MCS 101 - DATA STRUCTURES IN C

UNIT-I

Arrays and Structures

Arrays, Dynamically allocated arrays, Structures and Unions, polynomials.

Stacks and Queues

Stacks, Stacks using Dynamic Arrays, Queues, Circular queues using dynamic arrays, Evaluation of expressions, multiple stacks and queues.

Linked List

Single Linked List and chains, Representing chains in C, Linked stacks and queues, polynomials, Polynomial representation, Adding polynomials, Additional list operations, Operations on chains, Operations for Circularly linked lists, Sparse Matrices , Sparse Matrix representation, Doubly Linked lists.

UNIT – II

Introduction

Terminology, Representation of trees

Binary Trees

The abstract data type, Properties of binary trees, Binary tree representations.

Binary tree traversals

Inorder traversal, Preorder traversal, Postorder traversal

Threaded Binary trees

Threads Inorder traversal of a threaded binary tree

Binary Search Trees

Definition, Searching a BST,Insertion into a BST, Deletion from a BST.

UNIT-III

Sorting

Motivation, Insertion sort, Quick sort, Merge sort, Heap sort, External sorting.

Hashing

Introduction

Static hashing

Hash tables, hash functions, Overflow handling

UNIT- IV

Graphs

The graph abstract data type

Introduction, definitions, graph representations

Elementary graph operations

Depth First Search, Breadth First Search, Connected Components, Spanning trees, Biconnected Components.

Minimum cost Spanning trees

Kruskals Algorithm, Prims algorithm.

Shortest paths

Single source problem, All pairs Shortest path.

Prescribed Book:

Horowitz, Sahani, Anderson - Freed,"Fundamentals of Data Structures in C",

Chapters 2-8

Reference Book:

1. D SAMANTA, "Classic Data Structures", –PHI
2. Balagurusamy, "C Programming and Data Structures", Third Edition, TMH (2008)

Model Question Paper

M.Sc.(Computer Science)
I SEMESTER
MCS-101: DATA STRUCTURES IN C

Time:3Hrs **Max. Marks:80**

ANSWER ALL THE QUESTIONS, All questions carry equal marks

I)Answer the following Questions 8x2=16M

a) Abstact data type
b) What is BFS?
c) Hash function
d) What are threaded binary trees
e) Sparse matrix
f) Circular Linked list
g) Convert the following infix expressions to post-fix form.
A+B*C-D/E+F*G*H
h) Depth first search

Unit -I

a) Write short notes on structures and Unions. (8M)
b) Write a program to insert and delete nodes form single linked list (8M)

(OR)

c) Explain stacks with deletion and insertions algorithms (10M)
d) Develop an algorithm to delete an element from a Queue. (6M)

Unit-II

a) Explain the various representations of trees. (8M)
b) Explain binary search trees (8M)

(OR)

c) Explain Threaded binary trees. (8M)
d) Explain the tree traversals. (8M)

Unit-III

a) Illustrate Heap sort through an example. (8M)
b) write short notes on Insertion sort. (8M)

(OR)

c) What is Merge sort ? (8M)
d) Explain static hashing. (8M)

Unit-IV

a) Write short notes on Representation of Graphs. (8M)
b) Explain Kruskals Algorithm. (8M)

(OR)

c) Explain Breadth first search and Depth first search. (8M)
d) Explain all pairs shortest path. (8M)

MCS 102 : JAVA PROGRAMMING

UNIT – I

An Introduction to Java: Java as a Programming Platform – Features of Java.
Fundamental Programming Structures in Java : A simple java program – Data Types – Variables – Operators – Input and Output – Flow Control – Command Line Arguments – Arrays – Strings.

UNIT – II

Introduction to Object Oriented Programming : Classes – Objects – Object and Object Variables – Method Overloading – Constructors – Constructor Overloading – Implicit and Explicit Parameters – Private Methods – Static Fields – Static Methods – Object Destruction and Finalize Method – Vectors – Wrapper Classes.
Packages: Package scope – class Importation – Addition of Classes into a Package.

UNIT - III:

Inheritance: Classes , Superclasses and subclasses – Inheritance Hierarchies – Polymorphism – Dynamic Binding – Final Classes and Final Methods – Abstract Classes – Protected Access.
Interfaces and Inner Classes : Interfaces – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interfaces – Inner Classes – Local Inner Classes – Accessing Final Variables from outer methods – Static Inner Classes.
Exception: Classification of Exception – Catching Exception – Throw and Throws clause – Finally.

UNIT – 4:

Applets : Simple Applet – Applet Life Cycle – Preparing to Applets – Creating and Executable Applet – Applet Tag – Adding Applet to HTML file – Passing parameters to Applets – Accessing Images and Audio Files.
Multithreading: Creation of Thread – Life Cycle of Thread – Thread States – Thread Properties – Synchronization.
Managing Input/Output Files in Java: Introduction – Stream Classes – Character Stream Classes – Input/Output Exceptions – Creation of Files – Random Access Files.

Prescribed Book:
Cay S. Horstmann Gray Cornell, "Core Java – Volume 1 Fundamentals", Eighth Edition, Pearson Education.

Chapters: 1, 3, 4, 5, 6, 10, 11, 14

Reference Book:

1. E.Balagurusamy, "Programming with Java", 3e, TMH (2007)
2. H.M.Deitel, P.J.Deitel, "Java How to Program", Sixth Edition, Pearson Education

MODEL PAPER

MCS 102 : JAVA PROGRAMMING

Time : 3 hrs **Max Marks : 80**

Answer ALL the following Questions. Each Question carries Equal marks.

1. a) What is the use of 'new' operator ?
b) How can you simulate the functionality of goto in Java.
c) Why Java doesn't support Pointers.
d) What is the difference between String Class and StringBuffer Class.
e) What is the use of Final Fields ?
f) What is the Difference between class variables and instance variables ?
g) What is meant by Thread ?
h) What is the use of Wrapper Class ?

UNIT – I

2. a) What are the Features of Java Programming Language? (8M)
b) Explain different data types available in Java. (8M)
(or)
c) Write a program for the following series. (8M)

$$1+\frac{2}{2!}+\frac{3}{3!}+.....+\frac{n}{n!}$$

d) How can you define arrays in Java. Write a Java Program for Binary Search. (8M)

UNIT – II

3. a) What is meant by Class? How can you define classes in Java (8M)
b) Explain method overloading with example (8M)
(or)
c) Explain Static Methods with example. (8M)
d) Discuss about Package Creation in Java. (8M)

UNIT – III

4. a) Explain Interfaces with example. (16M)
(or)
c) Explain about multiple catching mechanism in Java (8M)
d) Explain about throw and throws clauses. (8M)

UNIT – IV

5. a) Explain about life cycle of Thread (8M)
b) How can you create Applet in Java (8M)
(or)
c) Explain about RandomAccessFile with example (16M)

MCS-103 COMPUTER ORGANIZATION

UNIT I

Digital logic circuits
Logic gates, Boolean algebra, Map simplification, Combinational logic circuits, Flip flops, Sequential logic circuits.

Digital Components
Integrated circuits,Decoders, Multiplexers, Registers, Shift registers, Binary Counters, Memory unit

Data Representation:
Data types, Complements, Fixed & Floating point representation, Other binary codes, Error Detection codes

UNIT II

Register Transfer and micro operations
Register transfer language, Register transfer, Bus and Memory transfers, Arithmetic micro operations, Logical micro operations, shift micro operations, Arithmetic Logic shift unit

Basic Computer Organization and Design
Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input-output and Interrupt

UNIT III

Microprogrammed Control
control Memory, Address Sequencing, Microprogram example, Design of control unit.
Central Processing Unit, General Register Organization, Stack Organization, Instruction format, Addressing modes, Data Transfer and Manipulation, Program Control

UNIT IV

Computer Arithmetic
Introduction, Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating-Point Arithmetic Operations, Decimal Arithmetic Unit, Decimal Arithmetic Operations.

Input-Output Organization :
Peripheral Devices, Input Output Interface, asynchronous Data Transfer, Modes of Transfers, Priority Interrupt.
Memory Organization:
Memory Hierarchy, Main memory, Auxiliary Memory, Associative memory, Cache memory.

Prescribed Book:

Morris Mano, "Computer System Architecture", 3rd Edition, PHI.

Reference Books:

1. V. Rajaraman, T. Radha Krishnan, "Computer Organization and Architecture", PHI
2. Behrooz Parhami, "Computer Architecture", Oxford (2007)
3. ISRD group, "Computer Organization", ace series, TMH (2007)
4. William Stallings, "Computer Organization and Architecture – Designing for Performance", Pearson Education (2005)

Model Question Paper

M.Sc. (Computer Science)
I SEMESTER
MCS-103: COMPUTER ORGANISATION

Time:3Hrs **Max. Marks: 80**

ANSWER ALL THE QUESTIONS, All questions carry equal marks

I) Answer the following Questions 8x2=16M

(i) Give the truth table of a full subtractor.
(ii) what is multiplexer?
(iii) Perform the arithmetic operation (+42) + (-13) in binary using signed 2's complement representation for negative numbers.
(iv) Name different types of shift microoperations.
(v) Give an example for three address instruction.what way it is different from zero address instruction?
(vi) Give the Memory Hierarchy?
(vii) Specify Hardware requirements for Division Algorithm.
(viii) what is Handshaking?

Unit-I

a) Simplify the following Boolean function in sum of products form by means of a four variable map. Draw the logic diagram with a)AND-OR gates b)NAND gates $F(A,B,C,D)=\sum(0,2,5,8,9,10,11,14,15)$ (8M)

b) i) Show the circuit of a 5 by 32 decoder constructed with four 3 by 8 decoders one 2x4 decoder. (4M)
ii) What are Error Detection Codes? (4M)

(OR)

c) Explain the Working of JK FlipFlop with necessary circuit diagram. (8M)

d) i) Write short notes on fixed point Integer representation. (4M)
ii) Draw the logic diagram of 4-bit synchorous binary counter. (4M)

Unit-II

a) Design a combination circuit for 4 bit Adder subtractor. (8M)
b) Give the block diagram of control unit of a basic computer.(8M)

(OR)

c) Explain the steps performed in the 1^{st} pass of a two pass Assembler. (8M)
d) i) write about subroutines. (4M)
ii) write Register Transfer Language program for following instructions of a Basic computer i)LDA ii)STA (4M)

Unit-III

a) Draw and Explain the block diagram of a typical Microprogram sequences for a control memory. (8M)

b) i) Explain any four Address modes. (4M)

ii) Give the difference between Hardwire control and microprgm control. (4M)

(OR)

c) Explain Booth Multiplication Algorithm. (8M)

d) i) Give the Block diagram of BCD Adder. (4M)

ii) write about different types of Interrupts. (4M)

Unit-IV

a) Explain DMA Data transfer. (8M)

b) write about Virtual Memory. (8M)

(OR)

c) Discuss about various types of cache memory mapping procedures. (8M)

d) Explain Daisy chain priority Interrupt. (8M)

MCS104:DISCRETE MATHEMATICAL STRUCTURES

UNIT - I

Mathematical Logic:Connectives, Well formed Formulas, Truth Tables, tautology, Equivalence, Implication, Normal forms, Predicates, Free & bound variables, Rules of inference, consistency, Proof by contradiction, Automatic theorem Proving.

UNIT - II

Set Theory:Properties of binary Relations, Equivalence, Compatibility & Partial ordering relations, Hasse Diagram, functions, Inverse function, composition of functions, Recursive functions

UNIT - III

Algebraic Structures

Semi groups and Monoids, Groups, Homomorphism, group codes.

Lattices and Boolean Algebra introduction - lattices as partially ordered set, Boolean Algebra and Boolean functions

UNIT - IV

Graph Theory

Introduction - Basic concepts of graph theory, Isomorphism's and subgraphs, connected components, cyclic graph, Bipartite graph, planar graphs, eulers formula, euler's circuits, de bruijin sequence, hamiltonian graphs, chromatic numbers, cut set, tie set, the four-color problem

Prescribed Books :

1. J.P.Tremblay & R.Manohar, "Discrete Mathematical Structures with Applications to computer science", - TMH

2. Joe L.Mott, Abraham Kande, Theodore P. Baker," Discrete Mathematics for computer scientists and Mathematicians – PHI

Reference Books:

1. Ralph P. Grimaldi, B.V. Ramana, "Discrete and Combinational Mathematics", 5th Edition, Pearson Education (2008).

2. Swapan Kumar Sarkar, "A Text Book of Discrete Mathematics", S.Chand (2008).

3. D.S.Malik and M.K.Sen, "Discrete Mathematical Structures", Thomson (2006).

Model Question Paper

M.Sc.(Computer Science)
I SEMESTER
MCS-104: DISCRETE MATHEMATICAL STRUCTURES

Time:3Hrs **Max. Marks:80**

ANSWER ALL THE QUESTIONS, All questions carry equal marks

(I).Answer all the following questions.

(a).Draw hash diagram of set below under the partial ordering "divides"{3,9,27,54} (2M)

(b).Define a wellformed formula? Give truth table for the folowing formula $p \leftrightarrow q$ (2M)

(c).Defien abelion group and homomarphism. (2M)

(d).Prove the fallowing boolean identity $a \oplus (a^{1} * b) = a \oplus b$ (2M)

(e).State four colour problem. (2M)

(f).Prove that any edge of a connected simple graph a is an edge of some shanning treeof G(2M)

(g).Give an example of a finate semigroup that does not have identity element and has cardinality greater than 2. (2M)

(h).What is a choromatic number (1M)

Unit - I

(a).Obtain the principle disjunctive normal form of $P \rightarrow ((P \rightarrow Q) \wedge 7(7Q \vee 7P)$ (8M)

(b).Show that RVS fallows logically from the premises.
CVP, $(CVP) \rightarrow 7H, 7H \rightarrow (A \wedge 7B)$ and $(A \wedge 7B) \rightarrow (RVS)$ (8M)

(0R)

(C).Show that $7(P \wedge Q)$ fallows from $7P \wedge 7Q$. (8M)

(d).Prove that $(A \wedge B) \times (C \wedge D) = (A \times C) \wedge (B \times D)$. (8M)

Unit-II

(a).Determine whether the following is a tautology inconsistancy or neither of two. $(P \rightarrow Q) \vee (P \rightarrow Q)$ [Where V stands for OR] (7M)

(b).State and prove Legranges theorem. (9M)

(OR)

(c).for any connected planar graph.
Prove that : v-e+r=2. Where v-no of vertices e-no of edges r-no of regions of the graph respectively. (8M)

(d).Define adjacency matrix and path matrix of a graph G . (8M)
whose adjacency matrix is given by

$$\begin{matrix} 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & 1` \\ 0 & 1 & 1 & 0 \end{matrix}$$

Unit -II

(a).How many 6 digit number without repitation of digit are there. Such that the digits are all non-zero and '1' and '2' do not appear consecutively in either order (8M)

(b).How many ways are there to roll two distinguishable dice to yield a sum that is divisible by 3 ? (8M)

(OR)

(c).Show that in a group <G, *>, if for any a,b,∈ G, $(a * b)^2 = a^2 * b^2$ then <G,* > must be abelian (8M)

(d).show that the set of all the invertible elements of a monoid from a group under the same operation as that of the monoid. (8M)

Unit-III

(a).Show that the following equivalance :

$(P \rightarrow Q) \wedge (R \rightarrow Q) \Leftrightarrow (PVR) \rightarrow Q$ (8M)

(b).consider the statements.

S1 :All cats are animals.

S2 :Some cats are black.

S3.Some animals are black.

Show S3 follows from S1 and S2. (8M)

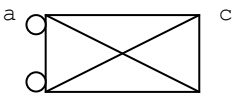
(OR)

(c). In any boolean algebra prove that : $(a+b)(a^1+c) = ac+a^1 b+bc$. (6M)

(d).Write down the adjacency matrix of the following graph.

Also find (I) .the indegree & outdegree of each node.

(ii).Transitive closure. (10M)



MCS105 - SOFTWARE ENGINEERING

Unit - I

Introduction to software engineering (chapter 1)
The Process (chapters 2, 3)
Metrics for Process and Project (chapter 22)
Project management (chapter 21)

Unit - II

Requirement engineering (chapter 7)
Building the Analysis Modeling (chapter 8)
Design engineering (chapter 9)

Unit - III

Creating an Architectural Design (chapter 10)
Performing User Interface Design (chapter 12)

Unit - IV

Testing Strategies (chapter 13)
Testing Tactics (chapter 14)

Prescribed Book:

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

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).

M.Sc. Degree Examination
Second Semester
Computer Science
MCS105 - SOFTWARE ENGINEERING

Time: 3 Hours Max. Marks: 80

Answer all questions

1. Write Short note on (2*8=16M)
   a. Process
   b. waterfall model
   c. use case
   d. specification review
   e. modality
   f. testability
   g. stakeholders
   h. metrics

UNIT-I

2(a) What are software measurements explain them in detail (8)

(b) What are software myths explain (8)

(Or)

2(c)What is an RAD model explain (8)

2(d) What is the role of the project and process in management spectrum. (8)

UNIT-II

3(a) Explain the elicitation requirement (8)

3(b) Explain the flow oriented modeling (8)

(Or)

3(c) Explain the creation of behavioral modeling (6)

3(d) Explain the design concepts (10)

UNIT-III

4(a) Explain the architectural styles. (8)

4(b) Discuss the golden rules of interface design. (8)

(OR)

4(c) Explain the transform, transaction mappings (8)

4(d) What are the design steps involved in user interface. (8)

UNIT-IV

5(a) Discuss the following (16)

(i)White box testing.

(ii) Black box testing.

(OR)

5(b)Write a short notes on Test strategies for conventional software. (16)

MCS106: Data Structures Lab Using C

Lab cycle

1. **Program for Sorting 'n' elements Using bubble sort technique.**
2. **Sort given elements using Selection Sort.**
3. **Sort given elements using Insertion Sort.**
4. **Sort given elements using Merge Sort.**
5. **Sort given elements using Quick Sort.**
6. **Implement the following operations on single linked list.**
   (i) Creation (ii) Insertion (iii) Deletion (iv) Display
7. **Implement the following operations on double linked list.**
   (i) Creation (ii) Insertion (iii) Deletion (iv) Display
8. **Implement the following operations on circular linked list.**
   (i) Creation (ii) Insertion (iii) Deletion (iv) Display
9. **Program for splitting given linked list.**
10. **Program for traversing the given linked list in reverse order.**
11. **Merge two given linked lists.**
12. **Create a linked list to store the names of colors.**
13. **Implement Stack Operations Using Arrays.**
14. **Implement Stack Operations Using Linked List.**
15. **Implement Queue Operations Using Arrays.**
16. **Implement Queue Operations Using Linked List.**
17. **Implement Operations on Circular Queue.**
18. **Construct and implement operations on Priority Queue.**
19. **Implement Operations on double ended Queue.**
20. **Converting infix expression to postfix expression by using stack.**
21. **Write program to evaluate post fix expression.**
22. **Implement Operations on two way stack.**
23. **Add two polynomials using Linked List.**
24. **Multiply Two polynomials using Linked List.**

25. **Construct BST and implement traversing techniques recursively.**
26. **Implement preorder traversal on BST non recursively.**
27. **Implement inorder traversal on BST non recursively.**
28. **Implement postorder traversal on BST non recursively.**
29. **To Convert matrix into sparse matrix.**
30. **Implement binary search techniques recursively.**
31. **Program to implement graph traversing techniques DFS AND DFS.**
32. **Program to estimate shortest path for a graph.**

MCS 107: 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.

MCS 108 : Seminar

MCS 201 : 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).

1. Anders Moller and Michael schwartzbach, "An Introduction to XML and Web Technologies", Addison Wesley (2006)

2. Chris Bates, "Web Programming–Building Internet Applications", Second Edition, Wiley (2007).

3. Jeffrey C. Jackson, "Web Technologies – A Computer Science Perspective", Pearson Education (2008).

Model Paper

MCS 201 : Web technologies

Time: 3 Hrs **Max. Marks: 80**

Answer ALL the following Questions. Each question carries Equal Marks.

Section – A

(2*8=16M)

1) a) What are Meta search engines?
   b) In which situation, IMAP best suits?
   c) How can we specify colors for visited and active hyperlinks?
   d) Define DOM.
   e) What is the purpose of cookies?
   f) Write about X-ray filter?
   g) How can we validate the data stored in checkboxes?
   h) What is a resolver?

Section - B

Answer ONE Question from each unit. Each question carries sixteen marks.

Unit-I

2) a) What are the different ways to access E-mails stored in the recipient's mail server? **(8M)**
   b) Write the series of steps that takes place when a client wants to access a webpage? **(8M)**

(OR)

   c) Discuss about the internet applications: telnet, FTP and remote login? **(8M)**
   d) List out all the attributes in <head> tag with examples? **(8M)**

Unit-II

3)
   a) Define css, what are the different types of style sheets available? **(8M)**
   b) Write the available functions available in java script to work on strings? **(8M)**

(OR)

   c) Write the various types of filters available? Explain them with examples? **(8M)**
   d) Explain different control structures available in VB script? **(8M)**

Unit-III

4)

a) List out different DTD attributes and explain the process to declare them? **(8M)**

b) Write the procedure to define arrays in perl? **(8M)**

(OR)

c) Write the XML syntax and structure rules? **(8M)**

d) What are environment variables? List out different CGI environment variables. **(8M)**

Unit-V

5)

a) Compare CGI and servlets. **(8M)**

b) Briefly explain the components of JSP **(8M)**

(OR)

c) Write a servlet that calculates the factorial of a given no that has been submitted through a form. **(8M)**

d) Explain the concept of ADO. **(8M)**

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MCS-202 DATABASE MANAGEMENT SYSTEMS

UNIT -I

Introduction
Data Base system applications, Focus of data base systems, view of Data, Data base languages, relational data bases, Data base design, Data storage and query, Transaction management.

Data base design and Entity-Relationship model:
Overview of the design process, Entity-Relationship model, constraints, Entity- Relationship diagrams, Entity-Relationship design issues, Weak Entity sets.

Relational Model:
Structure of relational databases, Fundamental Relational Algebra operations, Modification of the database, Extended Relational Algebra Operations, Null Values.

UNIT -II

SQL:
Background, Data definition, Basic structure of SQL queries, set operations, aggregate Functions, null values, Nested sub queries, views, complex queries, modification of the database, joined relations.

Advanced SQL:
SQL data types and schemas, Integrity constraints, Authorization,
Embedded SQL, Dynamic SQL

UNIT - III

Storage and File Structure:
Overview of physical storage media, Magnetic disks, RAID, Tertiary storage, storage access, file organization, Organization of records in files, data dictionary storage.

Indexing and Hashing:
Basic Concepts, ordered indices, B+ tree index files, B-tree index files, static hashing, dynamic hashing, compression of ordered indexing & hashing, index definition in SQL, Multiple key Access.

UNIT – IV
Relational database design:
Features of good relational design, Atomic domains and First Normal form, Decomposition using functional dependencies, functional dependency theory, Decomposition using functional dependencies, Decomposition using Multivalued dependencies, more normal forms, database design process, Modeling temporal data.

Concurrency Control:
Lock-based protocols, Timestamp-based protocols, validation based protocols, multiple granularity, Deadlock handling, Concurrency in Index Structure.

Prescribed Book:
Silberschatz, korth, sudarshan - Database system concepts - McGrawHill - 5th edition

Reference:
1.Fundamentals Of Database Systems – Elmasri & Navathe.
2.Database management systems - Raghu Rama Krishnan, McGraw-Hill
3.Database Management Systems – C.J.Date
4.Oracle DBA Certification Exam Guide – Jason S. Couceman Tata McGraw Hill Edition 99.

Model Question Paper

M.Sc. (Computer Science)
I SEMESTER
MCS-202 : DATABASE MANAGEMENT SYSTEMS

Time:3Hrs **Max. Marks: 80**
ANSWER ALL THE QUESTIONS, All questions carry equal marks

Time:3hrs Max.Marks:80M

1. Write Short notes on 2X8=16M
a) Constraint.
b) Superkey.
c) Complete outer join.
d) Rename operation.
e) Functional dependency
f) Normal forms
g) Magnetic disks
h) Ordered indices

UNIT - I

2(a) Explain the weak entity sets. (8)
2(b) Explain Generalization & Specialization. (8)
(OR)
2(c) Explain Fundamental operations with syntax & examples. (16)

UNIT - II

3(a) Explain the Basic structure of SQL queries. (16)
(OR)
3(b) What are Modifications to the database. (6)
3(c) Explain Views. (10)

UNIT - III

4(a) What is multiple key access (8)
4(b) Explain file organization (8)
(OR)
4(c)Explain Raid levels. (8)
4(d) What are B+ tree index files explain with an example for insertion. (8)

UNIT - IV

5(a) What is 4^{th} Normal form explain with an example. (8)
5(b) Explain multiple Granularity. (8)
(OR)
5(c) What is BCNF explain with an example. (8)
5(d) Explain what is a deadlock and how to handle them. (8)

MCS 203: Operating Systems

UNIT–I:

Introduction : What Operating Systems Do – Computer System Orgranization – Computer system Architecture – Operating System Structure – Operating System Operations – Process Management – Memory Management – Storage Management – Protection and Security – Distributed Systems – Special purpose Systems – Computing Environments.

System Structure: Operating System Services – User Operating System Interface – System Calls – Types of System Calls – System Programs – Operating System Design and Implementation – Operating System Structure – Virtual Machine – Operating System Generation – System Boot.

Process Concept : Overview – Process Scheduling – Operations on Processes – Interprocess Communication – Examples of IPC Systems – Communication in Client Server Systems.

UNIT–II:

Multithreaded Programming : Overview – Multithreading Models – Thread Libraries – Threading Issues – Operating System Examples.

Process Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Thread Scheduling.

Synchronization: Background – The Critical Section Problem – Peterson's solution – Synchronization Hardware – Semaphores – Classic Problem of Synchronization – Monitors – Synchronization Examples – Atomic Transaction.

UNIT–III:

Deadlocks : System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock.

Memory Management Strategies: Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation – Example: The Intel Pentium.

Virtual Memory Management: Background – Demand Paging – Copy on Write – Page Replacement – Allocation of Frames – Thrashing.

UNIT–IV:

File System : File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection.

Implementing File Systems : File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free Space Management – Efficiency and Performance – Recovery – Log structured File Systems.

Secondary Storage Structure : Overview of Mass – Storage Structure – Disk Structure – Disk Attachment – Disk Scheduling – Disk Management – Swap Space Management – RAID structure.

I/O Systems: Overview – I/O Hardware – Application I/O Interface – Kernal I/O Interface – Transforming I/O requests to Hardware Operations – Streams – Performance.

Prescribed Book:

Abraham Silberschatz, Peter Baer Galvin, Greg Gagne. "Operating System Principles", Seventh Edition, Wiley.

Chapters: 1.1 – 1.12, 2.1 – 2.10, 3.1 – 3.6, 4.1 – 4.5, 5.1 – 5.5, 6.1 – 6.9 , 7.1 – 7.7 , 8.1 – 8.7, 9.1 – 9.6, 10.1 – 10.6, 11.1 – 11.8, 12.1 – 12.7, 13.1 – 13.7

Reference Book:

1. William Stallings, "Operating Systems – Internals and Design Principles", Fifth Edition, Pearson Education (2007)

2. Achyut S Godbole, "Operating Systems", Second Edition, TMH (2007).

3. Flynn/McHoes, "Operating Systems", Cengage Learning (2008).

4. Deitel & Deitel, "Operating Systems",Third Edition, Pearson Education (2008).

Model Paper

MCS 203: Operating Systems

Time: 3 Hrs **Max. Marks: 80**

Answer all the following questions. Each question carries 16 marks.

1.a) Advantages of Multiprocessor Systems.
b) What is s System Call ?
c) Importance of PCB
d) Difference between Thread and Process.
e) Advantages of Segmentation.
f) Virtual Memory is Logical or Physical, Why ?
g) Why Operating System requires Second Storage Support for its Operation ?
h) What are file attributes ?

UNIT – I

2.a) Explain Traditional computing, Client-Server computing and peer- to-peer computing
b) Describe Storage device Hierarchy

(or)

c) Discuss different types of Operating System Structures
d) Explain Process Scheduling

UNIT – II

3.a) Discuss different threading issues.
b) Explain semaphores with suitable examples.

(or)

c) Compare different types of Process Scheduling Algorithms.

UNIT – III

4.a) Explain Deadlock avoidance mechanisms.
b) Describe swapping with diagram.

(or)

c) Explain segmentation.
d) Write about LRU page replacement and Optimal page replacement.

UNIT - IV

5.a) Explain different file access metods.
b) Described linked file allocation methods.

(or)

c) Explain different RAID levels.
d) Discuss about interrupt driven I/O cycle.

MCS 204: Computer Networks

UNIT – I

Introduction : Uses of Computer Networks: Business Application, Home Applications, Mobile Users – Social Issues. Network Hardware : Local Area Networks – Metropolitan Area Networks – Wide Area Networks – Wireless Networks – Home Networks – Internetworks. Network Software: Protocol Hierarchies – Design Issues for the Layers – Connection Oriented and Connectionless Services – Service Primitives – The relationship of Services to Protocols. Reference Models: The OSI Reference Model – The TCP/IP Reference Model – A Comparison of OSI and TCP/IP reference Model – A Critique of the OSI Model and Protocols – A Critique of the TCP/IP reference model. Example Networks: The Internet – Connection Oriented Networks:x.25, Frame Relay, and ATM – Ethernet – Wireless LANs Network Standardization: Who's who in the Telecommunication World – Who's who in the International Standards World – Who's who in the Internet Standards World.

Physical Layer: Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics

Data Link Layer: Data Link Layer Design Issues: Services Provided to the Network Layer – Framing – Error Control – Flow Control. Error Detection and Correction: Error correcting Codes – Error Detecting Codes. Elementary Data Link Protocols : An unrestricted Simplex Protocol – A simplex Stop- and – wait Protocol – A simplex Protocol for a Noisy channel. Sliding Window Protocols: A one-bit sliding Window Protocol – A Protocol using Go Back N – A Protocol using selective Repeat. Example Data Link Protocols: HDLC – The Data Link Layer in the Internet.

UNIT – II

The Medium Access Control Sublayer : Ethernet : Ethernet Cabling – Manchester Encoding – The Ethernet MAC sublayer Protocol – The Binary Exponential Backoff Algorithm – Ethernet Performance – Switched Ethernet – Fast Ethernet – Gigabit Ethernet – IEEE 802.2: Logical Link Control – Retrospective on Ethernet. Wireless Lans: The 802.11 Protocol Stack - The 802.11 Physical Layer - The 802.11 MAC sublayer Protocol - The 802.11 Frame Structure. Bluetooth: Bluetooth Architecture – Bluetooth Applications – The Bluetooth Protocol Stack – The Bluetooth Radio Layer – The Bluetooth Baseband Layer – The Bluetooth L2CAP layer – The Bluetooth Frame Structure. Data Link Layer Switching: Bridges from 802.x to 802.y – Local Internetworking – Spanning Tree Bridges – Remote Bridges – Repeaters, Hubs, Bridges, Switches, Routers and Gateways – Virtual LANs.

UNIT – III

The Network Layer: Network Layer Design Issues : Store – and Forward Packet Switching – Services Provided to the Transport Layer – Implementation of Connectionless Services – Implementation of Connection Oriented Services – Comparison Of Virtual Circuit and Datagram subnets. Routing Algorithms : The Optimality Principle – Shortest Path Routing – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcast Routing – Multicast Routing – Routing for Mobile Hosts. Internet Working : How Networks Differ – How Networks can be connected – Concatenated Virtual Circuits – Connectionless Internetworking – Tunneling – Internet work Routing – Fragmentation. The Network Layer in the Internet: The IP Protocol – IP address – Internet Control Protocols – OSPF – The Internet Gateway Routing Protocol – BGP – The Exterior Gateway Routing Protocol.

The Transport Layer: The Transport Service: Services provided to the Upper Layers – Transport Services Primitives – Berkeley Sockets. Elements of Transport Protocols : Addressing – Connection Establishment – Connection Release – Flow Control and Buffering – Multiplexing – Crash Recovery. The Internet Transport Protocols :UDP
Introduction to UDP – Remote Procedure Call – The Real Time Transport Protocol. The Internet Transport Protocols: TCP Introduction to TCP – The TCP Service Model – the TCP Protocol – The TCP segment header – TCP connection establishment – TCP connection release – Modeling TCP connection management- TCP Transmission Policy – TCP congestion Control – TCP Timer Management – Wireless TCP and UDP – Transactional TCP.

UNIT – IV:

The Application Layer: DNS : The Domain Name System : The DNS Name Space – Resource Records – Name Servers. Electronic Mail : Architecture and Services – The User Agent – Message Formats – Message Transfer – Final Delivery. The World Wide Web: Architecture Overview – Static Web Documents – Dynamic Web Documents – HTTP – The Hyper Text Transfer Protocol – Performance Enhancements – The Wireless Web. Multimedia: Introduction to Digital Audio – Audio Compression – Streaming Audio – Internet Radio – Voice Over IP – Introduction to Video – Video Compression – Video on Demand.

Prescribed Book:

Andrew S. Tanenbaum, "Computer Networks", Fourth Edition, PHI.

Chapters: 1.1 to 1.6, 2.2, 3.1 to 3.4, 3.6, 4.3, 4.4, 4.6, 4.7, 5.1, 5.2.1 to 5.2.9, 5.5, 5.6.1 to 5.6.5, 6.1.1 to 6.1.3, 6.2, 6.4, 6.5, 7.1 to 7.4

Reference Books:

1. James F.Kurose, Keith W.Ross, "Computer Networking", Third Edition, Pearson Education

2. Behrouz A Forouzan, "Data Communications and Networking", Fourth Edition, TMH (2007)

3. Michael A. Gallo, William M. Hancock, "Computer Communications and Networking Technologies", Cengage Learning (2008)

MODEL PAPER

MCS 204 : Computer Networks

Time : 3 hrs **Max Marks : 80**

Answer ALL the following Questions. Each Question carries Equal marks. (8 * 2 = 16)

1. a) Difference between Protocol and Service.
   b) Describe Ethernet.
   c) Why Repeaters are required.
   d) Give any two applications of Bluetooth.
   e) What are the problems with Flooding.
   f) Where UDP protocol is used.
   g) Define HTTP.
   h) Define User Agent.

UNIT – I

2. a) Compare OSI and TCP/IP reference models. (8M)
   b) Describe Go Back N protocol. (8M)

(or)

   c) Explain the architecture of the Internet (8M)
   d) Write about design issues of a Data Link layer. (8M)

UNIT – II

3. a) Explain Spanning tree Bridges. (8M)
   b) Give and explain 802.11 frame structure, services (8M)

(or)

   c) Describe architecture,applications, protocol stack of Bluetooth (10M)
   d) Explain Switched Ethernet (6 M)

UNIT – III

4. a) Explain IP Header Format and IP addresses (8M)
   b) Discuss about Tunneling and Fragmentation (8M)

(or)

   c) Explain Distance Vector Routing Algorithm (8M)
   d) write about TCP Congestion Control (8M)

UNIT – IV

5. a) Explain about DNS (8M)
   b) Write about URL's (8M)

(or)

   c) Explain Electronic Mail concept (8M)
   d) Discuss JPEG Compression mechanisam (8M)

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MCS 205 - DESIGN & ANALYSIS OF ALGORITHMS

Unit I

Introduction to Computer Algorithms- Algorithm Specification, Performance Analysis, Randomized algorithms

Elementary Data Structures- Stacks and Queues, Tree, Dictionaries, Priority Queues, Sets and Disjoint Set Union, graphs

Unit - II

Divide - And – Conquer - General Method, Binary Search, Maximum and Minimum, Merge Sort, Quick Sort, Selection, Strassen's Matrix Multiplication, Convex Hull.

The Greedy Method - Knapsack Problem, Tree vertex splitting, Job sequencing, with dead lines, Minimum-cost spanning trees, Optimal storage on tapes, Optimal merge pattern, Single source shortest paths.

Unit-III

Dynamic Programming - General method, Multistage graph, All pairs shortest path,

Single-source shortest path, Optimal Binary search trees, String Editing, 0/1 Knapsack, Reliability design, The traveling salesman problem, Flow shop scheduling.

Basic Traversal and Search Techniques - Basic traversal & search techniques - Techniques for binary trees, techniques for graphs, connected components & spanning trees, Bi-connected components & DFS.

Unit-IV

Backtracking - Back tracking - The General Method, The 8-Queens Problem, Sum of subsets, Graph coloring, Hamiltonian cycle, Knapsack problem.

Branch and Bound- The method, 0/1 Knapsack problem, Traveling salesperson, Efficiency considerations.

Prescribed Book:

L Ellis Horwitz, Sartaj Sahani , 'Fundamentals of Computer Algorithms', Universities Press, The following topics in the prescribed book Topics 1,2,3,4,5,6,7,8

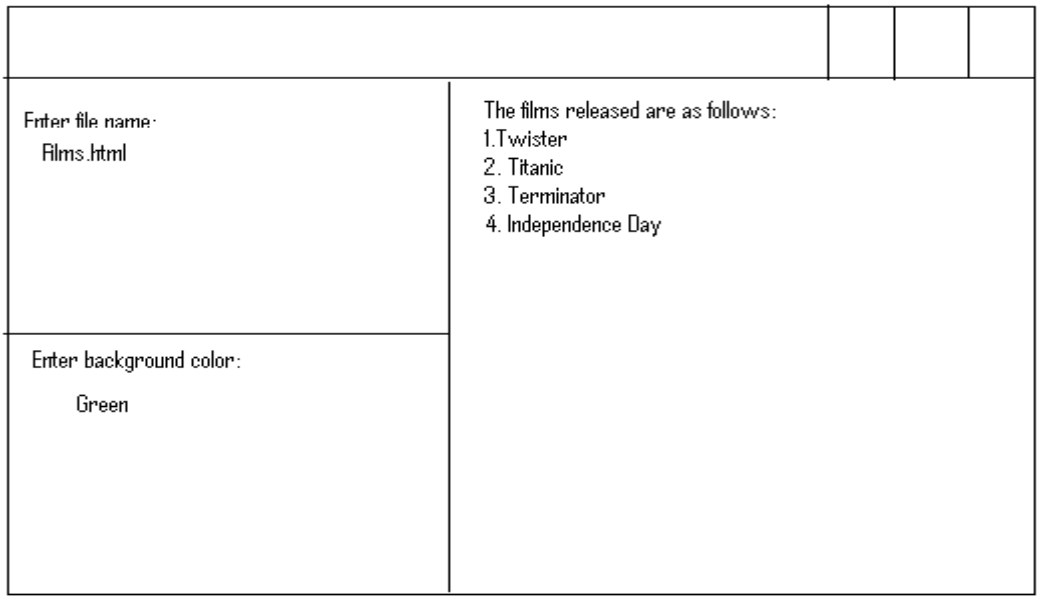
Reference Books:

1. Bases S. & Gelder A.V - computer Algorithms,Addision Wesley(200)
2. Cormen TH et al - Introduction to Algorithms, PHI(2001)
3. Brassard & Bralley - Fundamentals of Algorithms, PHI(2001)

MCS 206 : 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.

MCS 207: DBMS Lab

Lab cycle

Cycle-I: Aim: Marketing Company wishes to computerize their operations by using following tables.

Table Name: Client_Master
Description: This table stores the information about the clients.

Column Name	Data Type	Size	Attribute
Client_no	Varchar2	6	Primary Key and first letter should starts with 'C'
Name	Varchar2	10	Not null
Address1	Varchar2	10	
Address2	Varchar2	10	
City	Varchar2	10	
State	Varchar2	10	
Pincode	Number	6	Not null
Bal_due	Number	10,2	

Table Name:Product_master
Description: This table stores the information about products.

Column Name	Data Type	Size	Attribute
Product_no	Varchar2	6	Primary Key and first letter should starts with 'P'
Description	Varchar2	10	Not null
Profit_percent	Number	2,2	Not null
Unit_measure	Varchar2	10	
Qty_on_hand	Number	8	
Record_lvl	Number	8	
Sell_price	Number	8,2	Not null, can't be 0
Cost_price	Number	8,2	Not null, can't be 0

Table Name: salesman_master
Description: This table stores the salesmen working in the company

Column Name	Data Type	Size	Attribute
Salesman_id	Varchar2	6	Primary Key and first letter should starts with 'S'
Name	Varchar2	10	Not null
Address1	Varchar2	10	
Address2	Varchar2	10	
City	Varchar2	10	
State	Varchar2	10	
Pincode	Number	6	Not null
Sal_amt	Number	8,2	Should not null and zero
Target_amt	Number	6,2	Should not null and zero
Remarks	Varchar2	10	

Table Name: sales_order

Description: This table stores the information about orders

Column Name	Data Type	Size	Attribute
S_order_no	Varchar2	6	Primary Key and fisrt char is 'O'
S_order_date	Date		
Client_no	Varchar2	6	Foreign key
Delve_address	Varchar2	20	
Salesman_no	Varchar2	6	Foreign key
Delve_type	Varchar2	1	Delivery: part(P)/Full(F) and default 'F'
Billed_yn	Char	1	
Delve_date	Date		Can't be less than the s_order_date
Order_status	Varchar2	10	Values in 'IN PROCESS', FULFILLED', 'BACK ORDER, 'CANCELLED'

Table Name: sales_order_details
Description: This table stores the information about products ordered

Column Name	Data Type	Size	Attribute
S_order_no	Varchar2	6	Primary key, foreign key references sales_order table
Product_no	Varchar2	6	Primary key, foreign key references product_master table
Qty_ordered	Number	8	
Qty_disp	Number	8	
Product_rate	Number	10,2	

Table Name: challan_master
Description: This table stores the information about challans made
for orders.

Column Name	Data Type	Size	Attribute
Challan_no	Varchar2	6	Primary key, first two letters must start with 'CH'
S_order_no	Varchar2	6	Foreign key references sales_order
Challan_date	Date		
Billed_yn	Char	1	Values in 'Y', 'N' default 'N'

Table Name: Challan_Details
Description: This table stores the information about challan details.

Column Name	Data Type	Size	Attribute
Challan_no	Varchar2	6	Primary key, foreign key references challan_master table
Product_no	Varchar2	6	Primary key, foreign key references product_master table
Qty_disp	Number	4,2	Not null

Solve the following queries by using above tables.

1. **Retrieve the list of names and cities of all the clients.**
2. **List the various products available from product_master.**
3. **Find out the clients who stay in a city whose second letter is 'a'.**
4. **Find the list of all clients who stay in the city ' CHENNAI' or 'DELHI'.**
5. **List all the clients located at 'CHENNAI'.**
6. **Print the information from sales order as the order the places in the month of January.**
7. **Find the products with description as 'Floppy Drive' and 'Pen drive'.**
8. **Find the products whose selling price is grater than 2000 and less than or equal to 5000.**
9. **Find the products whose selling price is more than 1500 and also find the new selling price as original selling price *15.**
10. **Find the products in the sorted order of their description.**
11. **Divide the cost of product '540 HDD' by difference between its price and 100.**
12. **List the product number, description, sell price of products whose description begin with letter 'M'.**
13. **List all the orders that were cancelled in the month of March.**
14. **Count the total number of orders.**
15. **Calculate the average price of all the products.**
16. **Determine the maximum and minimum product prices.**
17. **Count the number of products having price grater than or equal to 1500.**
18. **Find all the products whose quantity on hand is less than reorder level.**
19. **Find out the challan details whose quantity dispatch is high.**
20. **Find out the order status of the sales order, whose order delivery is maximum in the month of March.**
21. **Find out the total sales made by the each salesman.**
22. **Find the total revenue gained by the each product sales in the period of Q1 and Q2 of year 2006.**

23. Print the description and total qty sold for each product.
24. Find the value of each product sold.
25. Calculate the average qty sold for each client that has a maximum order value of 1,50,000.
26. List the products which has highest sales.
27. Find out the products and their quantities that will have to deliver in the current month.
28. Find the product number and descriptions of moving products.
29. Find the names of clients who have purchased 'CD DRIVE'.
30. List the product numbers and sales order numbers of customers having quantity ordered less than 5 from the order details for the product '1.44 Floppies'.
31. Find the product numbers and descriptions of non-moving products.
32. Find the customer names and address for the clients, who placed the order '019001'.
33. Find the client names who have placed orders before the month of May, 2006.
34. Find the names of clients who have placed orders worth of 10000 or more.
35. Find out if the product is '1.44 drive' is ordered by any client and print the client number, name to whom it is sold.

Cycle-II

Aim: A Manufacturing Company deals with various parts and various suppliers supply these parts. It consists of three tables to record its entire information. Those are as follows

S(SNO,SNAME,CITY,STATUS)
P(PNO,PNAME,COLOR,WEIGTH,CITY,COST)
SP(SNO,PNO,QTY)
J(JNO,JNAME,CITY)
SPJ(SNO,PNO,JNO,QTY)

1. Get Suppliers Names for Suppliers who supply at least one red part.
2. Get Suppliers Names for Suppliers who do not supply part 'P2'
3. Using Group by with Having Clause, Get the part numbers for all the parts supplied by more than one supplier.
4. Get supplier numbers for suppliers with status value less the current max status value.
5. Get the total quantity of the part 'P2' supplied.
6. Get the part color, supplied by the supplier 'S1'
7. Get the names of the parts supplied by the supplier 'Smith' and "Black"
8. Get the Project numbers, whose parts are not in Red Color, from London.
9. Get the suppliers located from the same city.
10. Get the suppliers, who does not supply any part.

11. Find the pnames of parts supplied by London Supplier and by no one else.
12. Find the sno's of suppliers who charge more for some part than the average cost of that part.
13. Find the sid's of suppliers who supply only red parts.
14. Find the sid's of suppliers who supply a red and a green part.
15. Find the sid's of suppliers who supply a red or green part.

Cycle: III

An Airline System would like to keep track their information by using the following relations.

Flights (flno: integer, from: string, to: string, distance: integer,
Price: integer)
Aircraft (aid: integer, aname: string, cruising_range: integer)
Certified (eid: integer, aid: integer)
Employees (eid: integer, ename: string, salary: real)

Note that the employees relation describes pilots and other kinds of employees as well; every pilot is certified for aircraft and only pilots are certified to fly. Resolve the following queries:

1. For each pilot who is certified for more than three aircraft, find the eid's and the maximum cruising range of the aircraft that he (or She) certified for.
2. Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu.
3. Find the name of the pilots certified from some Boeing aircraft.
4. For all aircraft with cruising range over 1,000 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft.
5. Find the aid's of all aircraft than can be used from Los Angels to Chicago.
6. Print the enames of pilots who can operate planes with cruising range greater than 3,000 miles, but are not certified by Boeing aircraft.
7. Find the total amount paid to employees as salaries.
8. Find the eid's of employees who are certified for exactly three aircrafts.
9. Find the eid's of employee who make second highest salary.
10. Find the aid's of all than can be used on non-stop flights
from Bonn to Chennai.

Cycle: IV : Employee Database

Aim: An enterprise wishes to maintain a database to automate its operations. Enterprise divided into to certain departments and each department consists of employees. The following two tables describes the automation schemas

DEPT (DEPTNO, DNAME, LOC)
EMP (EMPNO,ENAME,JOB,MGR,HIREDATE,SAL,COMM,DEPTNO)

1. **Create a view, which contain employee names and their manager names working in sales department.**
2. **Determine the names of employee, who earn more than there managers.**
3. **Determine the names of employees, who take highest salary in their departments.**
4. **Determine the employees, who located at the same place.**
5. **Determine the employees, whose total salary is like the minimum salary of any department.**
6. **Update the employee salary by 25%, whose experience is greater than 10 years.**
7. **Delete the employees, who completed 32 years of service.**
8. **Determine the minimum salary of an employee and his details, who join on the same date.**
9. **Determine the count of employees, who are taking commission and not taking commission.**
10. **Determine the department does not contain any employees.**
11. **Find out the details of top 5 earners of company. (Note: Employee Salaries should not be duplicate like 5k,4k,4k,3k,2k)**
12. **Display those managers name whose salary is more than an average salary of his employees.**
13. **Display the names of the managers who is having maximum number of employees working under him?**
14. **In which year did most people join the company? Display the year and number of employees.**
15. **Display ename, dname even if there no employees working in a particular department(use outer join).**

PL/SQL PROGRAMS

1. **WRITE A PL/SQL PROGRAM TO CHECK THE GIVEN NUMBER IS STRONG OR NOT.**
2. **WRITE A PL/SQL PROGRAM TO CHECK THE GIVEN STRING IS PALINDROME OR NOT.**

3. WRITE A PL/SQL PROGRAM TO SWAP TWO NUMBERS WITHOUT USING THIRD
VARIABLE.

4. WRITE A PL/SQL PROGRAM TO GENERATE MULTIPLICATION TABLES FOR
2,4,6

5. WRITE A PL/SQL PROGRAM TO DISPLAY SUM OF EVEN NUMBERS AND SUM OF
ODD NUMBERS IN THE GIVEN RANGE.

6. WRITE A PL/SQL PROGRAM TO CHECK THE GIVEN NUMBER IS PALLINDROME
OR NOT.

7. THE HRD MANAGER HAS DECIDED TO RAISE THE EMPLOYEE SALARY BY 15%.
WRITE A PL/SQL BLOCK TO ACCEPT THE EMPLOYEE NUMBER AND UPDATE THE
SALARY OF THAT EMPLOYEE. DISPLAY APPROPRIATE MESSAGE BASED ON THE
EXISTENCE OF THE RECORD IN EMP TABLE.

8. WRITE A PL/SQL PROGRAM TO DISPLAY TOP 10 ROWS IN EMP TABLE BASED
ON THEIR JOB AND SALARY.
9. WRITE A PL/SQL PROGRAM TO RAISE THE EMPLOYEE SALARAY BY 10%, FOR
DEPARTMENT NUMBER 30 PEOPLE AND ALSO MAINTAIN THE RAISED DETAILS
IN THE RAISE TABLE.

10. WRITE A PROCEDURE TO UPDATE THE SALARY OF EMPLOYEE, WHO ARE NOT
GETTING COMMISSION BY 10%

11.WRITE A PL/SQL PROCEDURE TO PREPARE AN ELECTRICITY BILL BY USING
FOLLOWING TABLE
TABLE USED: ELECT

NAME	NULL?	TYPE
MNO	NOT NULL	NUMBER(3)
CNAME		VARCHAR2(20)
CUR_READ		NUMBER(5)
PREV_READ		NUMBER(5)
NO_UNITS		NUMBER(5)
AMOUNT		NUMBER(8,2)
SER_TAX		NUMBER(8,2)
NET_AMT		NUMBER(9,2)

12. WRITE A PL/SQL PROCEDURE TO PREPARE AN TELEPHONE BILL BY USING
FOLLOWING TABLE. AND PRINT THE MOTHLY BILLS FOR EACH CUSTOMER
TABLE USED : PHONE.

NAME	NULL?	TYPE
TEL_NO	NOT NULL	NUMBER(6)
CNAME		VARCHAR2(20)
CITY		VARCHAR2(10)
PR_READ		NUMBER(5)
CUR_READ		NUMBER(5)
NET_UNITS		NUMBER(5)
TOT_AMT		NUMBER(8,2)

13. WRITE A PL/SQL PROGRAM TO RAISE THE EMPLOYEE SALARY BY 10%, WHO
ARE COMPLETED THERE 25 YEARS OF SERVICE AND STORE THE DETAILS AT
PPROPRIATE TABLES (DEFINE THE RETAIR_EMP TABLE).

14. WRITE A PL/SQL PROCEDURE TO EVALUATE THE GRADE OF A STUDENT WITH
FOLLOWING CONDITIONS:

FOR PASS: ALL MARKS > 40
FOR I CLASS: TOTAL%>59
FOR II CLASS: TOTAL% BETWEEN >40 AND <60
FOR III CLASS: TOTAL% =40
AND ALSO MAINTAIN THE DETAILS IN ABSTRACT TABLE.

TABLES USED
1. TABLE STD

NAME	NULL?	TYPE
NO	NOT NULL	NUMBER
NAME		VARCHAR2(10)
INTNO		NUMBER
CLASS	NOT NULL	VARCHAR2(10)
M1		NUMBER
M2		NUMBER
M3		NUMBER
M4		NUMBER
M5		NUMBER

2. TABLE ABSTRACT

NAME	NULL?	TYPE
STDNO		NUMBER
STDNAME		VARCHAR2(10)
CLASS		VARCHAR2(10)
MONTH		VARCHAR2(10)
INTNO (INTERNAL NUMBER)		NUMBER
TOT		NUMBER
GRADE		VARCHAR2(10)
PERCENT		NUMBER
DAT_ENTER		DATE

15. CREATE AN VARRAY, WHICH HOLDS THE EMPLOYEE PHONE NUMBERS (AT LEAST THREE NUMBERS)

16. CREATE AN OBJECT TO DESCRIBE THE DETAILS OF ADDRESS TYPE DATA.

17. WRITE A PL/SQL PROCEDURE TO READ THE DATA INTO THE TABLE AS PER THE FOLLOWING DESCRIPTION

Attribute Name	Data Type	DETAILS
EMPLOYEE NUMBER	NUMBER	
EMPLOYEE NAME	CHARACTER	
ADDRESS	OBJECT	STREET NUMBER
STREET NAME		
TOWN		
DIST AND STATE		
QUALIFICATION	CHARACTER	
PHONE NUMBER	OBJECT-VARRAY	HOLDS THREE PHONE NUMBER

MCS 208: Communication Skills

Prescribed Books :

1. Raymond Murphy, "Essential English Grammar", Second Edition,
   Cambridge University Press (2008)

2. Leena Sen, "Communication Skills", Second Edition, PHI (2008)

Reference Books :

1. Aysha Viswamohan, "English for Technical Communication", TMH (2008)

2. P. Kiranmai Dutt, Geetha Rajeevan, "Basic Communication Skills", Foundation Books (2007)

3. T.M. Farhathullah, "Communication Skills for Technical Students", Orient Longman (2002)

4. E.Suresh Kumar, P. Sreehari, "Communicative English", Orient Longman (2007)

MCS301- Java ADVANCED PROGRAMMING

UNIT-I:

Introduction to Advanced Java Programming

OverView of the Java Platform, A Brief History of the Java Platform, Object-Oriented Programming in Java,Standard SDK Tools,Javadoc Comments, Packaging Programs for Distribution,Building a Program with Application Developer,Recent Additions to the Java 2 Platform.

Classes and Objects

Introduction, classes and Object-Oriented Programming,Using Constructors and Finalizers,Reference Objects and the Garbage Collector, Cloning Objects,Run-Time Type Information,Casting Between Types,Using the Reflection API, Nested Classes and Interfaces,Inner Classes, Local Inner Classes,Anonymous Local Inner Classes,Class Files for Nested and Inner Classes.

Input/Output Serialization.

How Java Platform Supports I/O, Programming I/O, Byte-Oriented Stream Classes,File I/O Basics, Character Streams, The New I/O Programming Interface, Object Serialization

UNIT-II

Common Elements of Graphical User Interfaces *:* Introduction, Main features and Technology of GUI, Introducing the Java foundation classes, Event Model, JFC Sample programs, Layout managers, Events

Java Beans :

Introduction,JavaBeans Component Model,Bean Development Environments,Using the Sun BeanBox, Creating a JavaBean Class,Exploring JavaBEan Property Types,Adding Custom Event Types,Creating a JavaBean Class with Events,Using the BeanInfo Classes.

Using Relational Databases :

Introduction, Best Practices for Programming for Databases,JDBC Drivers for RDBM Systems,SQL to Java Type Mapping, Using the java.sql API, Coding Transactions, Using the Javax.sql API, connection pooling

UNIT-III

Networking Programming

Introduction, Working with URLs, Working with Sockets, Remote Method Invocation

Building Web Application

Introduction, The Techology of the Web,Servlets,The Servlet API

UNIT IV

Enterprise JavaBeans

Introduction, Enterprising Programming,What are EJBs,session EJBs, EJB Clients, Entity EJBs,Message-Driven Beans,EJB Transaction Characterstics,EJB security.

.

Prescribed Books :

Joe Wiggles Worth and Paula Mc Millan, "Java programming: Advanced Topics", Third Edition,Thomson,

Reference Books :

1. .Ivor Horton’s, “Beginning Java 2- JDK 5 Edition”, Wrox (2008)

2. Joel Murach,Andrea Steelman “Java SE 6” , SPD

3. Cay Horstmann, “BIG JAVA- Compatible with Java 5 & 6”, Third Edition,WILEY

Model Question Paper

M.Sc.(Computer Science)
III SEMESTER
MCS-301: Advanced Java Programming
Time:3Hrs **Max. Marks:80**

ANSWER ALL THE QUESTIONS, All questions carry equal marks

(I).Answer all the following questions.
Write Short Notes on

(a).Object Oriented Programming (2M)

(b).Finalizers (2M)

(c).Creating a JavaBean Class (2M)

(d).Using a Precompiled SQL (2M)

(e).Datagram Sockets (2M)

(f).HTTPS Protocols (2M)

(g).Named and Anonymous Servlets (2M)

(h).EJB Clients (2M)

UNIT –I

(II). (a).Explain about classes and Object Oriented Programming (8M)

(b). Explain about Nested Classes and Interfaces. (8M)

(0R)

(c). Explain about Byte –Oriented Stream Classes (8M)

(d). Explain about File Navigation Method. (8M)

UNIT –I I

(III). (a). Explain about Exploring Java Bean Property Types (8M)

(b). Explain about Using the Beaninfo Classes (8M)

(OR)

(c). Explain about JDBC Drivers for RDBM System (8M)

(d). Explain about Establishing the Database Connection (8M)

UNIT-III

(IV). (a). Explain about Working with Sockets (8M)

(b). Explain about Remote Method Invocation. (8M)

(OR)

(c). Explain about Web Servers and Application Servers (8M)

(d). Explain about Servlets (8M)

UNIT-IV

(V). (a). Explain about Building and Running the EJB samples.
(8M)

(b). Explain about Session EJBs.
(8M)

(OR)

(c). Explain about J2EE Client Applications,
(8M)

(d). Explain about EJB to Database Schema Mapping.
(8M)

MCS 302 : .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).

Model Paper

MCS 302: .Net Programming
Time: 3 Hrs **Max. Marks: 80**

Answer all the following questions. Each Question Carries 16 Marks.

1.a) Define data binding
b) Explain login controls
c) What is master page
d) Describe Data Adapter
e) Explain docking and anchoring controls
f) Give the difference between check box radio button and group box controls
g) Define event and write different types of event
h) What are the characteristics of interface

Unit-I

2.a) Briefly explain about data types and keywords.
b) Write the procedure for an application which checks whether the entered user is valid or not.
(Or)
c) Explain the following controls
i. Menus
ii. Timer
iii. PictureBox
iv. Tree view
c) Explain mouse events and key board events.

Unit-II

3. a) Explain all the validation controls.
b) Write the procedure to design the application which allows the valid user to enter into it.
(or)
c) Briefly explain about master pager and themes
d) With suitable example explain the navigation controls.

Unit-III

4.a) What are the concepts of object oriented programming.
b) Explain the following controls
i. ComboBox
ii. ListBox
iii. Panel
iv. Builtin dialogBox
(or)
c) Explain the steps involved in windows form design and interface
d) Write the procedure for coffee shop billing application (use checkbox)

Unit-IV

5.a) What is data binding? Explain the types of data binding how data binding can be implemented.
b) What are the ADO.NET objects.
(or)
c) Develop an application for student details which
i. Can access database
ii. Can bound to the controls
iii. Can display the details in a form

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MCS 303 : 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).

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

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

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

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

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

Model Paper

MCS 303 : Object Oriented Modeling and Design with UML

Time: 3 Hrs **Max. Marks: 80**

Answer the following questions. Each question carries 16 Marks.

1.a) Distinguish between object diagram and ER-diagram.
b) Define Meta class.
c) Distinguish between Aggregations versus generalization.
d) Explain Constraints.
e) What is analysis document?

f) Need for State-transition diagram?

g) Define modeling?
h) What is multiplicity?

Unit-I

2.a) What is Modeling? What are different Object Modeling Techniques.
b) Discuss how was object oriented development methodology is different from Traditional approach.

(or)

c) Explain the following terms:
i. Association.
ii. Aggregation.
iii. Generalization.
iv. Composition.

Unit-II

3.a) What is State modeling? How does dynamic behavior of a system Represented ?
b) What is an Event? Discuss about types of Events with example?

(or)

c) What is Use Case? How was Use Case diagrams were helpful in Analysis of a System.
d) What is Concurrency? Discuss the concurrency with the help of an example.

Unit-III

4.a) Discuss about the steps involved in Analysis of a System.

(or)

b) Define state diagram for ATM Model.
c) Discuss about nested state diagram.

Unit-IV

5.a) What is the task of a design? How would you differentiate a good design from bad design?
b) Discuss about System Testing?

(or)

c) Discuss the programming style in the large complex systems.
d) Discuss about good programming style.

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MCS 304.1 : 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)

Model Paper

MCS 304.1 : Grid and Cluster Computing

Time: 3Hrs. **Max. Marks: 80**

Answer ALL Questions: Each Question Carries Equal Marks

1.

a) What is e-science?
b) Compare Globus and Legion.
c) What is a Web Service?
d) Write different categories of Clusters.
e) Define Cluster middleware.
f) Compare Gigabit Ethernet with ATM.
g) What is a Watchdog timer?
h) What is double faulting?

UNIT – I

2. a) What is metacomputing? What is its relationship with the grid?
b) What is datagram architecture? Explain its main features.

(or)

c) Compare and contrast Condor, CondorG, Nimrod, NimrodG and NMI.
c) What are the objectives, functions and achievements of Global Grid Forum (GGF)?

UNIT - II

3. a) Explain what is SOA and how it functions?
b) What is WSRF? What are its benefits? Where is it available?

(or)

c) Explain the architecture and functionality modules of Globus Toolkit (GT4).
d) How does grid enable a DBMS?

UNIT - III

4. a) What is Cluster computing ? Why is it needed?
b) Explain Cluster middleware design objectives.

(or)

c) Explain Condor architecture.
d) What are the different design issues in interconnection Networking/Switching?

UNIT - IV

5. a) How to setup a simple cluster? What are the design considerations for the front end of a cluster?
b) Explain the various cluster architectures and configuration for high availability.

(or)

c) Explain static and dynamic load sharing approach.
d) What is DSM? Why is it required in cluster and what are the various issues in DSM?

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MCS 304.2: 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

Model Paper

MCS 304.2: Microprocessors and Interfacing

Time: 3 Hrs **Max. Marks: 80**

Answer all the following questions. Each question carries 16 marks.

1.a) Role of address lines.
b) Difference between control flag and status flag.
c) Give and explain the instruction to access stack pointer.
d) Difference between INT and INTO instructions.
e) Why an interfacing is required.
f) Difference between Pentium and Pentium MMX.
g) What is the width of Pentium address bus?
h) Any two differences between 80386 and 80486.

UNIT - I

2.a) Explain addressing modes of 8086 with suitable example.
b) Describe the memory segmentation in 8086.
(or)
c) With suitable example explain data transfer and logical group instructions of 8086.
d) Explain different assembler directives of 8086 assembler.

UNIT - II

3.a) Explain the concept of stack.
b) How 8086 macro's are declared and used in the program.
(or)
c) Describe interrupt I/O.

UNIT – III

4.a) Draw and explain timing diagram for input operation in 8086 minimum mode.
b) Explain operation of 8086 in its maximum mode.
(or)
c) Draw and explain functions of 8255A programmable peripheral interface.

UNIT - IV

5.a) Described Architectural details of Pentium processor.
(or)
b) Described the architectural details of 80486.

MCS 305.1 - CRYPTOGRAPHY & NETWORK SECURITY

UNIT I

Introduction

SecurityTrends,OSI security Architecture ,security attacks,security services, security mechanisms,A model for network security

Conventional Encryption : Classical Techniques

Symmetric cipher model ,substitution techniques ,transposition techniques,rotor machines ,steganography

Conventional Encryption : Modern Techniques

Block cipher principles,DES,strength of DES,Differential and linear cryptanalysis ,Block cipher design principles

UNIT II

Confidentiality using Symmetric encryption

Placement of encryption function,traffic confidentiality,key distribution,random number generation

Public - key cryptography & RSA

Principles of Public key crypto systems ,RSA algorithm ,Key management ,Diffie Hellman key exchange ,elliptic curve cryptography

UNIT III

Message authentication and Hash functions

Authentication requirements , Authentication functions,Message Authentication codes,Hash functions,Security of MAC's and hash functions

Digital signatures and Authentication Protocols

Digital signatures , Authentication Protocols,DSS

UNIT IV

Electronic Mail Security : PGP, S/MIME

IP Security :

IP Security Overview, IP Security architecture,Authentication header,encapsulating security payload,combining security associations,key management.

Fire Walls :Firewall design principles ,trusted systems

Prescribed Book:

William Stallings : Cryptography & Network Security Principles and Practices 4th Edition Pearson Education

Chapters : 1,2,3,7,8,9,10,11,13,15,16,20

Reference Books:

Bruce Schneier - Applied Cryptography - Wiley - second edition

Davies & Price : Security for computer Networks, Wilsey (1984)

M.Sc.Degree Examination
Third Semester
Paper: MCS 305.1: CRYPTOGRAPHY AND NETWORKING SECURITY
Time: 3 Hours **Max. Marks: 80**

1. Answer the following briefly. 8X2 =16
(a) Define Avalanche effect.
(b) Explain digital signature.
(c) Explain S/MIME.
(d) What is a firewall.
(e) Differentiate between Symmetric encryption and Public key cryptography.
(f) What are the two keys used for public key encryption?
(g) What is firewall?
(h) State Fermats Theorem

UNIT – I

2. (a) Discuss about playfair and hill cipher techniques. 8M
(b) Briefly explain about DES encryption algorithm. 8M
(Or)
(c) Define OSI security Architecture 8M
(d) Discuss about random number generation techniques in cryptography. 8M

UNIT – II

3.(a) Explain RSA algorithm 8M
(b) Perform encryption and decryption using RSA algorithm 8M for the following p=3, q=11, d=7, M=5
(Or)
(c) Discuss Diffie hellman key exchange algorithm 8M
(d) Differentiate between Link level and End to end encryption 8M

UNIT – III

4. (a) Explain in detail about authentication requirements. 8M
(b) Define Message authentication codes and its requirements 8M
(Or)
(c) Explain about Digital signature standard (DSS). 8M
(d) List out the uses of hash functions. 8M

UNIT – IV

5. a) Write short notes on Firewalls and list various types of firewalls 8M
b) Explain the usage of Pretty good privacy 8M
(or)
c) Explain IPSecurity in detail 16M

MCS 305.2 - COMPUTER GRAPHICS

UNIT - I
Introduction - Nature & types of computer graphics, features of computer graphics, computer aided design, entertainment, visualization, image processing, graphical user interfaces

Overview of Graphics Systems - Video Display Devices, Refresh Cathode Ray tubes, Raster scan displays, Random scan displays, color CRT monitors, Raster scan systems, random scan systems, graphics monitors and workstations, input devices, hard copy devices, graphics software

Output Primitives and Attributes - Points and lines, Line Drawing algorithms - DDA, Bresenhams, Circle generating algorithm, ellipse generating algorithm, pixel addressing, filled area primitives - inside - outside tests, boundary fill, flood fill, scan line polygon fill algorithm, character generation, antialiasing

Unit - II

Two Dimensional Geometric Transformations and Viewing - Basic transformations, matrix representation and homogeneous coordinates, composite transformations, other transformations, viewing pipeline, window to viewport coordinate transformation, clipping operations, line clipping - cohen sutherland line clipping, polygon clipping - sutherland hodgeman polygon clipping

Unit - III

Graphical User Interfaces & Interactive Input Methods - Input of graphical data, logical classification of input devices, input functions, input modes, interactive picture construction techniques.

3D Concepts and Object Representations :- 3D display methods, parallel projection, perspective projection, visible line and surface identification, polygon surfaces.

UNIT - IV
3D Geometric & Modeling transformations:- Translation, Rotation, Scaling, Other Transformations, Composite transformations, Modelling & coordinate transformations, parallel projection, perspective projection.
Visible surface detection methods - Classification of visible surface detection methods, Backface detection, Depth buffer method, Scanline method, Depth sorting method, Area subdivison method.
Text Book:
Donald Hearn & Pauline M.Baker - Computer Graphics - 2nd Edition-PHI

Reference Book:

Foley, Van Dam, Feiner and Hughes, Computer Graphics, Principles and Practice - 3rd Edition, 1999
N.Krishnamurthy - Introduction to Computer Graphics

M.Sc.(Computer Science)
III SEMESTER

MCS 305.2: Computer Graphics

Model Question Paper

Time: 3Hrs Max. Marks: 80

ANSWER ALL THE QUESTIONS
8x2=16m

1. Explain the following terms.
   a) Define Pixel and Frame buffer.
   b) What is aspect ratio?
   c) Define viewport.
   d) What is rubber bonding?

e) What is event handling?
f) What are the graphics primitive operations?
g) Define a viewport.
h) Discuss about non-refreshing display devices.

2. Answer any one of the following

a) Describe the Bresenham's algorithm for circle generation. 8m
b) Explain briefly about random scan, raster scan systems and color CRT monitors 8m

OR

c) Explain polygon-filling methods. 8m
d) Write simple DDA algorithm for straight lines. Find the co-ordinates of the points plotted by this algorithm while drawing a line from (-3,2) to (4, -2). Show your working. 8m

3. Answer any one of the following

a) Describe the two dimensional transformations of translators, rotation and scaling. 8m
b) Obtain the transformation matrix for performing the three transformations in the order given i) reflection in the line y = -x.
ii) translation by (2,3) and scaling by (3,2) 8m

OR

c) Describe sutherland-Hodgerman algorithm for polygon clipping. 8m
e) Explain the terms :
Windowing and clipping. 8m

4. Answer any one of the following

a) Explain various interactive picture construction techniques. 8m
b) Explain various logical classifications of I/P devices. 8m

OR

c) What are the various types of projections? Explain. 8m
d) What are homogenous coordinates? How are they useful in ransformations? 8m

5. Answer any one of the following

a) Derive 3D transformations of translations, rotation and scaling. 8m
b) Derive 3D-rotation transformation matrix about on arbitrary axis. 8m

OR

c) Explain Hidden surface removal. 8m
d) Describe scanline method for hidden surface removal. 8m

MCS 306 : 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

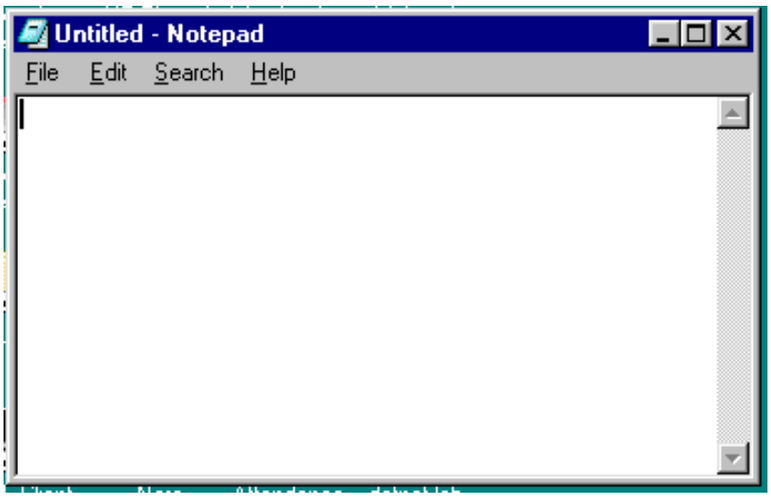
5. Write a program to have chat application
   a) TCP b) UDP
6. Write a program to add Cookie and get Cookie.
7. Write a program to print the Fibonacci numbers using **RM**I.
8. Develop Multithreaded Message Application Using **Java Sockets**
9. Develop Multicast Communication using **Java Multicast 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.

MCS 307 : . Net Programming Lab

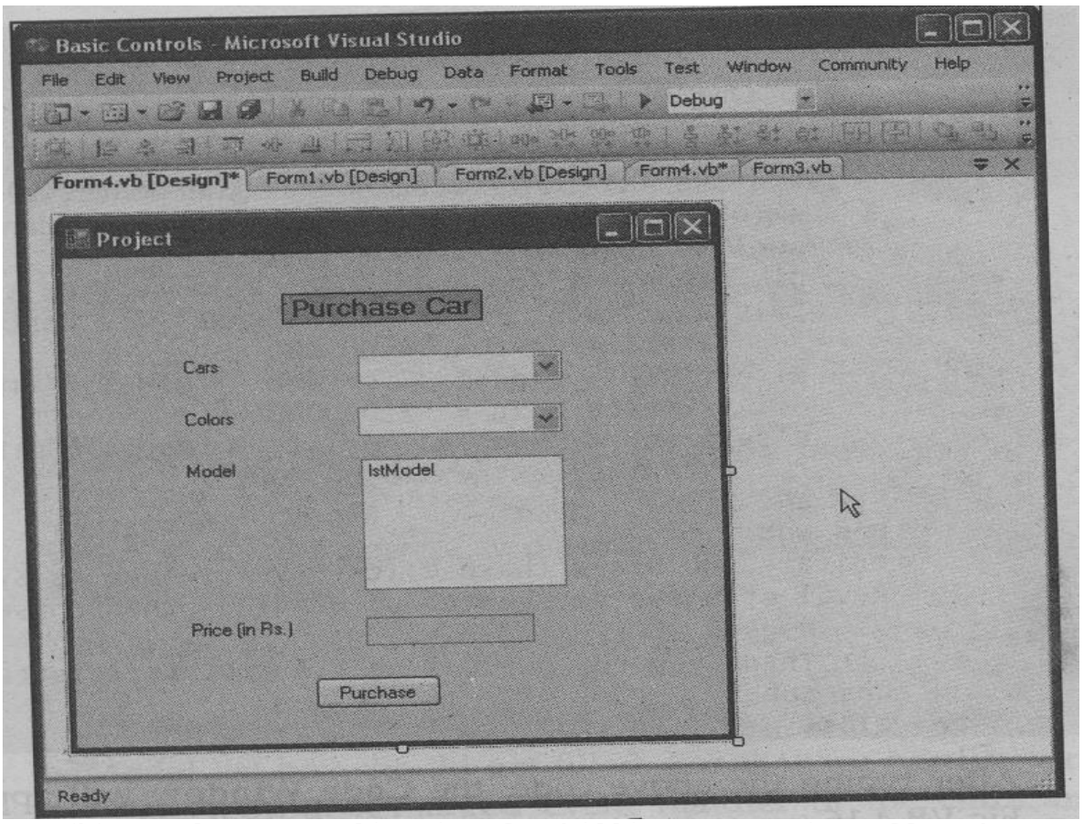
Lab Cycle

VB .NET:

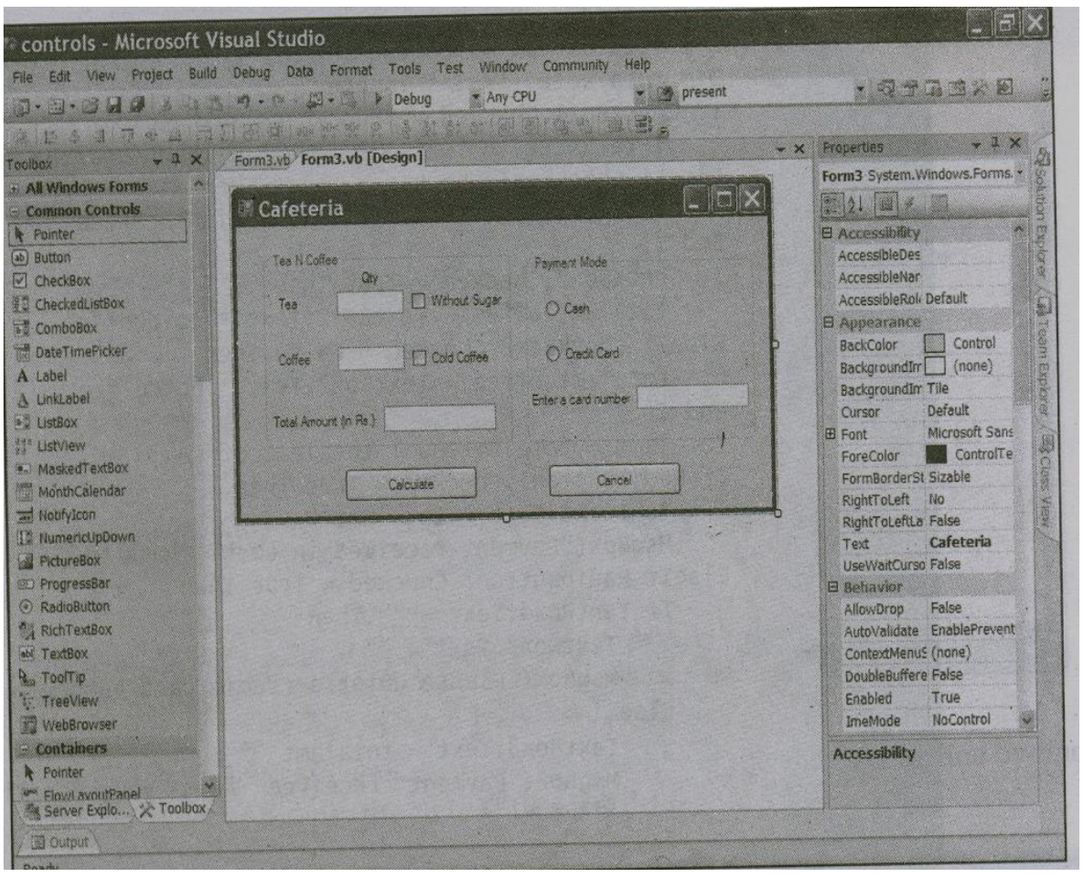
1) Develop an application which is similar to “Notepad” using menus.



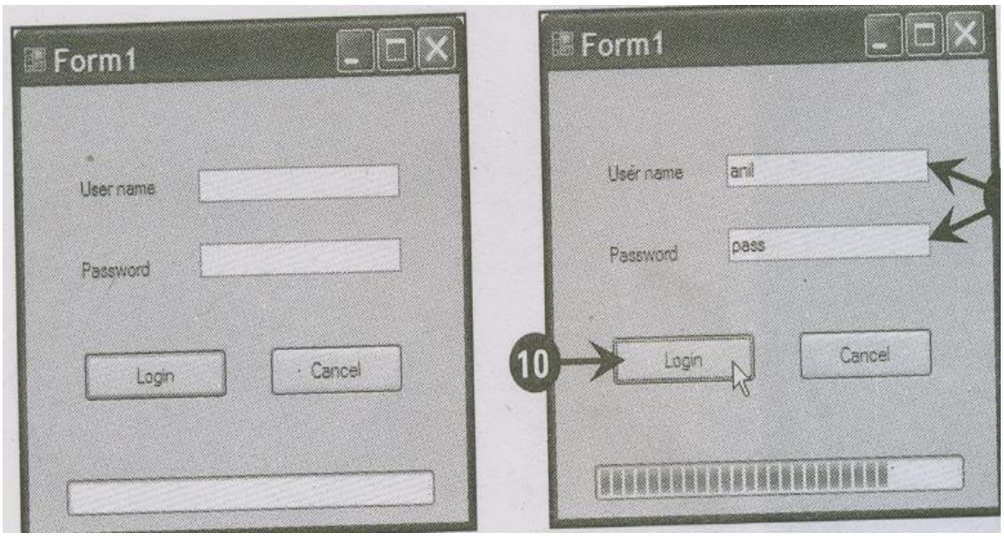
2) (a) Develop an application for facilitating purchasing order which will look like as shown below :



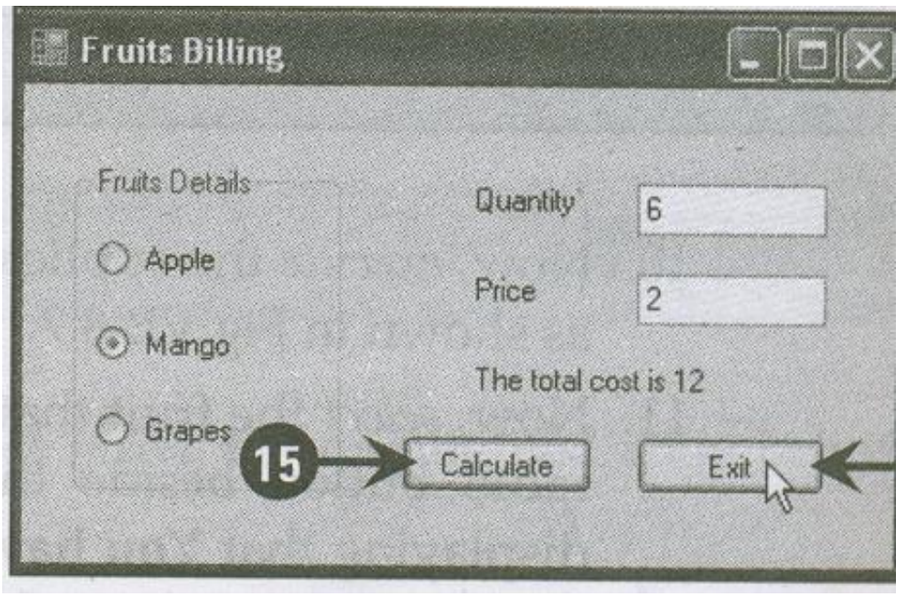
(b) Develop an application for billing system in coffee shops which will look like as shown below :



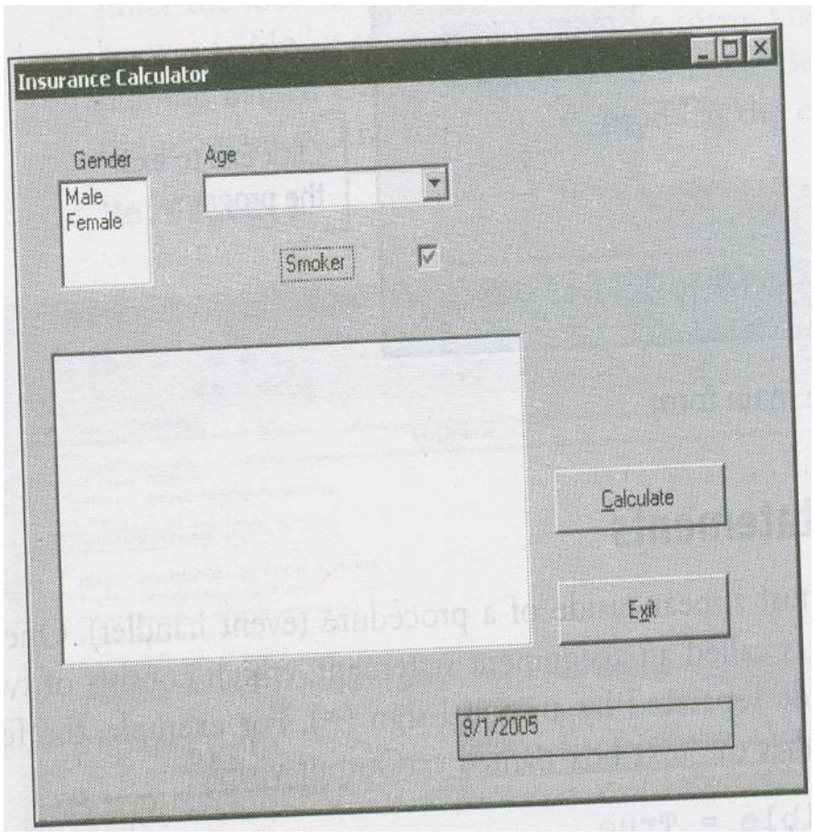
3) (a) Develop an application which is similar to login form including the progress bar controls.



(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

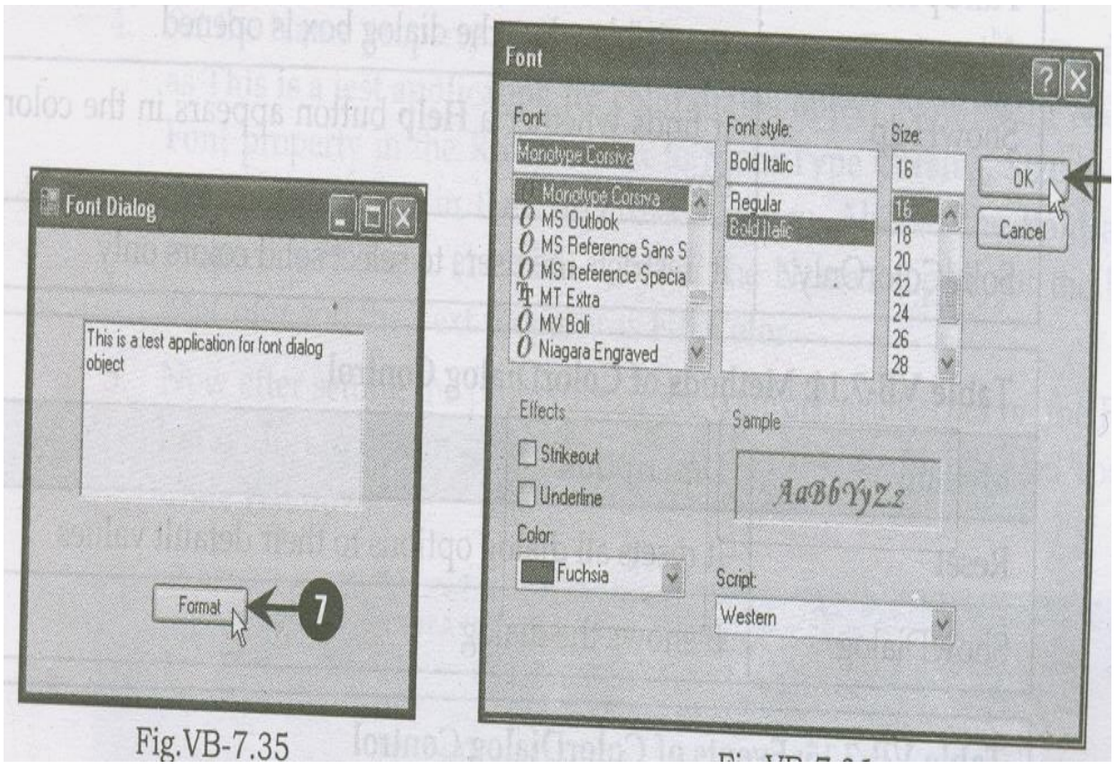


Fig.VB-7.35

(b) Develop an application using color dialog control

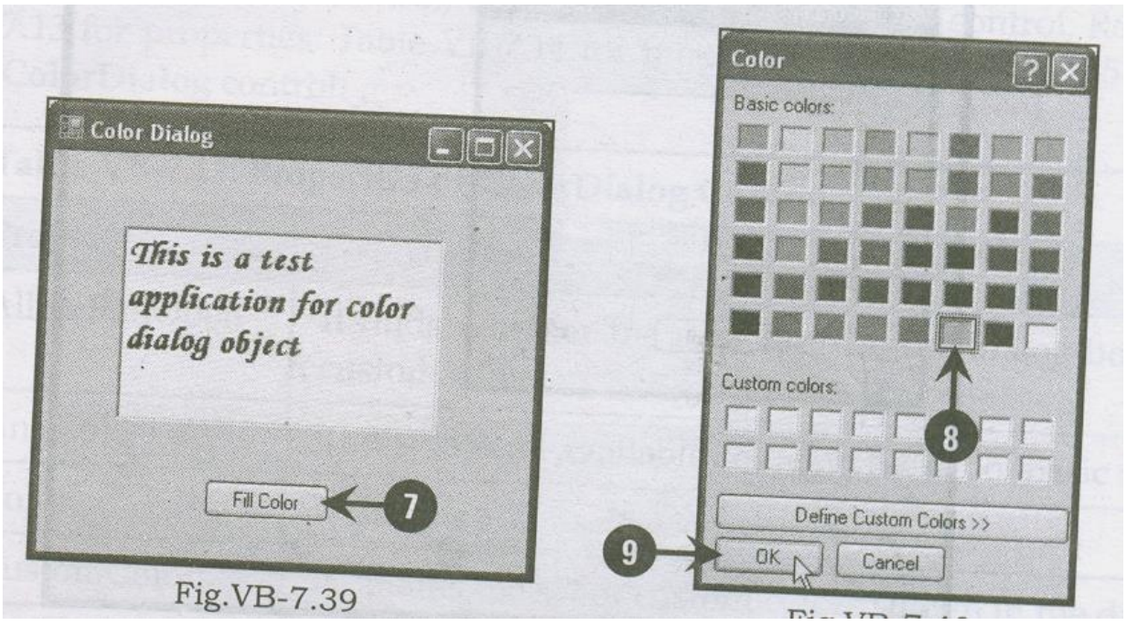


Fig.VB-7.39

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

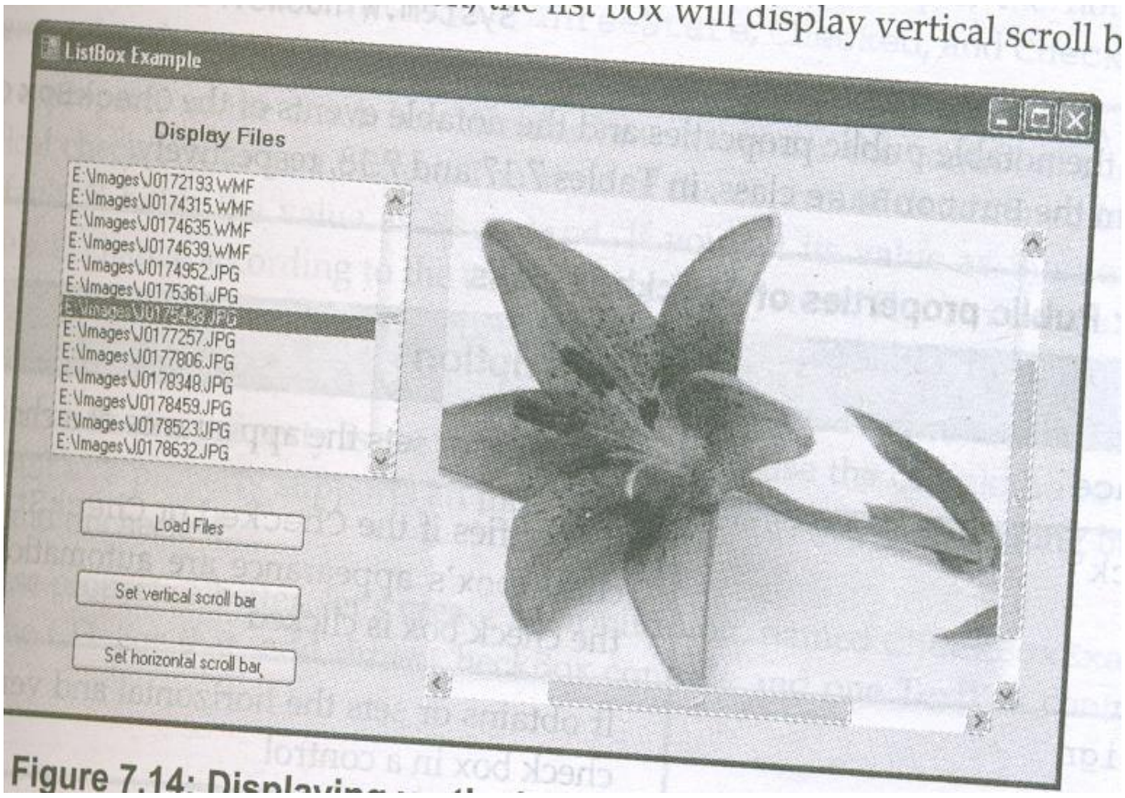
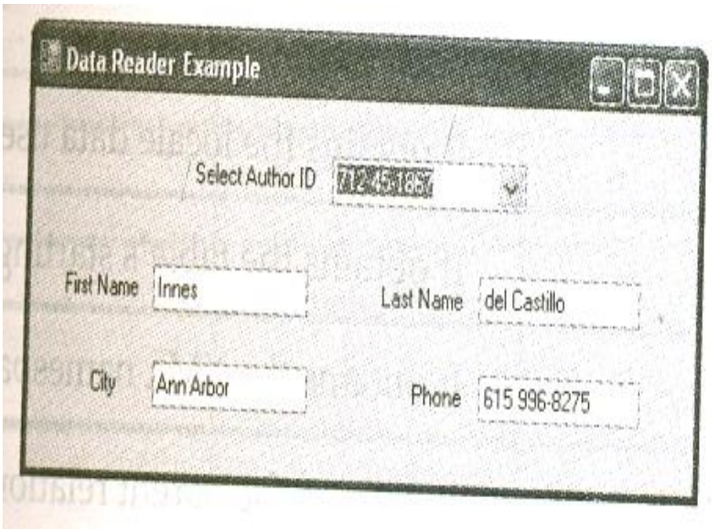


Figure 7.14: Displaying

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.

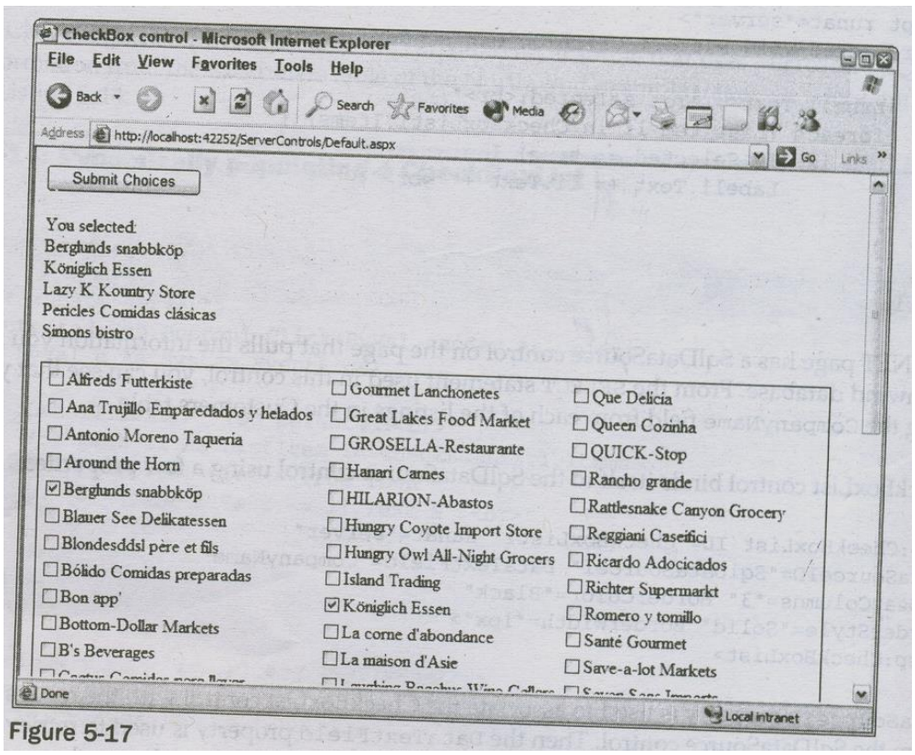


Figure 5-17

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

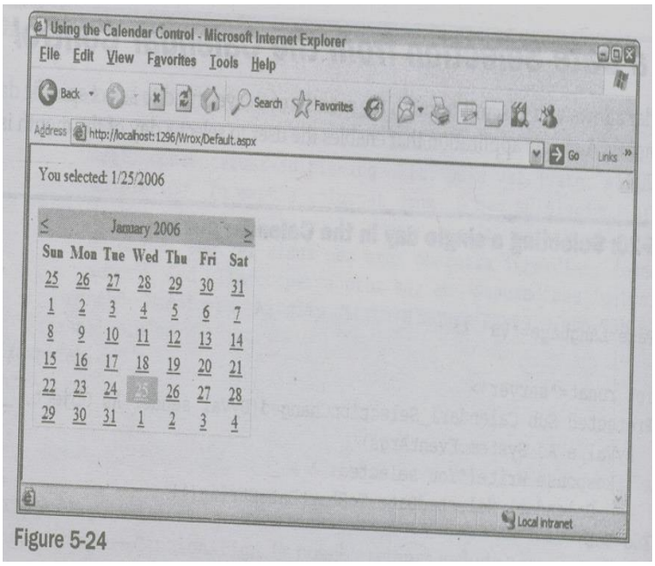
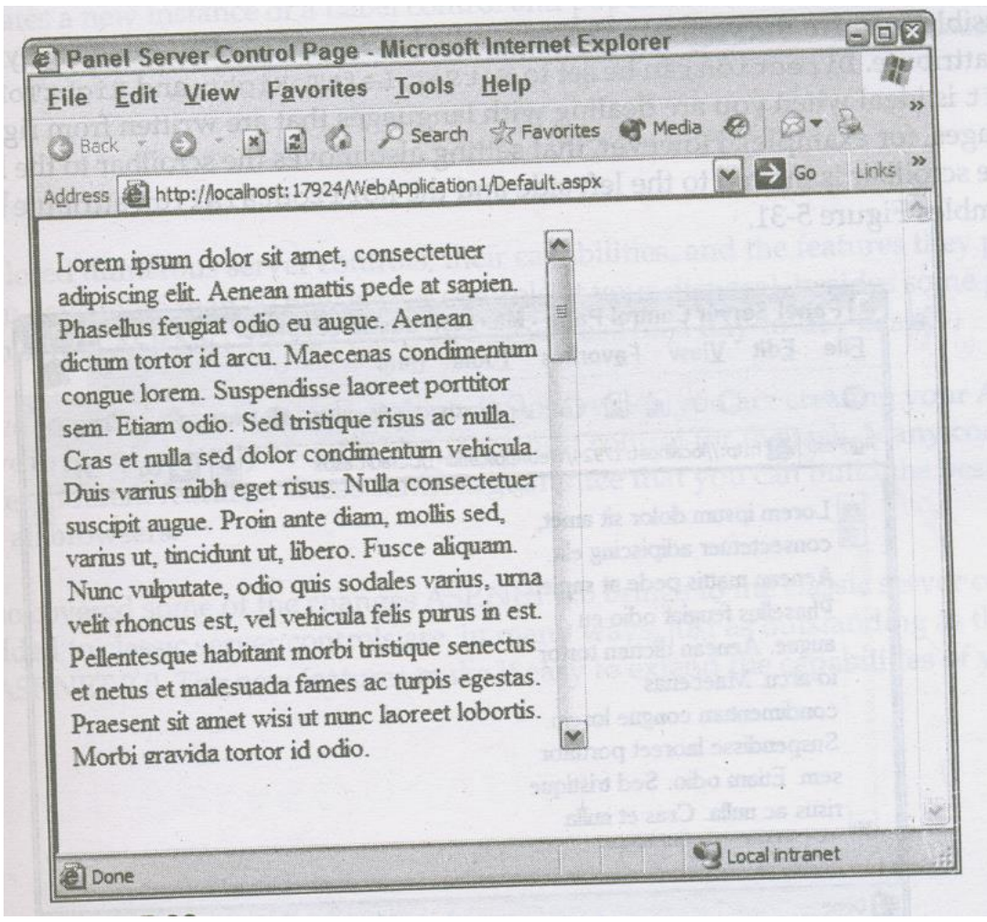


Figure 5-24

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.

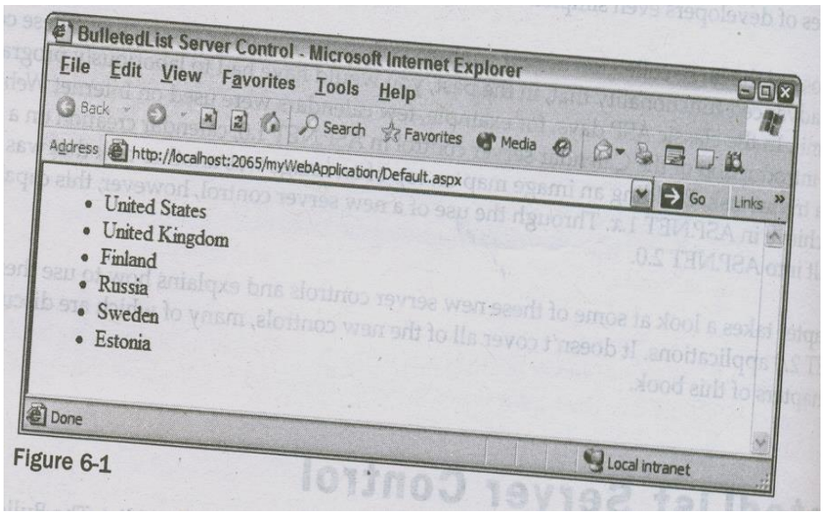
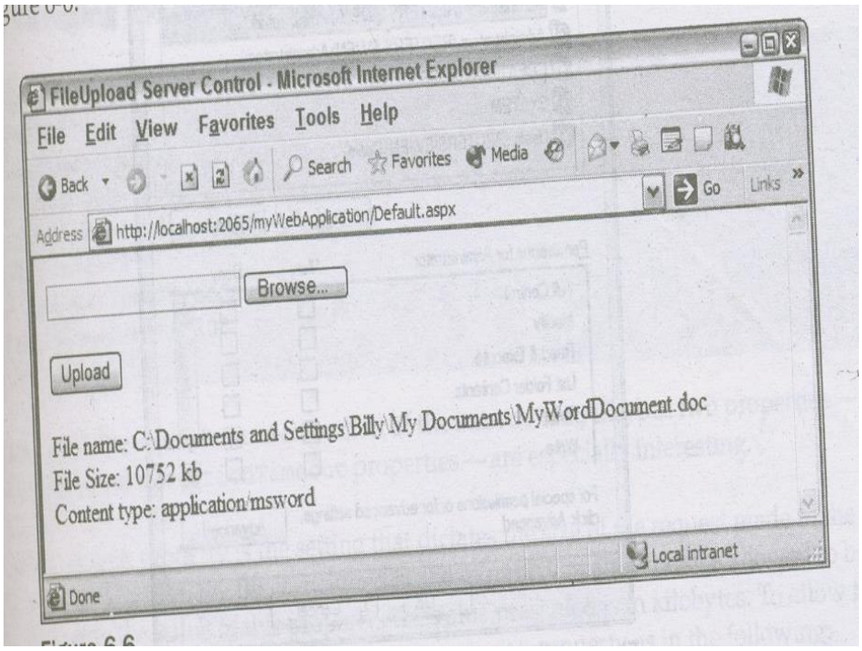
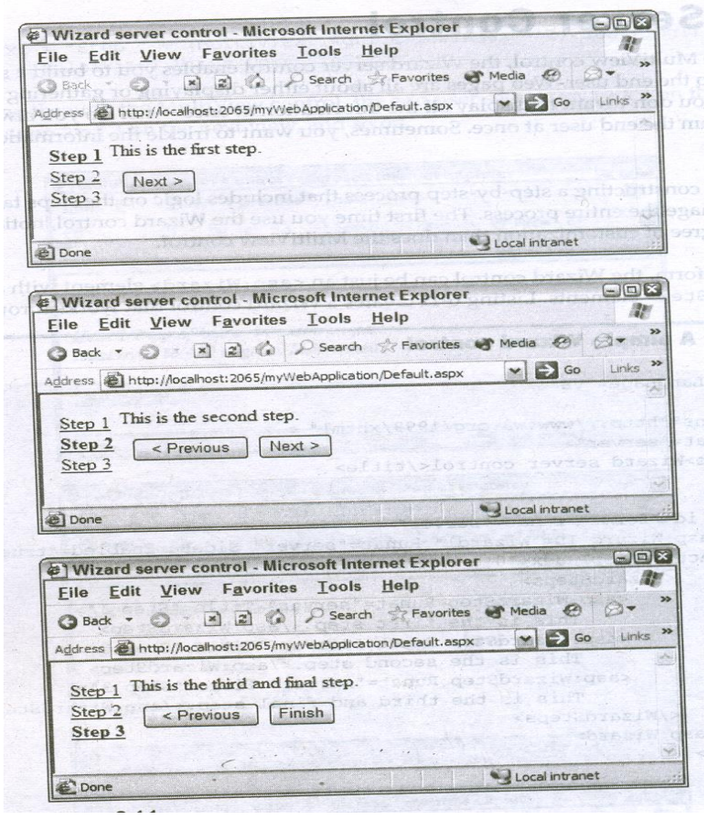


Figure 6-1

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.

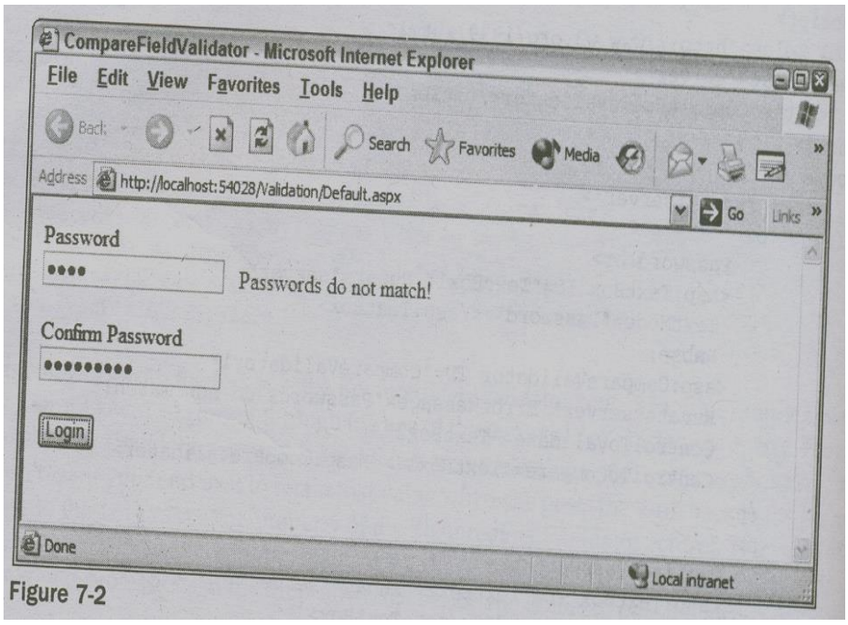


Figure 7-2

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

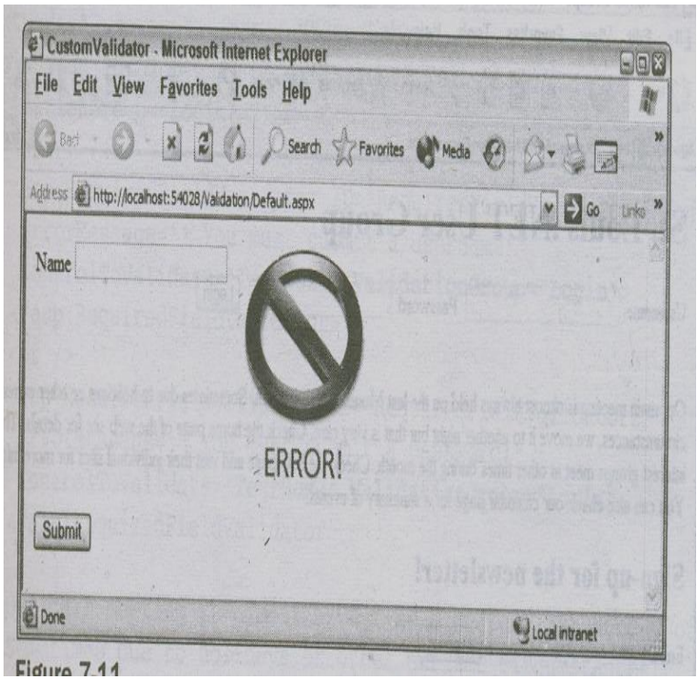
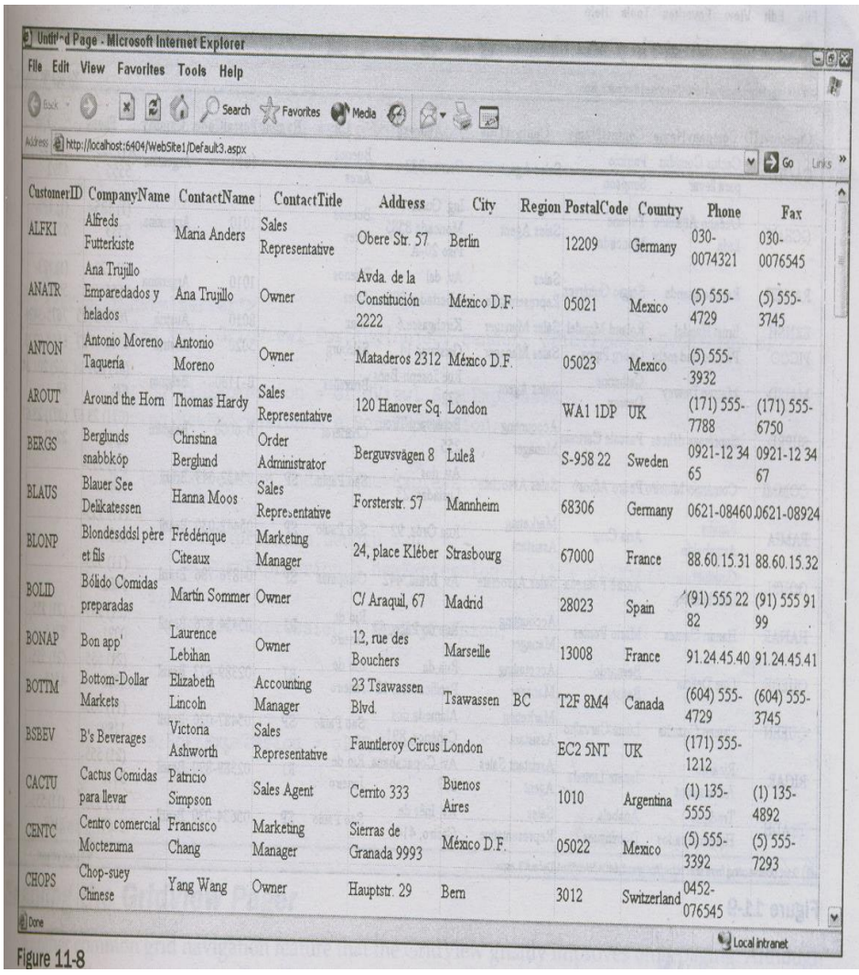


Figure 7.11

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



CustomerID	CompanyName	ContactName	ContactTitle	Address	City	Region	PostalCode	Country	Phone	Fax
ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representative	Obere Str. 57	Berlin		12209	Germany	030-0074321	030-0076545
ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Owner	Avda. de la Constitución 2222	México D.F.		05021	Mexico	(5) 555-4729	(5) 555-3745
ANTON	Antonio Moreno Taquería	Antonio Moreno	Owner	Mataderos 2312	México D.F.		05023	Mexico	(5) 555-3932	
AROUT	Around the Horn	Thomas Hardy	Sales Representative	120 Hanover Sq.	London		WA1 1DP	UK	(171) 555-7788	(171) 555-6750
BERGS	Berglunds snabbköp	Christina Berglund	Order Administrator	Berguvsvägen 8	Luleå		S-958 22	Sweden	0921-12 34 65	0921-12 34 67
BLAUS	Blauer See Delikatessen	Hanna Moos	Sales Representative	Forsterstr. 57	Mannheim		68306	Germany	0621-08460	0621-08924
BLONP	Blondesddsl père et fils	Frédérique Citeaux	Marketing Manager	24, place Kléber	Strasbourg		67000	France	88.60.15.31	88.60.15.32
BOLID	Bólido Comidas preparadas	Martín Sommer	Owner	C/ Araquil, 67	Madrid		28023	Spain	(91) 555 22 82	(91) 555 91 99
BONAP	Bon app'	Laurence Lebihan	Owner	12, rue des Bouchers	Marseille		13008	France	91.24.45.40	91.24.45.41
BOTTM	Bottom-Dollar Markets	Elizabeth Lincoln	Accounting Manager	23 Tsawassen Blvd.	Tsawassen	BC	T2F 8M4	Canada	(604) 555-4729	(604) 555-3745
BSBEV	B's Beverages	Victoria Ashworth	Sales Representative	Fauntleroy Circus	London		EC2 5NT	UK	(171) 555-1212	
CACTU	Cactus Comidas para llevar	Patricio Simpson	Sales Agent	Cerrito 333	Buenos Aires		1010	Argentina	(1) 135-5555	(1) 135-4892
CENTC	Centro comercial Moctezuma	Francisco Chang	Marketing Manager	Sierras de Granada 9993	México D.F.		05022	Mexico	(5) 555-3392	(5) 555-7293
CHOPS	Chop-suey Chinese	Yang Wang	Owner	Hauptstr. 29	Bern		3012	Switzerland	0452-076545	

Figure 11-8

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

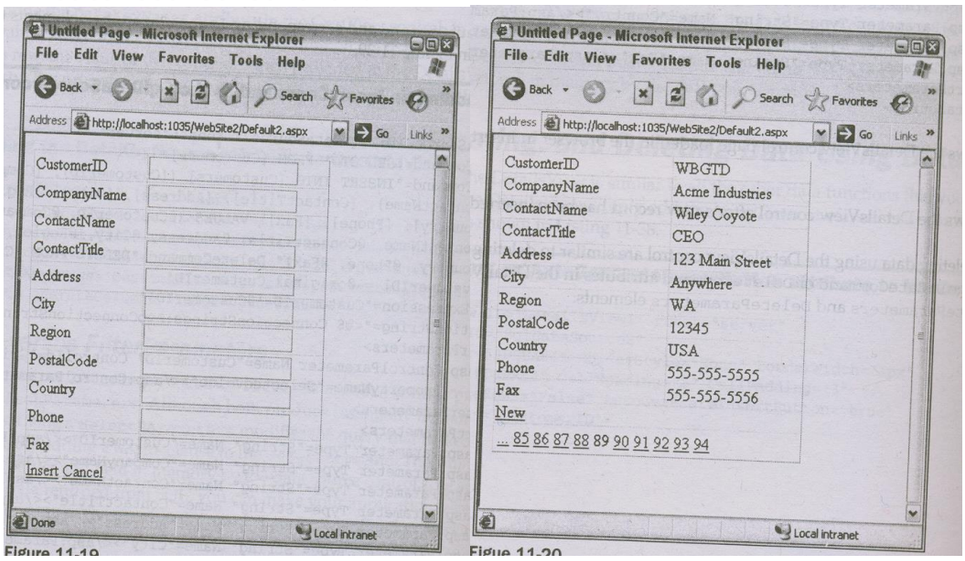
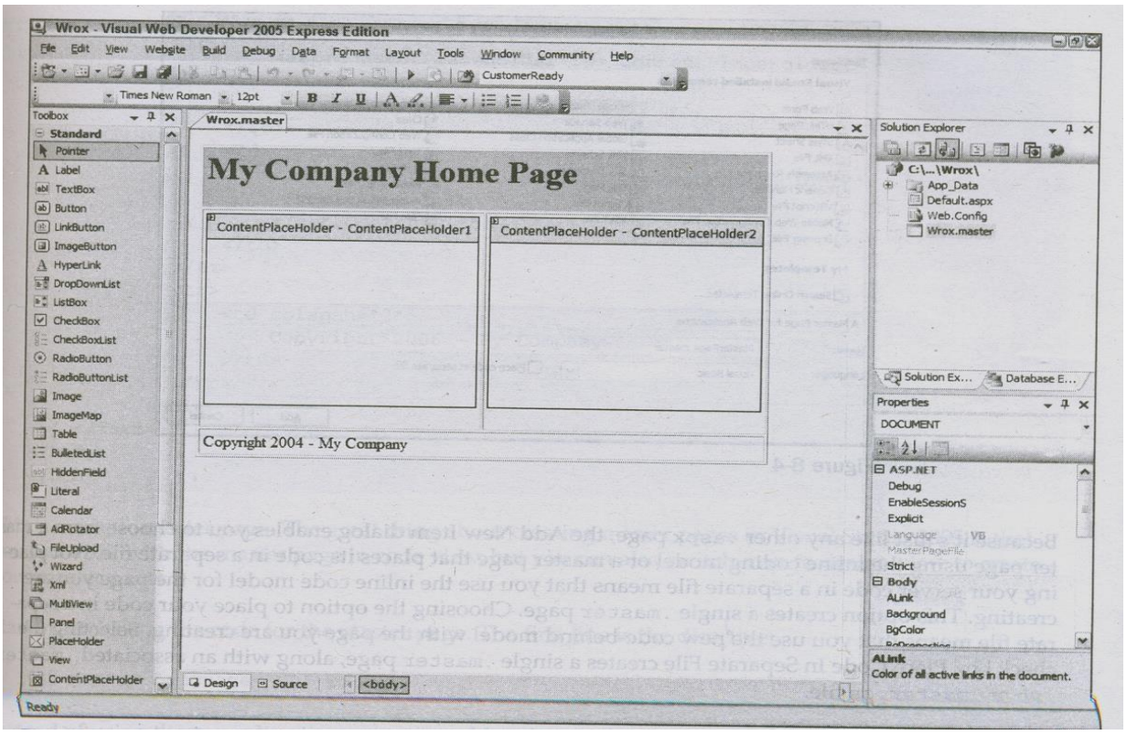


Figure 11-19 Figure 11-20

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



C#.NET:

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

MCS 308 : Seminar

MCS 401 DATA WAREHOUSING AND DATA MINING

UNIT I
Warehouse : What is it, who needs it and why?
Finding & Building the team
Managing the Data warehousing project
Data warehousing design methodologies

UNIT II
Data warehousing development methodologies
Data marts and star scheme design
The physical data warehouse
Fundamentals of ETL architecture

UNIT III
Loading the oracle warehouse
Oracle warehouse builder
Partitioning data
Indexing the warehouse

UNIT IV
OLAP
Data mining

Text Book:
1. Corey, Abbey et all : Oracle 8i Data warehousing TMH(2001)
Reference Book:
1. Strurm J : Data Warehousing with SQL Server & O Technical References PHI(2001)

2. Anahory S & Murray D : Data Warehousing in the Real Works Pearson Education Asia(2001)

3. Berry MJA & Linoff GS : Mastering Data Mining, Wiley(2001)

M.Sc Degree Examination
Fourth Semester
Computer science
Paper: MCS 401 Data Warehousing and Data Mining

Time: 3 Hrs Max Marks: 80

Answer ALL Questions. 8*2 = 16M
All Questions Carry equal marks.

1 Write short notes on
(a) Star Schema
(b) Snow flake Schema
(c) Transport tablespace
(d) Nonadditive Facts
(e) Materialized Views
(f) Dimension tables
(g) Partitions
(h) Summary Tables

2(a) Explain whether a Data Mart can replace a Data Warehouse.
(8M)
b) Discus the components of oracle 8 i for supporting data warehousing
(8M)

(or)

(c) Explain in details about Warehouse Design Architectures.
(8M)
(d) Write short notes on reasons for dirty data.
(8M)

3(a) Explain difference between Star Schema and Snowflake Schema with example
(8M)
3(b) Explain why do we need to build High Performance Query Structures
(8M)

(or)

3(c) Write short notes on Materialized Views with example
(8M)
(d) Explain about three dimension load strategies.
(8M)

4. a) Explain the features of SQL * loader
(8M)
b) Explain briefly OWB s/w architecture
(8M)

(or)

c) Discuss various approaches for selecting partition key based on which database objects can be partitioned
(8M)
d) Discus briefly about oracle 8 i indexing approaches
(8M)

5. a) Discus usage of OLAP tools like cognos power play for data analysis of reporting
(8M)

b) Discuss briefly OLAP architecture
(8M)

(or)

c) Explain benefits of data mining
(8)

d) Explain about DM techniques
(8)

MCS 402.1 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).

Model Paper

MCS 402.1: Embedded Systems

Time: 3 Hrs **Max. Marks: 80**

Answer the following questions. Each Question Carries 16 Marks.

1. (a) Define three main characteristics of Embedded Systems.
   (b) What is a design metric?
   (c) Describe why a general purpose processor could cost less than a single – purpose processor.
   (d) Compose 1K X 8 ROMS into 1K X 32 ROM.
   (e) Define Real-Time clock.
   (f) Explain the difference between port based I/O and bus-based I/O.
   (g) Define Real-Time systems and real time operating system.
   (h) Difference between FSM and FSMD.

Unit-I

2. a) Describe common Design metrics of an embedded system.
   b) Explain the importance of processor technology, IC technology and Design technology in designing a Embedded System.

(or)

   c) What are the steps involved in designing custom single – purpose processor.
   d) Explain RT-level custom single purpose processor design.

Unit-II

3. a) Describe steps involved in designing a general-purpose processor.
   b) Explain different software design tools that are used by embedded system designers.

(or)

   c) Explain pulse width modulators.
   d) Explain stepper Motor controllers.

Unit-III

4. a) Discuss different types of ROM's and RAM's.
   b) What is Cache ? Explain Cache mapping techniques.

(or)

   c) Describe different types of serial, parallel and wireless protocols.
   d) Discuss different arbitration methods.

Unit-IV

5. a) Illustrate the Design of a Digital Camera.

(or)

   b) Explain communication and synchronization among processes.
   c) Describe FSM with example.

MCS 402.2 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)

Model Paper

MCS 402.2 Software Testing Techniques

Time: 3 Hrs **Max. Marks: 80**

Answer ALL the following questions. Each Question carries Two Marks.

1.

(a) Software Test.
(b) Mission critical software.
(c) Test process definitions.
(d) Complex software products.
(e) Artistic Testing.
(f) Integration Test.
(g) Data Integrity Monitors.
(h) Virtualization.

Answer ONE question from each unit. Each Question carries sixteen Marks.

Unit - I

2.

(a) What makes Testers Special ? Why do we need Testers ? **8M**
(b) Distinguish between White Box Testing & Black Box Testing. **8M**

(or)

(c) Explain the importance of Debugging and product / function skills. **8M**
(d) What are the benefits of a strong Relationship. **8M**

Unit –II

3.

(a) Give the detail explanation of the importance of knowing what you test. **8M**
(b) Explain unit test focus areas. **8M**

(or)

(c) What are Function verification Test Focus Areas. **8M**
(d) Distinguish between Single – System and Multi system Testing. **8M**

Unit –III

4.

(a) Explain about Reuse Opportunities & Techniques. **8M**
(b) Explain about Injecting Testability into Development Plans. **8M**

(or)

(c) Explain about Protecting against Data Corruption. **8M**
(d) Explain about System verification Test Programs. **8M**

Unit – IV

5.

(a) Give detail explanation about Test Execution Sequence. **8M**

(b) Explain about Problem Diagnosis. **8M**

(or)

(c) Explain about Partitioning & Virtualization combination. **8M**

(d) Explain about Preproduction Testing. **8M**

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MCS403.1 ARTIFICIAL INTELLIGENCE

UNIT I

What is Artificial Intelligence,
AI Problems, ,AI Technique,Defining problem as a state space search, production systems, problem characterstics, production system characterstics.
Heuristic search techniques:
Generation and test - Hill climbing - Best-first search - problem reduction – constraint satisfaction - means–ends analysis.

UNIT II

Knowledge Representation :
Issues ,using predicate logic, resoulution,forward versus backward reasoning, matching, control knowledge.
Symbolic reasoning under uncertainity:
Introduction to nonmonotonic reasoning,augmenting a problem solver, implementation of depth first search and breadth first search.

UNIT III

Weak slot-and-filler structures:
semantic nets, frames.
strong slot-and-filler structures:
conceptual dependency, scripts.

UNIT IV

Natural Language Processing:
syntatic processing,augmented transition networks,semantic analysis, case grammars.
Common sense: Qualitative physics, commonsense ontologies, memory organization, case based reasoning.
Expert systems - representing using domain knowledge-expert system shell.

Prescribed Book:

Rich E & Knight k : Artificial Intelligence TMH(1991)

Reference Book:

Winston P.H : Artificial Intelligence, Addision Wesley (1993)
Russell & Norvig : Artificial Intelligence A moderen approach, Pearson education Asia
Donald A.waterman A guide to expert systems, pearson education India.

M.Sc Degree Examination
Fourth Semester
Computer science
Paper: MCS 403.1 Artificial Intelligence

Time: 3 Hrs Max Marks: 80

Answer ALL Question.
All Questions Carry equal marks.

1). Explain the following (8×2=16)

a) Define Artificial Intelligence?
b) What are various task domains of AI?
c) What is heuristic?
d) What is dependency directed backtracking?
e) What is semantic net?
f) What is abduction? Give an example?
g) Define truth maintenance system?
h) What is frame problem?

2) a) Explain the concept of problem reduction with an example? (8)

b) Trace the constraint satisfaction procedure solving the following

crypt arithmetic problem

BEST
MADE
MASTER (8)

(or)

c) Write about AO* algorithm (16)

3. a) Trace the operation of unification algorithm on each of the following

pairs of literals

i) f(Marcus) and (Caesar)
ii) f(x) and f(g(y))
iii) f(Marcus, g(x,y)) & f(x,g(carsar,Marcus))

(16)

(or)

b) Represent the following sentences using semantic nets (8)

"All students answered all questions in all possible ways"

c) Built-up the CD structure for the following sentences (8)

i) "While crossing sea , Hanuman saw a cannibal"
ii) "Americans bombed Hiroshima

4. a) Give the architecture of an expert system? (12)

b) What are expert system shells (4)

(or)

c) Discus briefly about frames (16)

5. a) What is a production system ? Explain it’s characteristics? (8)

b) Write a script to visit to a restaurant (8)

(or)

c) What is non-monotonic reasoning (4)

d) Explain a Justification Based Truth Maintenance System(JTMS) (12)

MCS 403.2: 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).

Model Paper

MCS 403.2 Mobile computing

Time : 3 Hrs **Max. Marks: 80**

Section – A

Answer ALL of the following questions. Each question carries two marks

1.

(a) Wireless PAN.
(b) How can we produce different tones?
(c) Define inter leaving.
(d) SMS vs. MMS.
(e) What is transport layer protocol that supports Internet Telephony?
(f) What are Ad Hoc networks?
(g) Write some of the applications of GPRS.
(h) Justify the need of providing security for mobile data.

Section – B

Unit – I

2.

(a) Write the architecture of mobile computing. **8M**
(b) Write the middle ware software and gateways needed in mobile computing. **8M**

(or)

(c) Develop a theatre booking application. **8M**
(d) Compare wireless networks with wired networks. **8M**

Unit –II

3.

(a) Explain the Bluetooth protocol stack. **8M**
(b) How can we perform value added services through SMS? **8M**

(or)

(c) Explain tunneling operations in mobile IP and also the relation ship between mobile IP and cellular IP. **16M**

Unit – III

4.

(a) Explain MMS environment. **8M**
(b) List out 3G applications. **8M**

(or)

(c) Explain WAE logical model. **8M**
(d) Explain the applications for GPRS. **8M**

Unit –IV

5.

(a) Compare between H.323 and SIP. **8M**

(b) Discuss the features of Wi – Fi. **8M**

(or)

(c) Discuss the various security models in mobile computing. **16M**

MCS 404 : 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)

MCS 405 : Project