web site using the concept of master pages.



C#.NET:

15. Develop a project for performing arithmetic, relational, logical operations.
16. Develop a project for demonstrating polymorphism, abstraction.
17. Develop a project for demonstrating switch statements.
18. Develop a project for implementing inheritance using abstract classes.
19. Develop a project for implementing interfaces using multiple inheritance.
20. Create a form that is the main window of a program using window class.
21. Create a form that is the main window with button program.
22. Create a form that is the main window of a program using the standard controls.
23. Create a form which displays the given inputs in the form of a tree view structure.
24. Develop a project for implementing exception handling in C#.
25. Develop a project which displays the student information in the relevant fields from the database which already exists.

MCA 507 : Advanced Java Lab

Lab Cycle

1 a) Write a program to download a web page.
   b) Write a program to download a web page using a URL Connection.
2 a) Write a program to print the socket information.
   b) Write a program to print the information in the Datagram
3. Develop a Client, Server Application to satisfy the requests from multiple clients.
4. Write a program to implement a server that will simply echo back whatever is typed by the client a)TCP b) UDP
5. Write a program to have chat application a) TCP b)UDP
6. Write a program to add Cookie and get Cookie.
7. Write a program to print the Fibonacci numbers using **RM**I.
8. Develop Multithreaded Message Application Using **Java Sockets**
9. Develop Multicast Communication using **Java Multicast class**
10. Develop Distributed Programming using **Java RMI**
11. Develop Database Programming using **JDBC** and **Java swings**
12. Develop Web Programming using **JSP** and **EJB**.
13. Create a JavaBean class called **Prompter** that displays a prompting message and provides an entry field where users can enter their response to the prompt. This bean should also include an OK button so users can indicate that they are finished entering their response.
14. Write a program to retrieve values from database and print them in a text file.
15. Write a program to create a frame with a label, text field and a submit button. The Text field should not an empty value.
16. Write a program to create a frame with menu bar. The menu bar contains two menus. The first menu contains menu items like square, cube, square root and absolute value. The second menu contains two menu items namely clear and exit.
17. Write a simple program to get the result of stored procedure in the servlet by JDBC through the Oracle Database.
18. Write a program using RMI to access the database using the primary key value and return the data to the client.

MCA 508 : Seminar

MCA 601 : Project Work