M.Sc.(Computer Science)

SEMESTER SYSTEM FORM & COURSES

FIRST SEMESTER OF MSc(CS)

Sub Code	Name of the Subject	No. of Credits	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCS 101	Data Structures in C	5	30	70	100	4
MCS 102	Object Oriented Programming with JAVA	4	30	70	100	4
MCS 103	Computer Organization	5	30	70	100	4
MCS 104	Discrete Mathematical Structures	4	30	70	100	4
MCS 105	Software Engineering	5	30	70	100	4
MCS 106	Data Structures Lab using C	3	30	70	100	6
MCS 107	Java Programming Lab	3	30	70	100	6
MCS 108	Seminar	1	50	--	50	3
	TOTAL	30	260	490	750	35

SECOND SEMESTER OF MSc(CS)

Sub Code	Name of the Subject	No. of Credits	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCS 201	Web Technologies	4	30	70	100	4
MCS 202	Database Management Systems	5	30	70	100	4
MCS 203	Operating Systems	5	30	70	100	4
MCS 204	Computer Networks	4	30	70	100	4
MCS 205	Design & Analysis of Algorithms	5	30	70	100	4
MCS 206	Web Technologies Lab	3	30	70	100	6
MCS 207	DBMS Lab	3	30	70	100	6
MCS 208	Communication Skills	1	50	--	50	3
	TOTAL	30	260	490	750	35
	Non-Core	4	30	70	100	4

THIRD SEMESTER MSc(CS)

Sub Code	Name of the Subject	No. of Credits	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCS 301	Python Programming	5	30	70	100	4
MCS 302	.Net Programming	5	30	70	100	4
MCS 303	Object Oriented Modeling & Design using UML	5	30	70	100	4
MCS 304.1 /304.2	Distributed Systems /Microprocessors & Interfacing	4	30	70	100	4
MCS 305.1 /305.2	Cryptography & Network Security / Computer Graphics	4	30	70	100	4
MCS 306	Python Programming Lab	3	30	70	100	6
MCS 307	.Net Programming Lab	3	30	70	100	6
MCS 308	Seminar	1	50	--	50	3
	TOTAL	30	260	490	750	35
	Non-Core	4	30	70	100	4

FOURTH SEMESTER OF MSc(CS)

Sub Code	Name of the Subject	No. of Credits	Int. Marks	Ext. Marks	Total Marks	Hours/ Week
MCS 401	Data Mining And Big Data	5	30	70	100	4
MCS 402.1 /402.2	Embedded systems / Cloud Computing	5	30	70	100	4
MCS 403.1 / 403.2	Artificial Intelligence /Mobile Computing	4	30	70	100	4
MCS 404	Soft Skills	1	50	--	50	3
MCS 405	Project	10	20	80	100	20
	TOTAL	25	160	290	450	35

I SEMESTER

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:70**

Answer Question No.1 Compulsory: 7 x 2 = 14 M
Answer ONE Question from each unit: 4 x 14 = 56 M

1.
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

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

(OR)

3. a) Explain stacks with deletion and insertions algorithms
b) Develop an algorithm to delete an element from a Queue.

Unit-II

4. a) Explain the various representations of trees.
b) Explain binary search trees

(OR)

5. a) Explain Threaded binary trees.
b) Explain the tree traversals.

Unit-III

6. a) Illustrate Heap sort through an example.
b) write short notes on Insertion sort.

(OR)

7. a) What is Merge sort ?
b) Explain static hashing.

Unit-IV

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

(OR)

9. a) Explain Breadth first search and Depth first search.
b) Explain all pairs shortest path.

MCS 102: Object Oriented Programming with JAVA

UNIT I

Java Basics - History of Java, Java buzzwords, comments, data types, variables, constants, scope and life time of variables, operators, operator hierarchy, expressions, type conversion and casting, enumerated types, control flow-block scope, conditional statements, loops, break and continue statements, simple java program, arrays, input and output, formatting output, Review of OOP concepts, encapsulation, inheritance, polymorphism, classes, objects, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and constructors, recursion, garbage collection, building strings, exploring string class, Enumerations, autoboxing and unboxing, Generics.

Inheritance – Inheritance concept, benefits of inheritance, Super classes and Sub classes, Member access rules, Inheritance hierarchies, super uses, preventing inheritance: final classes and methods, casting, polymorphism- dynamic binding, method overriding, abstract classes and methods, the Object class and its methods.

UNIT II

interfaces – Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface.

Packages-Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages.

Files – streams- byte streams, character streams, text Input/output, binary input/output, random access file operations, File management using File class, Using java.io.

UNIT III

Exception handling – Dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception sub classes, Guide lines for proper use of exceptions.

Multithreading - Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, interthread communication, thread groups, daemon threads.

UNIT IV :

Event Handling - Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Semantic and Low-level events, Examples: handling a button click, handling mouse and keyboard events, Adapter classes.

Applets – Inheritance hierarchy for applets, differences between applets and applications, life cycle of an applet - Four methods of an applet, Developing applets and testing, passing parameters to applets, applet security issues.

GUI Programming with Java - The AWT class hierarchy, Introduction to Swing, Swing vs. AWT,MVC architecture, Hierarchy for Swing components, Containers – Top-level containers – JFrame, JApplet, JWindow, JDialog, Light weight containers – JPanel, A simple swing application, Overview of several swing components- Jbutton, JToggleButton, JCheckBox, JRadioButton, JLabel, JTextField, JTextArea, JList, JComboBox, JMenu, Java's Graphics capabilities – Introduction, Graphics contexts and Graphics objects, color control, Font control, Drawing lines, rectangles and ovals, Drawing arcs, Layout management - Layout manager types – border, grid, flow, box.

Prescribed Text Books:

1. Java: the complete reference, 7th editon, Herbert Schildt, TMH.
2. Java for Programmers, P.J.Deitel and H.M.Deitel, Pearson education / Java: How to Program P.J.Deitel and H.M.Deitel ,8th edition, PHI.

Reference Text Books:

1. Core Java, Volume 1-Fundamentals, eighth edition, Cay S.Horstmann and Gary Cornell, Pearson education.
2. Thinking in Java, Bruce Eckel, PHP
3. Object Oriented Programming through Java, P.Radha Krishna, Universities Press.

MODEL PAPER

MCS 102 : Object Oriented programming with JAVA

Time : 3 hrs **Max Marks : 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

1. a) Inheritance vs polymorphism
   b) Define abstract class.
   c) Explain bytesteam
   d) explain java.io package
   e) Differences between multiple processes and multiple threads
   f) life cycle of an applet
   g) explain layout manager

UNIT – I

2. a) Explain about final classes, final methods and final variables?
   b) Explain about the abstract class with example program

OR

3. What are the basic principles of Object Oriented Programming? Explain with examples, how they are implemented in C++

UNIT – II

4. Is there any alternative solution for Inheritance. If so explain the advantages and disadvantages of it.

OR

5. (a) What is a package? How do we design a package?
   (b) How do we add a class or interface to a package?

UNIT – III

6. In JAVA, is exception handling implicit or explicit or both. Explain with the help of example java programs.

OR

7. (a) With the help of an example, explain multithreading by extending thread class.
   (b) Implementing Runnable interface and extending thread, which method you prefer for multithreading and why

UNIT – IV

8. Differentiate following with suitable examples:
   (a) Frame, JFrame (b) Applet, JApplet (c) Menu, Jmenu

OR

9. Explain the following:
   (a) Creating an applet (b) Passing parameters to applets
   (c) Adding graphics and colors to applets

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

MCS-103: COMPUTER ORGANIZATION

Time:3Hrs **Max. Marks: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

1. (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

2. 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 $F(A,B,C,D)=\sum(0,2,5,8,9,10,11,14,15)$

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

(OR)

3. a) Explain the Working of JK FlipFlop with necessary circuit diagram.
   b) i) Write short notes on fixed point Integer representation.

   ii) Draw the logic diagram of 4-bit synchorous binary counter.

Unit-II

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

(OR)

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

Unit-III

6. a) Draw and Explain the block diagram of a typical Microprogram sequences for a control memory.
   b) i) Explain any four Address modes.

ii) Give the difference between Hardwire control and microprgm control.

(OR)

7. a) Explain Booth Multiplication Algorithm.
   b) i) Give the Block diagram of BCD Adder.
      ii) write about different types of Interrupts.

Unit-IV

8. a) Explain DMA Data transfer.
   b) write about Virtual Memory.

(OR)

9. a) Discuss about various types of cache memory mapping procedures.

   b) Explain Daisy chain priority Interrupt.

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

MCS-104: DISCRETE MATHEMATICAL STRUCTURES

Time:3Hrs **Max. Marks:70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**

Answer ONE Question from each unit: **4 x 14 = 56 M**

1.

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

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

(c).Defien abelion group and homomarphism.

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

(e).State four colour problem.

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

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

(h).What is a choromatic number

Unit - I

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

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

(0R)

3.(a).Show that $7(P \wedge Q)$ fallows from $7P \wedge 7Q$.

(b).Prove that $(A \wedge B) \times (C \wedge D) = (A \times C) \wedge (B \times D)$.

Unit-II

4. (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]

(b).State and prove Legranges theorem.

(OR)

5. (a).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.

(b).Define adjacency matrix and path matrix of a graph G .
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 -III

6. (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

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

(OR)

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

(b).show that the set of all the invertible elements of a monoid from a

group under the same operation as that of the monoid.

Unit-IV

8. (a).Show that the following equivalance :

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

(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.

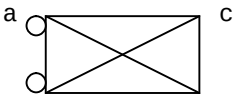
(OR)

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

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

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

(ii).Transitive closure.



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).

Computer Science
MCS105 - SOFTWARE ENGINEERING

Time: 3 Hours | Max. Marks: 70

Answer Question No.1 Compulsory: 7 x 2 = 14 M
Answer ONE Question from each unit: 4 x 14 = 56 M

1. Write Short note on
   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

   (b) What are software myths explain

(Or)

3. (a)What is an RAD model explain
   (b) What is the role of the project and process in management spectrum.

UNIT-II

4. (a) Explain the elicitation requirement
   (b) Explain the flow oriented modeling

(Or)

5. (a) Explain the creation of behavioral modeling
   (b) Explain the design concepts

UNIT-III

6. (a) Explain the architectural styles.
   (b) Discuss the golden rules of interface design.

(OR)

7. (a) Explain the transform, transaction mappings
   (b) What are the design steps involved in user interface.

UNIT-IV

8. Discuss the following
   (i)White box testing.
   (ii) Black box testing.

(OR)

9. Write a short notes on Test strategies for conventional software.

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. Write a Java Program to define a class, describe its constructor, overload the constructors and instantiate its object.

2. Write a Java Program to define a class, define instance methods for setting and retrieving values of instance variables and instantiate its object

3. Write a java program to practice using String class and its methods

4. Write a java program to implement inheritance and demonstrate use of method overriding

5. Write a java program to implement multilevel inheritance by applying various access controls to its data members and methods.

6. Write a program to demonstrate use of implementing interfaces

7. Design a Java interface for ADT Stack. Develop two different classes that implement this interface, one using array and the other using linked-list. Provide necessary exception handling in both the implementations.

8. Write a Java program to implement the concept of importing classes from user defined package and creating packages

9. Write a program to implement the concept of threading by implementing Runnable Interface

10. write a java program to store and read objects from a file

11. Write a Java program that displays the number of characters, lines and words in a text file.

12. write a java program to illustrate object serialization

13. Create a java program to illustrate user defined exception

14. Write a java program to create a thread using runnable interface

15. Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds

16. Write an applet To create multiple threads that correctly implements producer consumer problem using the concept of Inter thread communication

17. Write an applet To handling the mouse events

18. Write a Program That works as a simple calculator using Grid layout to arrange buttons for the digits and +,-,* % operations. Add a text field to print the result.

19. Build and run "CelsiusConverter" sample application using swings

20. Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked

MCS 108 : Seminar

II SEMESTER

MCS 201: WEB TECHNOLOGIES

UNIT I

HTML: Common Tags: List, Tables, images, forms, Frames, Cascading Style Sheets;
Java Script: Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

UNIT II

XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX
CGI Scripting: What is CGI? – Developing CGI applications – Processing CGI – Returning a Basic HTML page – Introduction to CGI.pm – CGI.pm methods – Creating HTML pages dynamically.

UNIT III

JDBC: Introduction to JDBC – Connections – Internal Database Connections – Statements – Results Sets - Prepared Statements - Callable Statements.

Network Programming and RMI: why networked Java – Basic Network Concepts – looking up Internet Addresses – URLs and URIs – UDP Datagrams and Sockets – Remote Method Invocation.

Unit –IV

Web Servers and Servlets: Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servlet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues.

Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat

Prescribed Textbooks

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (units I, II)
2. Java Programming with JDBC ;Donald Bales, O'Reilly (Unit III)
3. Java Network Programming, elliotte Rusty Harold, 3rd Edition, O'Reilly (Unit III)
4. Java Server Pages – Hans Bergsten, SPD O'Reilly (Unit IV)

Reference Textbooks

1. Robert W. Sebesta, "Programming the World Wide Web", Third Edition, Pearson Education (2007).
2. Anders Moller and Michael schwartzbach, "An Introduction to XML and Web Technologies", Addison Wesley (2006)
3. Jeffrey C. Jackson, "Web Technologies – A Computer Science Perspective", Pearson Education (2008).
4. H.M.Deitel, P.J.Deitel, "Java How to Program", Sixth Edition, Pearson Education (2007).

Model Paper

MCS 201: WEB TECHNOLOGIES

Time: 3 Hrs **Max. Marks: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

1. (a) What are HTML tags?
   (b) What are the features of JavaScript?
   (c) What is XML? How is it different from HTML?
   (d) What is DTD?
   (e) What is meant by Session?
   (f) List the JSP implicit objects?
   (g) Define Servlet

UNIT – I

2. (a) Create a simple HTML page which demonstrates the use of the various types of lists. Try adding a definition list which uses an unordered list to define terms.
   (b) Develop a javascript to determine whether a given number is an 'ARMSTRONG NUMBER' or not.

OR

3. (a) How how group and alignment of tables rows and columns is achieved using HTML.
   (b) Describe the various Date Objects with suitable examples.

UNIT – II

4. (a) Explain the five possible keywords in a DTD declaration with suitable examples.
   (b) Define an XML schema. Show how an XML schema can be created.

OR

5. (a) explain CGI.pm module
   (b) explain clearly the steps involved in executing a CGI program

UNIT – III

6. (a) Discuss the four types of JDBC drivers.
   (b) Give a note on javax.sql package.

OR

7. What is the RMI layer model. What are the steps involved in writing an RMI Application?

UNIT – I V

8. (a) What are the limitations of Servlets? How JSP over comes these Problems.
   (b) Discuss about Tomcat Server.

OR

9. Explain the components of JSP and how application data can be shared in JSP? Explain

* * * * *

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

MCS-202 : DATABASE MANAGEMENT SYSTEMS

Time:3hrs **Max.Marks:70M**

Answer Question No.1 Compulsory: 7 x 2 = 14 M
Answer ONE Question from each unit: 4 x 14 = 56 M

1. Write Short notes on
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.
(b) Explain Generalization & Specialization.

(OR)

3. Explain Fundamental operations with syntax & examples.

UNIT - II

4. Explain the Basic structure of SQL queries.

(OR)

5. (a) What are Modifications to the database.
(b) Explain Views.

UNIT - III

6. (a) What is multiple key access
(b) Explain file organization

(OR)

7. (a)Explain Raid levels.
(b) What are B+ tree index files explain with an example for insertion.

UNIT - IV

8. (a) What is 4^{th} Normal form explain with an example.
(b) Explain multiple Granularity.

(OR)

9. (a) What is BCNF explain with an example.
(b) Explain what is a deadlock and how to handle them.

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: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

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)

3.a) Discuss different types of Operating System Structures
b) Explain Process Scheduling

UNIT – II

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

(or)

5. Compare different types of Process Scheduling Algorithms.

UNIT – III

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

(or)

7.**a**) Explain segmentation.
b) Write about LRU page replacement and Optimal page replacement.

UNIT - IV

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

(or)

9.**a**) Explain different RAID levels.
b) 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 : 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

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.
b) Describe Go Back N protocol.

(or)

3. a) Explain the architecture of the Internet
b) Write about design issues of a Data Link layer.

UNIT – II

4. a) Explain Spanning tree Bridges.
b) Give and explain 802.11 frame structure, services

(or)

5. a) Describe architecture, applications, protocol stack of Bluetooth
b) Explain Switched Ethernet

UNIT – III

6. a) Explain IP Header Format and IP addresses
b) Discuss about Tunneling and Fragmentation

(or)

7. a) Explain Distance Vector Routing Algorithm
b) write about TCP Congestion Control

UNIT – IV

8. a) Explain about DNS
b) Write about URL’s

(or)

9. a) Explain Electronic Mail concept
b)Discuss JPEG Compression mechanism

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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. Develop and demonstrate a HTML document that illustrates the use external style sheet, ordered list, table, borders, padding, color, and the tag.

2. Write HTML code to provide intra document linking.

3. Create a form with the following specifications:

   a) Our form uses frames, one to hold the links bar at the top 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. to create a webpage with the following using html

   a. to embed an image in web page

   b. to fix the hot spots

   c. show all the related information when a hot spot is clicked in the map

5. Develop a HTML Form, which accepts any Mathematical expression. Write JavaScript code to Evaluates the expression and Displays the result.

6. Create a HTML form that has number of Textboxes. When the form runs in the Browser fill the textboxes with data. Write JavaScript code that verifies that all textboxes has been filled. If a textboxes has been left empty, popup an alert indicating which textbox has been left empty.

7. Write a JavaScript code to find the sum of N natural Numbers. (Use user-defined function)

8. Write a JavaScript code to find factorial of N. (Use recursive function)

9. Write a JavaScript code block using arrays and generate the current date in words, this should include the day, month and year.

10. Create a web page using two image files, which switch between one another as the mouse pointer moves over the images. Use the onMouseOver and onMouseOut event handlers.

11. Design an XML document to store information about a student in an engineering college affiliated to ANU. The information must include college id, Name of the College, Brach, Year of

Joining, and e-mail id. Make up sample data for 3 students. Create a CSS style sheet and use it to display the document.

12. Create an XML document, which contains 10 users information. Implement a program, which takes User Id as an input and returns the user details by taking the user information from the XML document

13. write a program for implementing student information using XML

14. write a java program to illustrate java to database connectivity using JDBC

15. Write a program to print the Fibonacci numbers using RMI.

16. Write a program using RMI to access the database using the primary key value and return the data to the client.

17. Write a html program for invoking servlet from applet

18. write a java servlet program to conduct online examination and to display student mark list available in a database

19. Create a java program to create an airline reservation service and a travel agent and the travel agent is searching for an airline using web services and database.

20. Write a JSP program to calculate income tax, login and data capture.

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)

10. **Get Suppliers Names for Suppliers who supply at least one red part.**
11. **Get Suppliers Names for Suppliers who do not supply part 'P2'**
12. **Using Group by with Having Clause, Get the part numbers for all the parts supplied by more than one supplier.**
13. **Get supplier numbers for suppliers with status value less the current max status value.**
14. **Get the total quantity of the part 'P2' supplied.**
15. **Get the part color, supplied by the supplier 'S1'**
16. **Get the names of the parts supplied by the supplier 'Smith' and "Black"**
17. **Get the Project numbers, whose parts are not in Red Color, from London.**
18. **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.**
33. **Find the sno's of suppliers who charge more for some part than the average cost of that part.**
34. **Find the sid's of suppliers who supply only red parts.**
35. **Find the sid's of suppliers who supply a red and a green part.**
36. **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)

III SEMESTER

MCS301- PYTHON PROGRAMMING

UNIT I

Introduction: The Process of Computational Problem Solving, Python Programming Language, Python Data Types: Expressions, Variables and Assignments, Strings, List, Objects and Classes, Python Standard Library, Imperative Programming: Python programs, Execution Control Structures, User-Defined Functions, Python Variables and Assignments, Parameter Passing. -

UNIT II

Text Files: Strings, Formatted Output, Files, Errors and Exception Handling, Execution and Control Structures: if Statement, for Loop, Two Dimensional Lists, while Loop, More Loop Patterns, Additional Iteration Control Statements, Containers and Randomness: Dictionaries, Other Built-in Container Types, Character Encoding and Strings, Module random, Set Data Type.

UNIT III

Object Oriented Programming: Fundamental Concepts, Defining a New Python Class, User-Defined Classes, Designing New Container Classes, Overloaded Operators, Inheritance, User-Defined Exceptions, Namespaces: Encapsulation in Functions, Global versus Local Namespaces, Exception Control Flow, Modules and Namespaces. **Objects and Their Use:** Software Objects, Turtle Graphics, Modular Design: Modules, Top-Down Design, Python Modules, Recursion: Introduction to Recursion, Examples of Recursion, Run Time Analysis, Searching, Iteration Vs Recursion, Recursive Problem Solving, Functional Language Approach.

UNIT IV

Numerical Computing in Python: NumPy, Vectorized Algorithms, Graphical User Interfaces: Basics of tkinter GUI Development, Event-Based tkinter Widgets, Designing GUIs, OOP for GUI, The Web and Search: The World Wide Web, Python WWW API, String Pattern Matching, Database Programming in Python

TEXT BOOK

Ljubomir Perkovic, “Introduction to Computing Using Python: An Application Development Focus”, Wiley, 2012.

REFERENCES

Charles Dierbach, “Introduction to Computer Science Using Python: A Computational Problem-Solving Focus”, Wiley, 2013.

Model Paper

MCS-301: PYTHON PROGRAMMING

Time:3Hrs **Max. Marks:70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

1. a. How to declare and assign variables in python
   b. What is List
   c. Define container
   d. explain top-down design
   e. define recursion
   f. what is NumPy
   g. what is GUI

UNIT I

2 (a) Write Python statements corresponding to the following:

(i) Assign to variable flowers a list containing strings 'rose', 'bougainvillea', 'yucca', 'marigold', 'daylilly', and 'lilly of the valley'.
(ii) Write a Boolean expression that evaluates to True if string 'potato' is in list flowers, and evaluate the expression.
(iii) Assign to list thorny the sublist of list flowers consisting of the first three objects in the list.
(iv) Assign to list poisonous the sublist of list flowers consisting of just the last object of list flowers.

(b) Write a python program to implement string reverse function

OR

3 (a) Explain execution control structures
(b) How to achieve parameter passing in Python.

UNIT II

4. (a) Explain built in Exception in python with examples
   (b) Write short notes on Dictionaries

OR

5. Explain String functions

UNIT III

6. (a) differentiate Global and local namespaces
   (b) explain Multiple exception handlers

OR

7. Explain class, object and instance variables.

UNIT IV

8. Explain the concept designing GUIs

OR

9. Explain Python WWW API

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: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

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)

3.a) Explain the following controls
i. Menus
ii. Timer
iii. PictureBox
iv. Tree view
b)Explain mouse events and key board events.

Unit-II

4. a) Explain all the validation controls.
b) Write the procedure to design the application which allows the valid user to enter into it.

(or)

5. a)Briefly explain about master pager and themes
b) With suitable example explain the navigation controls.

Unit-III

6.a) What are the concepts of object oriented programming.
b) Explain the following controls
i. ComboBox
ii. ListBox
iii. Panel
iv. Builtin dialogBox

(or)

7.a) Explain the steps involved in windows form design and interface
b) Write the procedure for coffee shop billing application (use checkbox)

Unit-IV

8.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)

9. 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).
2. Hans-Erik Eriksson, “UMLZ Took Kit”, Wiley (2008).
3. Pascal Roques, “Modeling Software Systems Using UML2”, Wiley (2008).
4. Simon Benett, Steve Mc Robb, “Object Oriented Systems Analysis and Design using UML”, Second Edition, TMH (2007).
5. Mark Priestley, “Practical Object Oriented Design with UML”, Second Edition, TMH (2008).
6. 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: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

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)

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

Unit-II

4.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)

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

Unit-III

6. Discuss about the steps involved in Analysis of a System.

(or)

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

Unit-IV

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

(or)

9.a) Discuss the programming style in the large complex systems.
b) Discuss about good programming style.

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MCS 304.1 : Distributed Systems

UNIT – 1:

Characterization of Distributed systems: Introduction, Examples of Distributed systems, Resource Sharing and the Web, Challenges.
System Models: Introduction, Architectural Models – software Layers, System Architecture, Variations, Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models – Interaction Model, Failure Model, Security Model.

UNIT – 2:

Inter process Communication: Introduction, The API for the Internet Protocols – The characteristics of Inter process communication, sockets, UDP diagram communication. TCP stream communication; External data representation and marshalling; client server communication; group communication – IP multicast – an implementation of group communication, reliability and ordering of multicast.

UNIT – 3:

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects – Object Model, Distributed Objects Modal, Design Issues for **RMI**, Implementation of **RMI**, Distributed Garbage Collection; Remote Procedure Calls, Events and Notifications, Case study: **JAVA RMI**
Operating Systems Support: Introduction, The Operating System Layer, Protection, Processes and Threads – Address Space, Creation of a New Process, Threads.

UNIT – 4:

Distributed File Systems: Introduction, File service Architecture; Peer – to – peer systems; Introduction, Napster and its Legacy, peer – to – peer Middleware, Routing Overlays.
Coordination and Agreements: Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication.
Transactions & Replications: Introduction, System Model and Group Communication, Concurrency Control in Distributed Transactions, Distributed Dead Locks, Transaction Recovery; Replication-Introduction, passive (Primary) Replication, Active Replication.

TEXT BOOKS:

1. Ajay D Kshemkalyani, Mukesh Sighal, “Distributed Computing, Principles, Algorithms and Systems”, Cambridge.
2. George Coulouris, Jean Dollimore, Tim Kindberg, “Distributed Systems – Concepts and Design”, Fourth Edition, Pearson Publication.

Model Paper

MCS 304.1 : Distributed Systems

Time: 3Hrs. **Max. Marks: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

1. **a)** what is distributed systems?
   b) what is a socket?
   c) Importance of RPC.
   d) Difference between object model and distributed object model.
   e) Advantages of peer-to-peer systems.
   f) How to create a new process?
   g) What is distributed deadlock?
   h) What is Overlay routing?

UNIT –I

2. State and explain the challenges of distributed systems.

(or)

3. Explain about Architectural models.

UNIT – II

4. **a)** Describe the approaches for external data representation and marshalling.
   b) Discuss the issues relating to datagram communication.

(or)

5. **a)** Write in detail about the characteristics of Inter process communication.
   b) Differentiate between TCP stream communication and client server communication.

UNIT – III

6. Briefly explain about the design issues and Implementation of RMI

(Or)

7. What is meant by Object model? Describe how distributed object are related to distributed system.

UNIT – IV

8. Explain process and threads.

(Or)

9. What do you mean by nested transaction ? Explain the usage of locks in nested transaction.

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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: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

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)

3.a) With suitable example explain data transfer and logical group instructions of 8086.
b) Explain different assembler directives of 8086 assembler.

UNIT - II

4.a) Explain the concept of stack.
b) How 8086 macro's are declared and used in the program.

(or)

5. Describe interrupt I/O.

UNIT – III

6.a) Draw and explain timing diagram for input operation in 8086 minimum mode.
b) Explain operation of 8086 in its maximum mode.

(or)

7.Draw and explain functions of 8255A programmable peripheral interface.

UNIT - IV

8. Described Architectural details of Pentium processor.

(or)

9. 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)

Model Paper

Paper: MCS 305.1: CRYPTOGRAPHY AND NETWORKING SECURITY

Time: 3 Hours Max. Marks: 70

Answer Question No.1 Compulsory: 7 x 2 = 14 M

Answer ONE Question from each unit: 4 x 14 = 56 M

1. (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.
   (b) Briefly explain about DES encryption algorithm.

(Or)

3. (a) Define OSI security Architecture
   (b) Discuss about random number generation techniques in cryptography.

UNIT – II

4.(a) Explain RSA algorithm
  (b) Perform encryption and decryption using RSA algorithm for the following p=3, q=11, d=7, M=5

(Or)

5.(a) Discuss Diffie hellman key exchange algorithm
  (b) Differentiate between Link level and End to end encryption

UNIT – III

6. (a) Explain in detail about authentication requirements.

   (b)Define Message authentication codes and its requirements

(Or)

7. (a) Explain about Digital signature standard (DSS).

   (b) List out the uses of hash functions.

UNIT – IV

8. (a) Write short notes on Firewalls and list various types of firewalls
   (b) Explain the usage of Pretty good privacy

(or)

9. Explain IP Security in detail

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

Model Question Paper

MCS 305.2: Computer Graphics

Time: 3Hrs **Max. Marks: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**

Answer ONE Question from each unit: **4 x 14 = 56 M**

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.

UNIT-I

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

(OR)

3. a)Explain polygon-filling methods. 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.

UNIT-II

4. a) Describe the two dimensional transformations of translators, rotation and scaling.
   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)

OR

5. a) Describe sutherland-Hodgerman algorithm for polygon clipping.
   b) Explain the terms : Windowing and clipping.

UNIT-III

6. a)Explain various interactive picture construction techniques.

   b)Explain various logical classifications of I/P devices.

OR

7. a) What are the various types of projections? Explain.

   b) What are homogenous coordinates? How are they useful in transformations?

UNIT-IV

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

OR

9. a) Explain Hidden surface removal.
   b) Describe scanline method for hidden surface removal.

MCS 306 : Python Programming Lab

Lab Cycle

Simple Programs

1. Write a program using print Pascal triangle.
2. Write a program to find out the roots of the quadratic equations.
3. Write a program to display the Fibonacci series using generators.
4. Write a program to check the given number is palindrome or not.
5. Write a program to find the sum of digits of a given number
6. Write a Python program to calculate X= $\frac{1}{2!}+\frac{2}{4!}+\frac{4}{8!}+\frac{8}{16!}$
7. Write a Python program to remove the punctuations from a string.
8. Write a Python program to implement the simple calculator.
9. Write a Python program to print the lower and upper triangles of a matrix.
10. Write a Python program to merge two mails.

Functions

1. Write a recursive Python function that has a parameter representing a list of integers and returns the maximum stored in the list.
2. Write a recursive Python function to that generates the top 20 even prime numbers in the range 1 to 1000.
3. Write a python function to calculate the multiplication of two matrices.
4. Write a Python function to reverse the given string.
5. Write a Python function that takes an integer n and a character c, returns a string and displays as “xxxxx” (Ex: the length of the retuned string is 5, then the output as XXXXX)
6. Write Python function that the search the given number in the list of numbers by using binary search.
7. Write a Python function to convert the given decimal number into binary number by using recursion.
8. Write a Python function to sort the list of records in a file.

GUI Programs

1. Construct a GUI application to generate the employee pay slip
2. Construct a GUI application to generate a Bar Graph for a excel data
3. Construct a GUI application to perform the Arithmetic operations
   - Read Input Values through input window
   - Choose choice and Operation through following windows

Choice
1. Integer Arithmetic
2. Real Arithmetic

Operations
1. Addition
2. Subtraction
3. Multiplication
4. Division

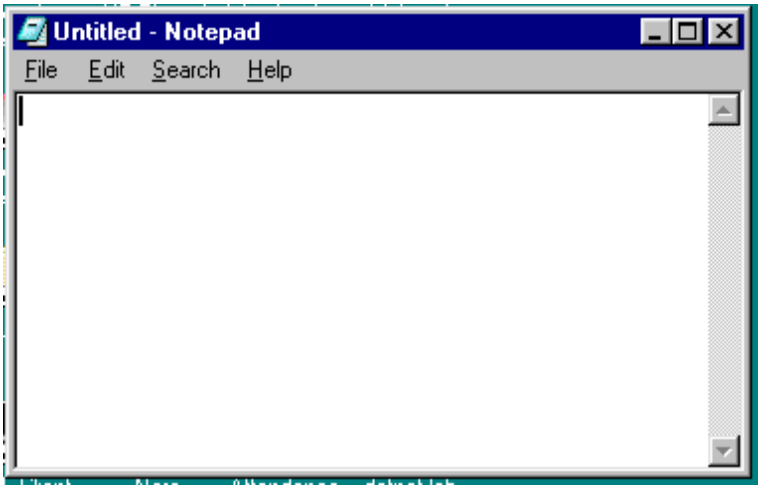
   - Display the result in Message Box.

MCS 307 : . Net Programming Lab

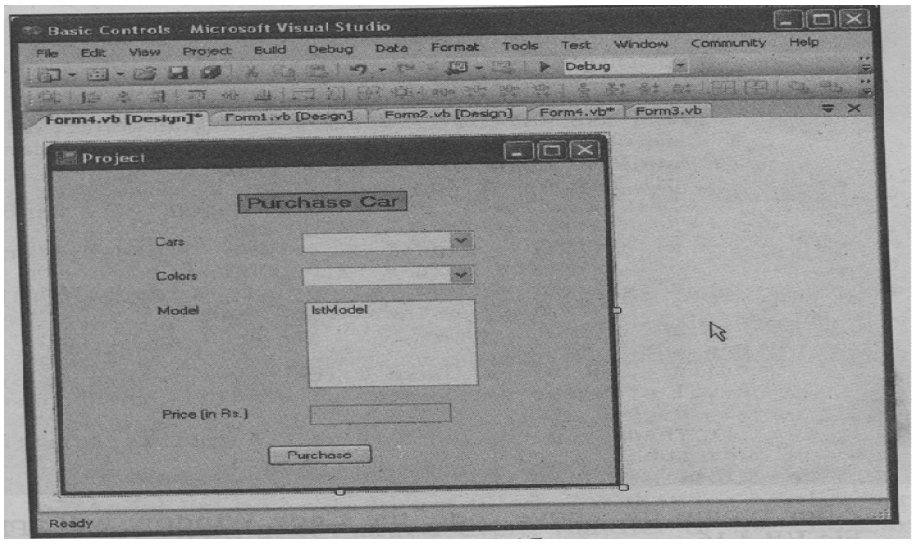
Lab Cycle

VB .NET:

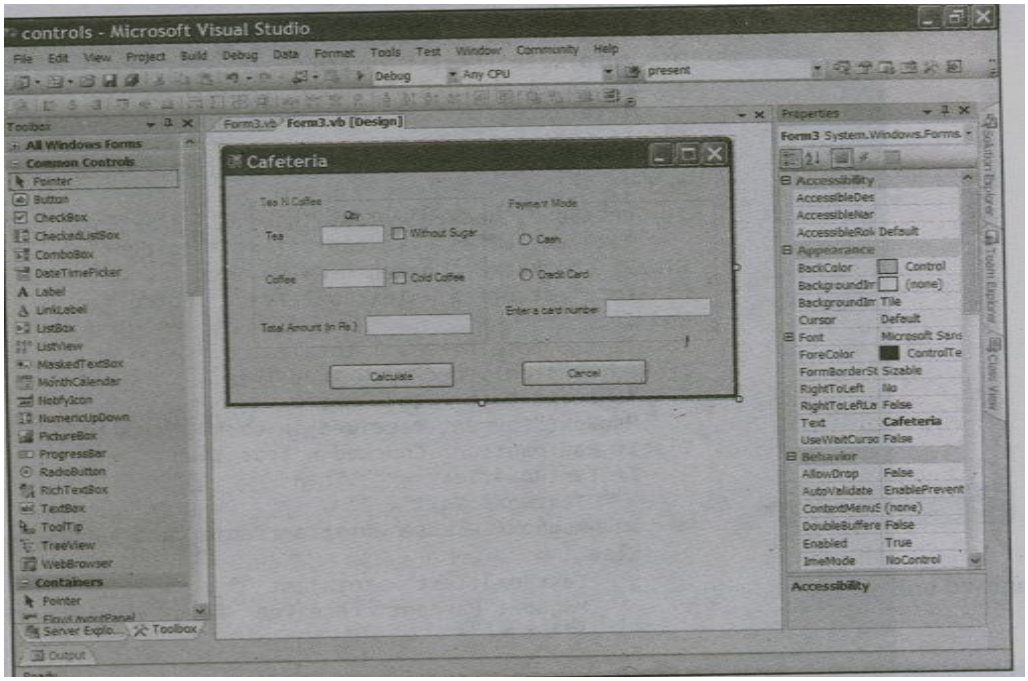
1) Develop an application which is similar to “Notepad” using menus.



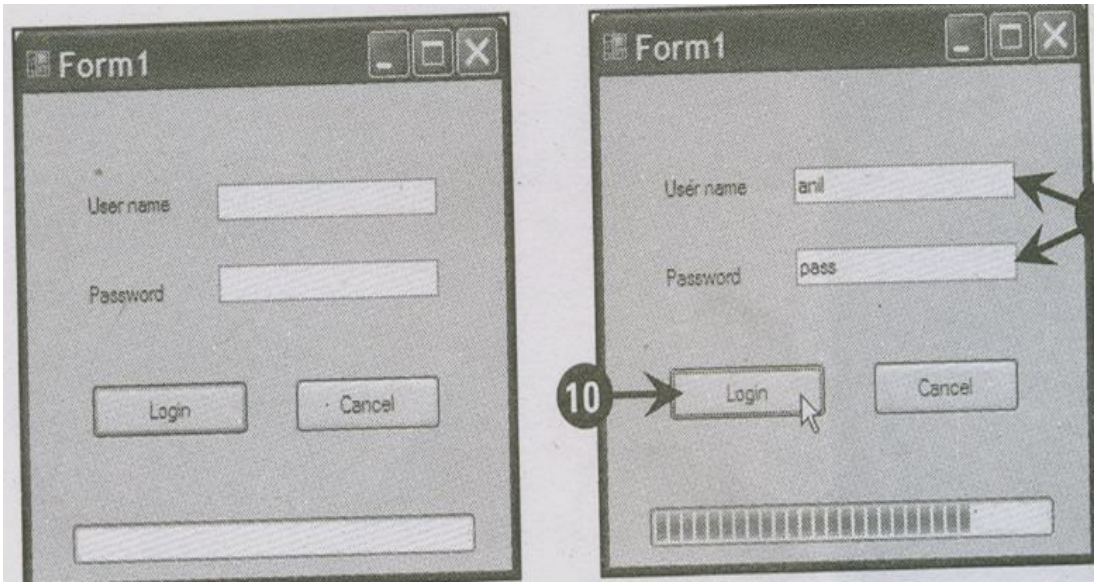
2) (a) Develop an application for facilitating purchasing order which will look like as shown below :



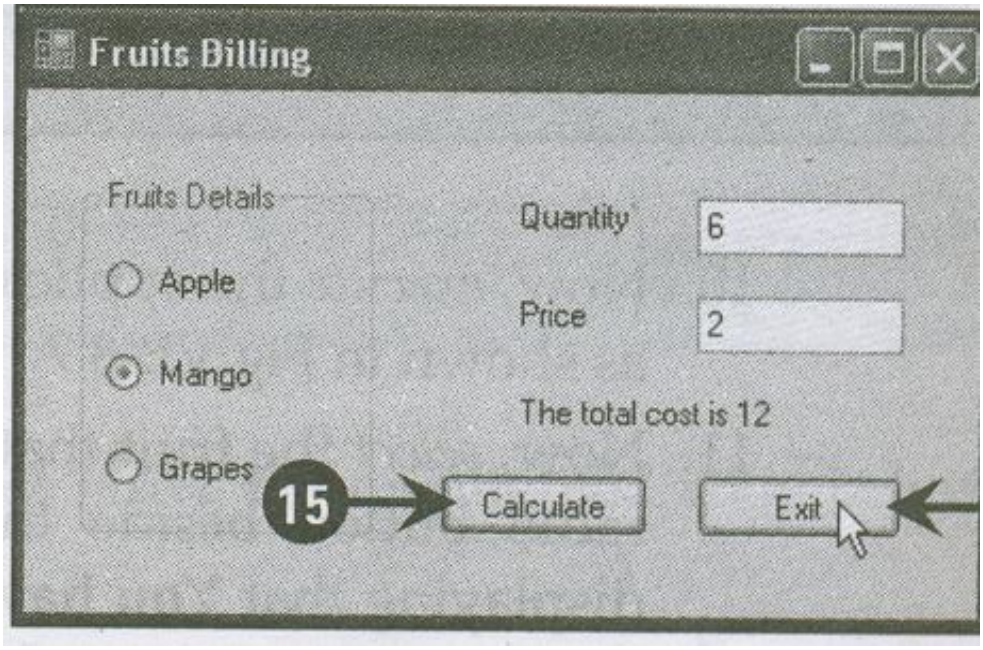
(b) Develop an application for billing system in coffee shops which will look like as shown below :



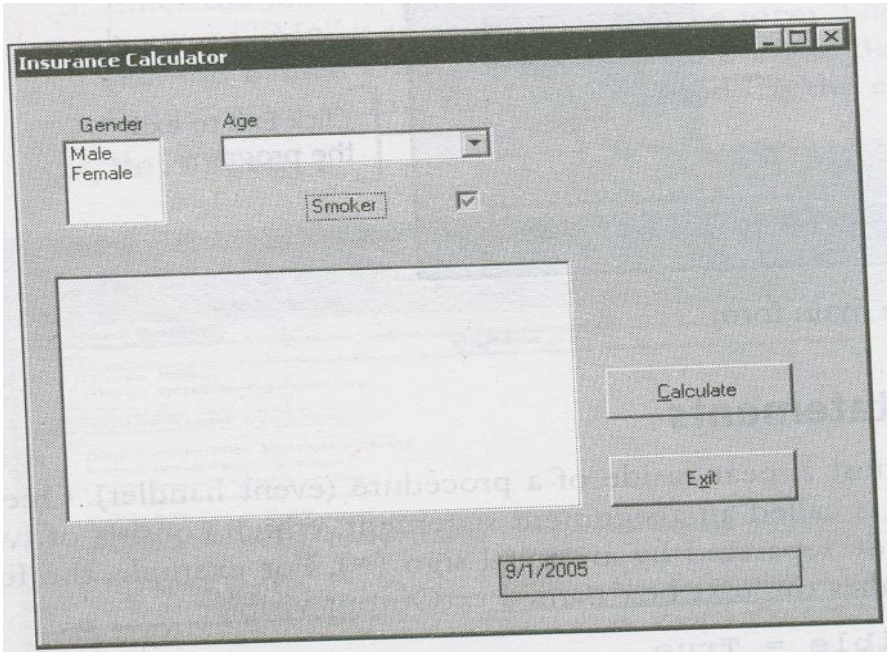
3) (a)Develop an application which is similar to login form including the progress bar controls.



(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

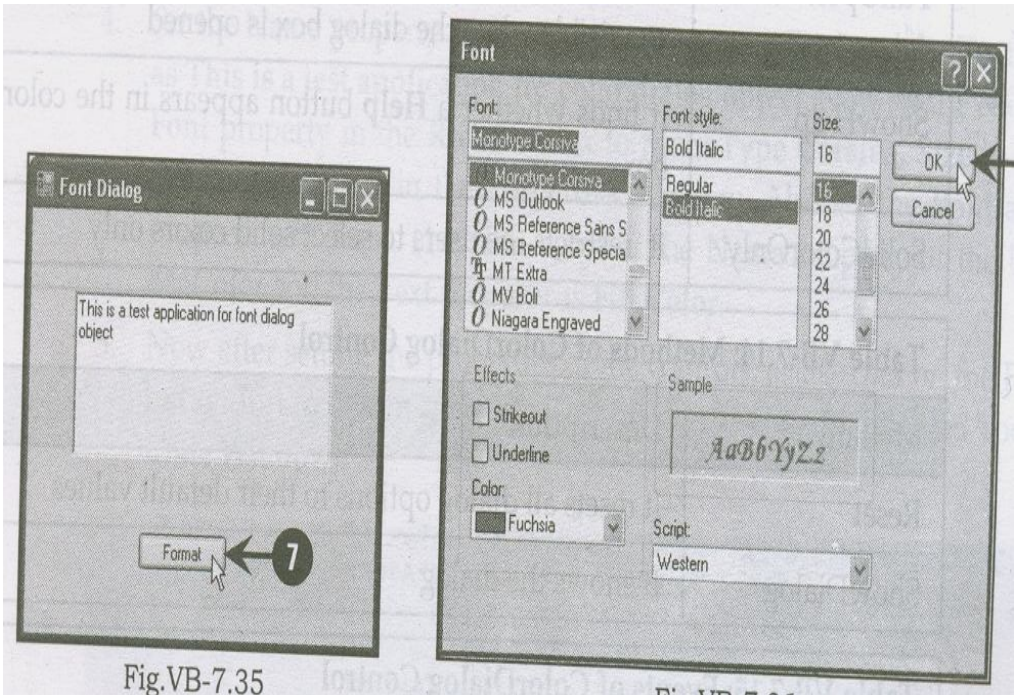


Fig.VB-7.35

(b) Develop an application using color dialog control

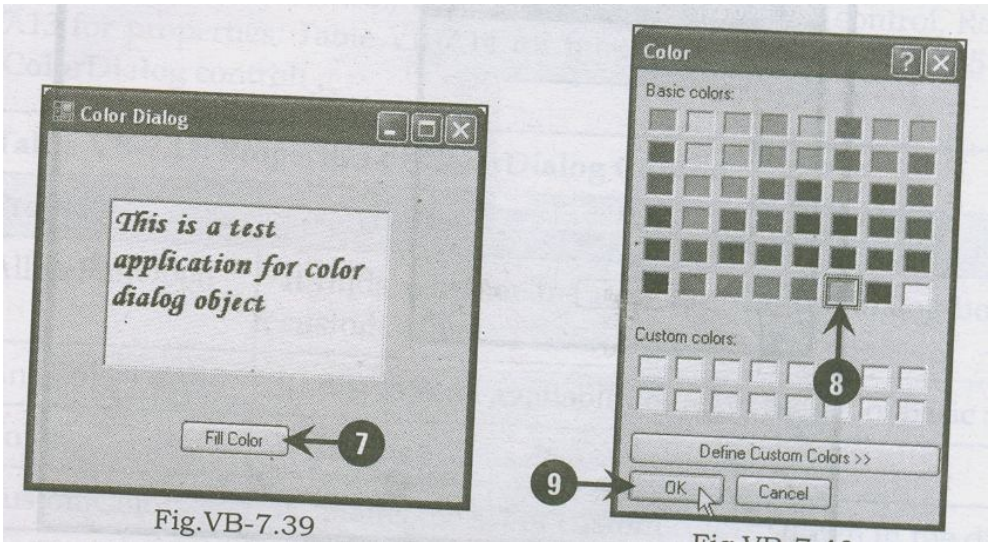


Fig.VB-7.39

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

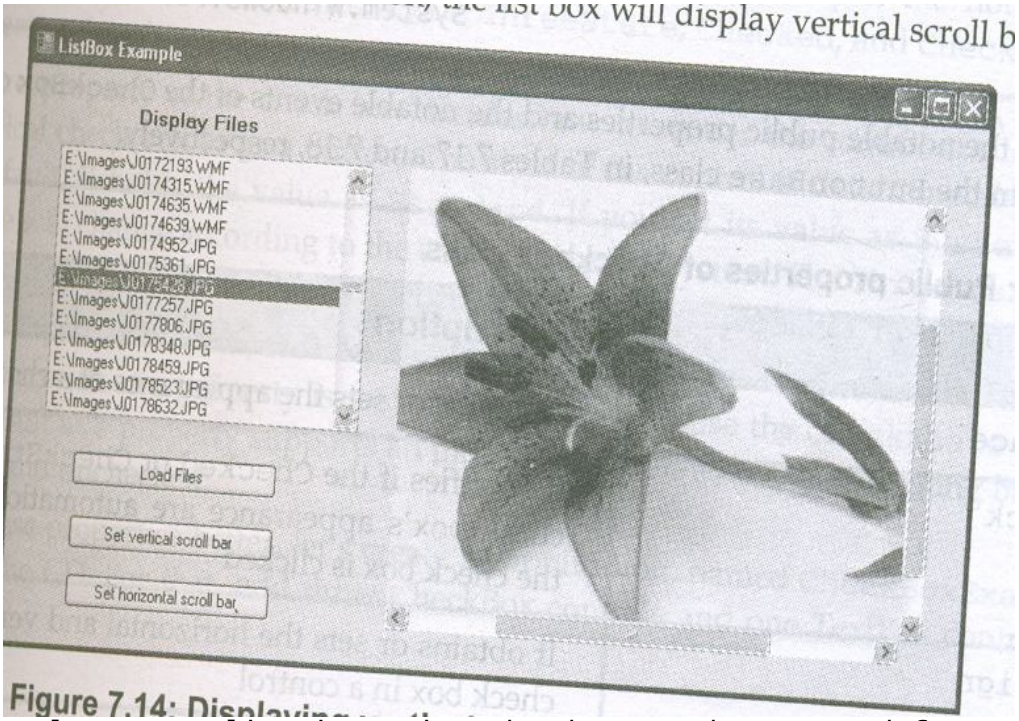
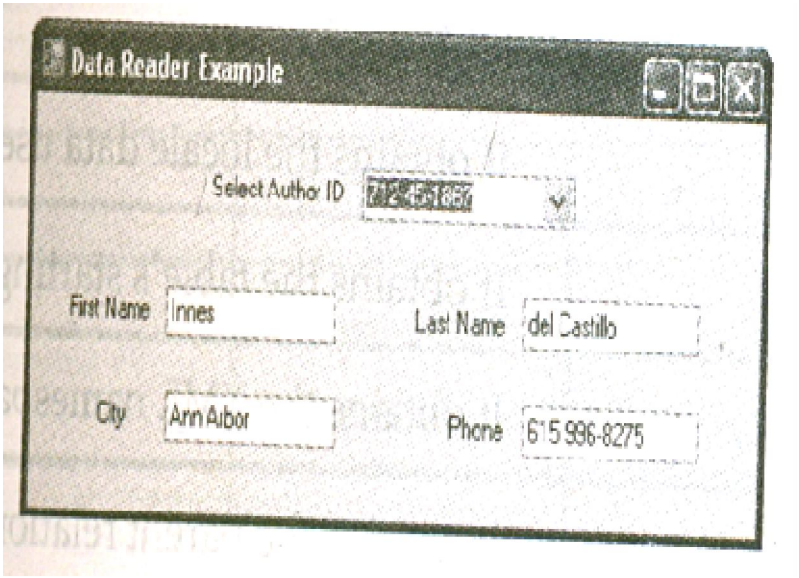


Figure 7.14: Displaying

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.

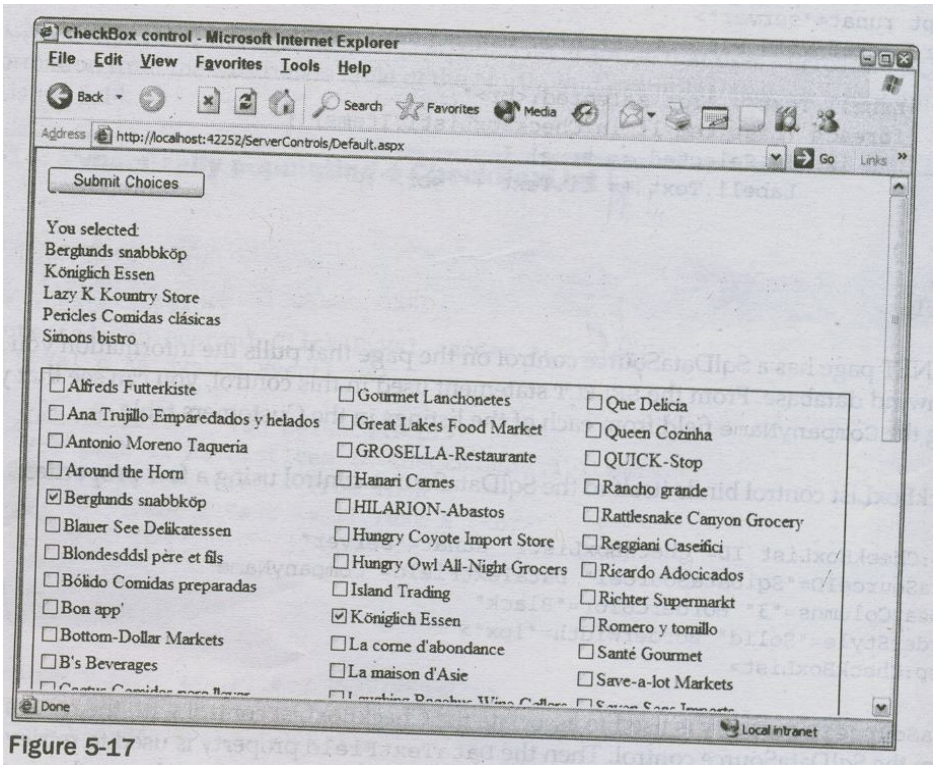


Figure 5-17

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

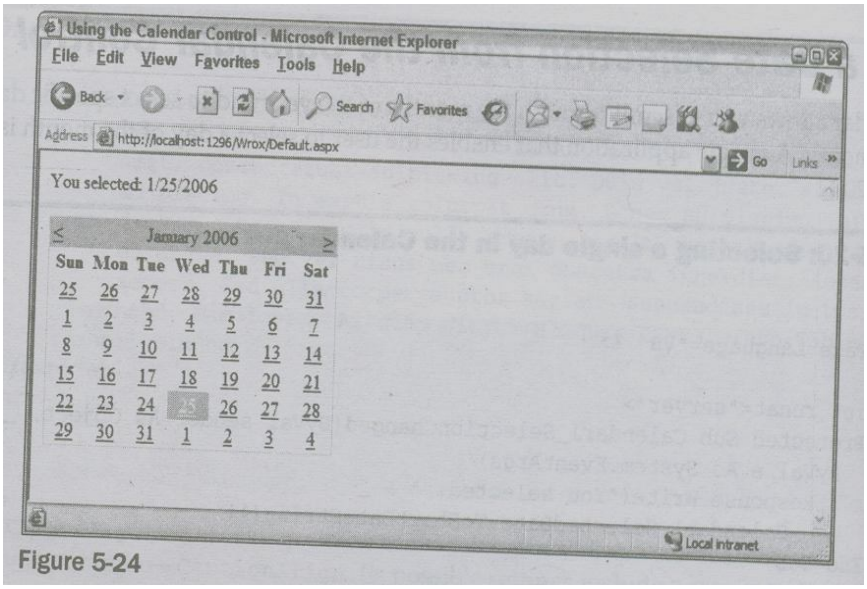
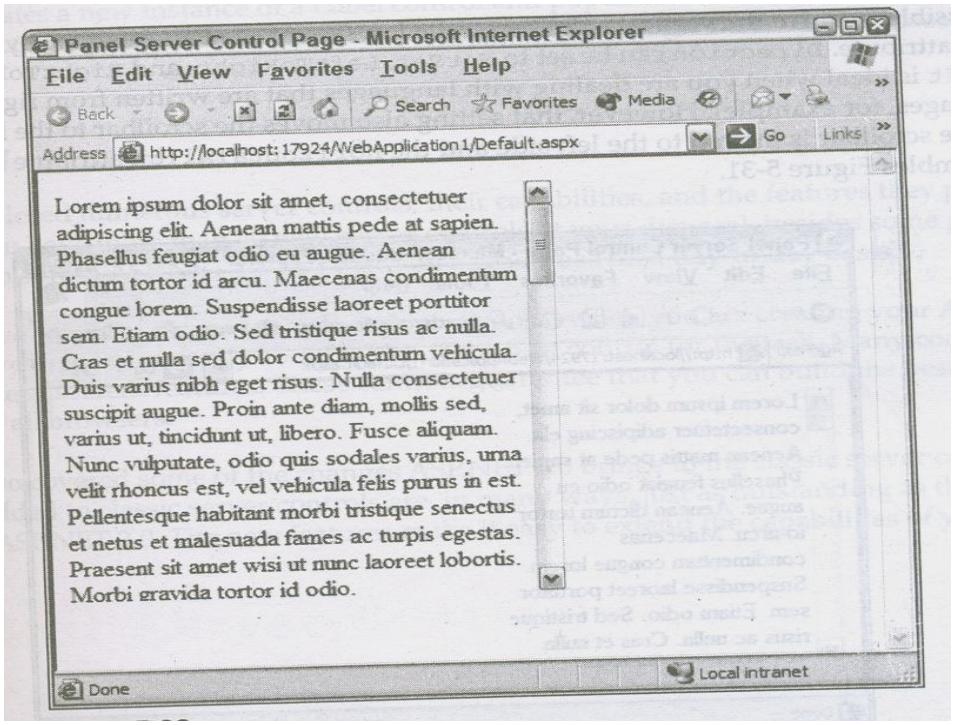


Figure 5-24

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.

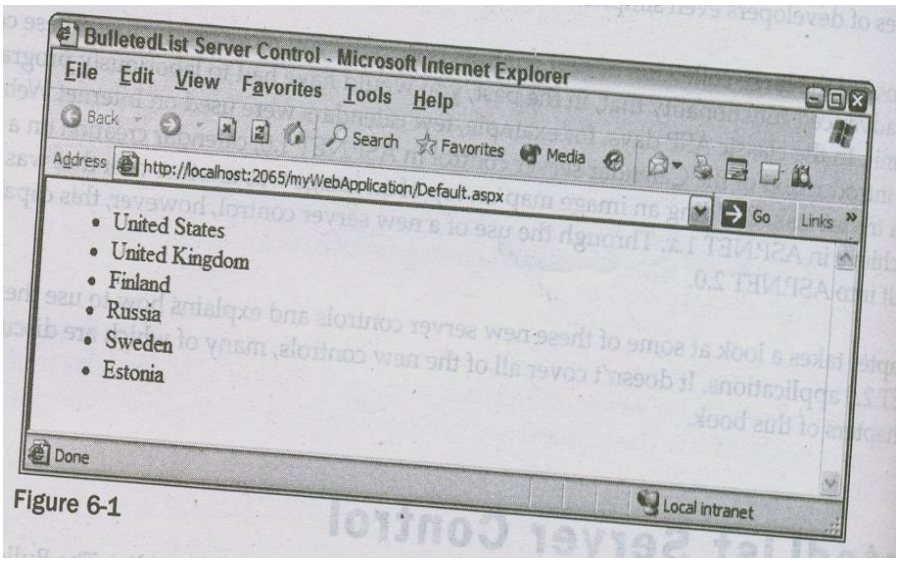
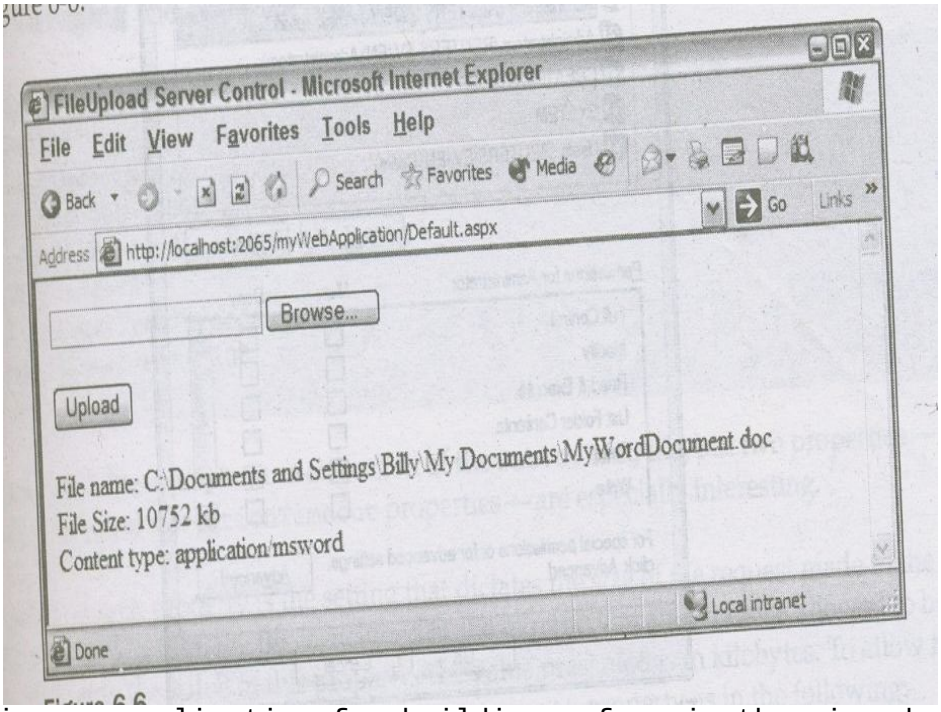
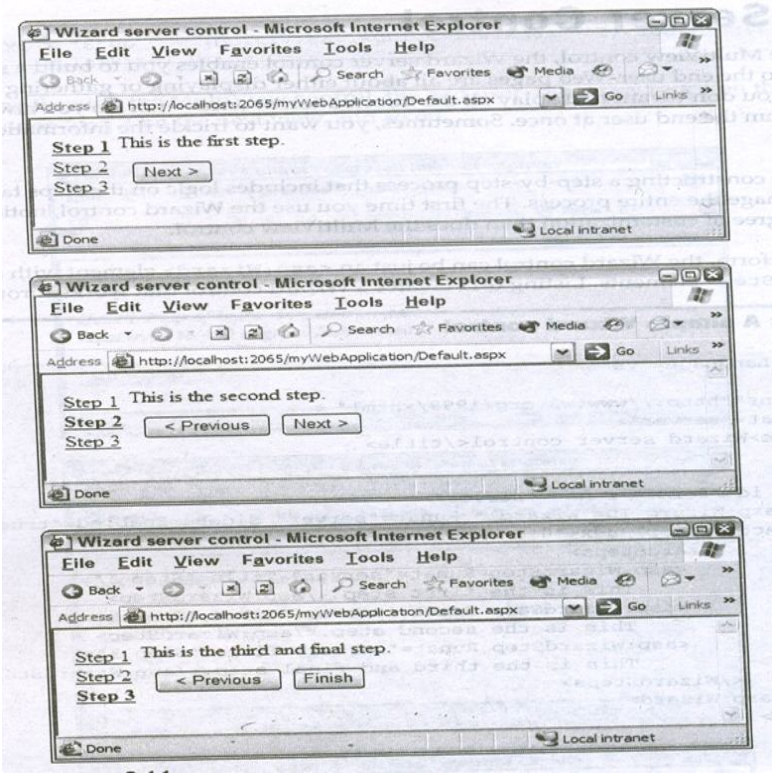


Figure 6-1

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.

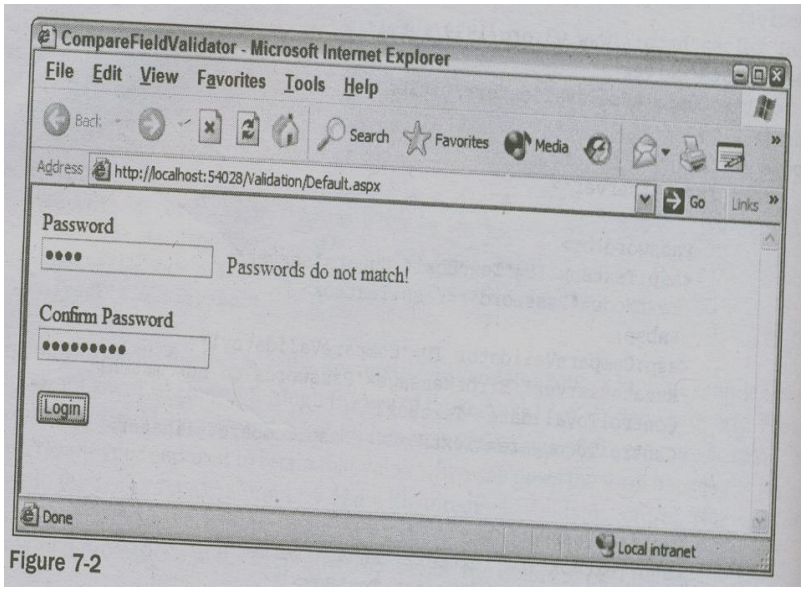


Figure 7-2

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

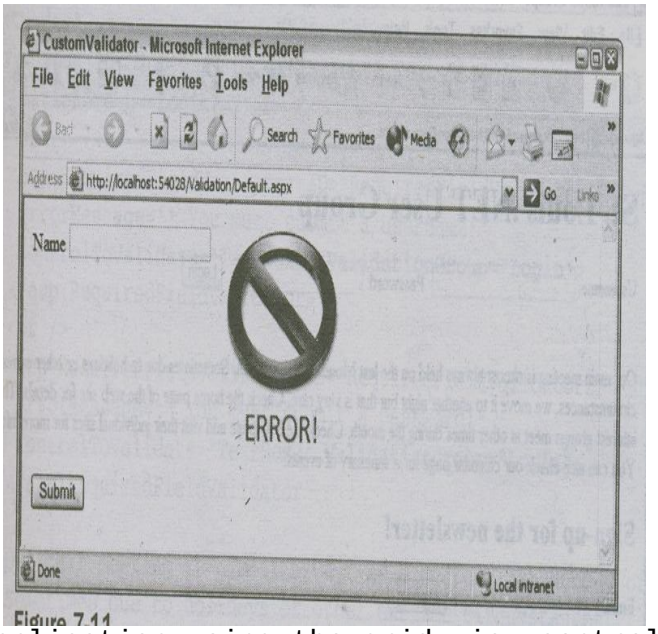
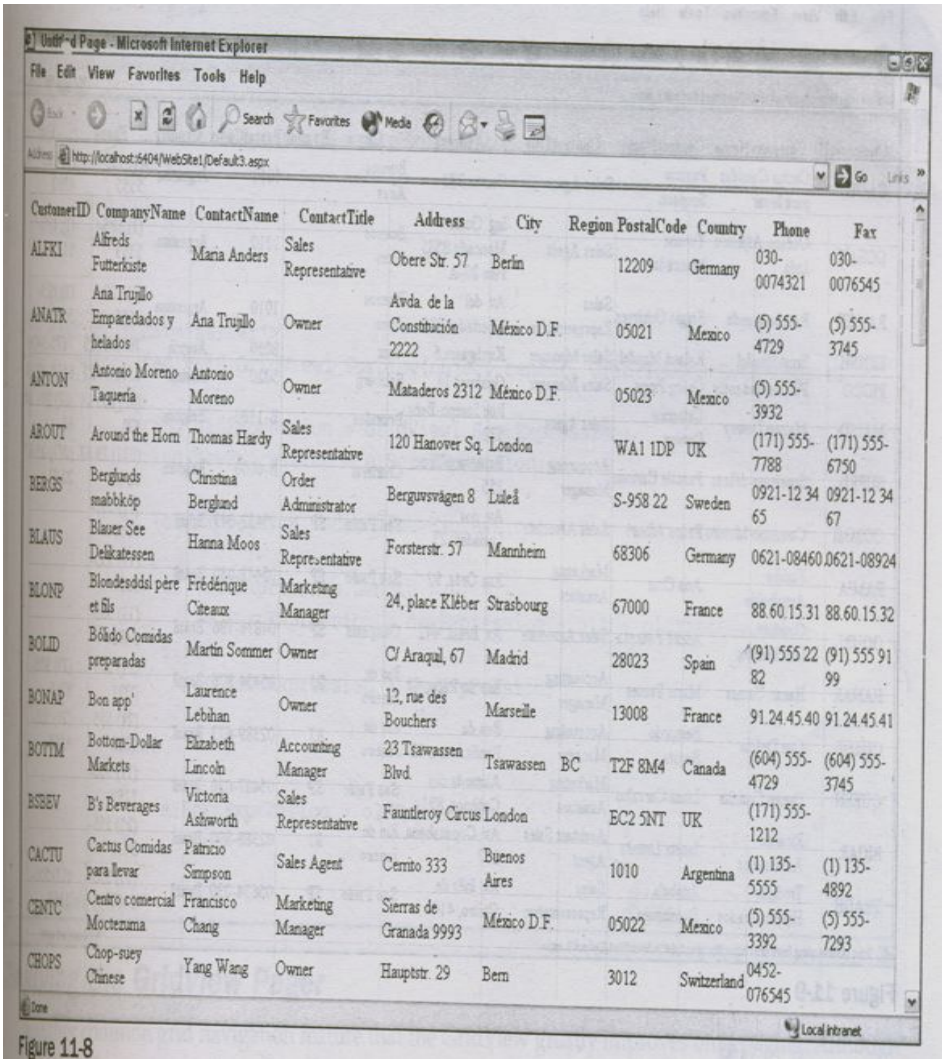


Figure 7.11

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.

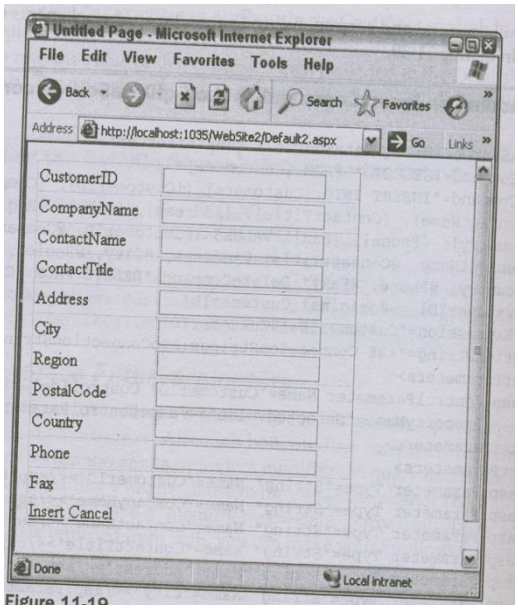


Figure 11-19

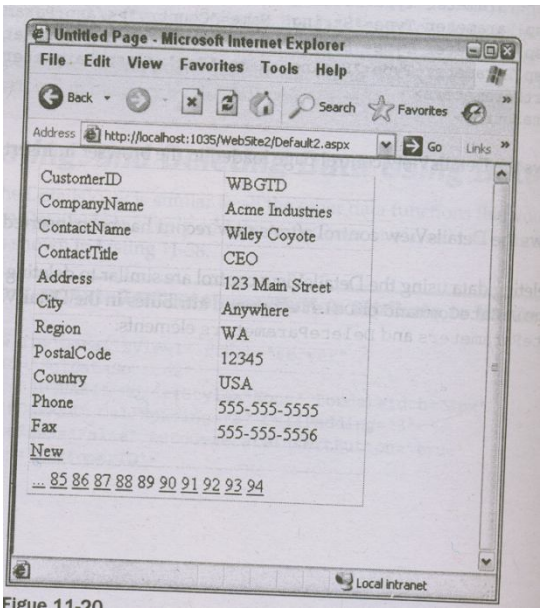
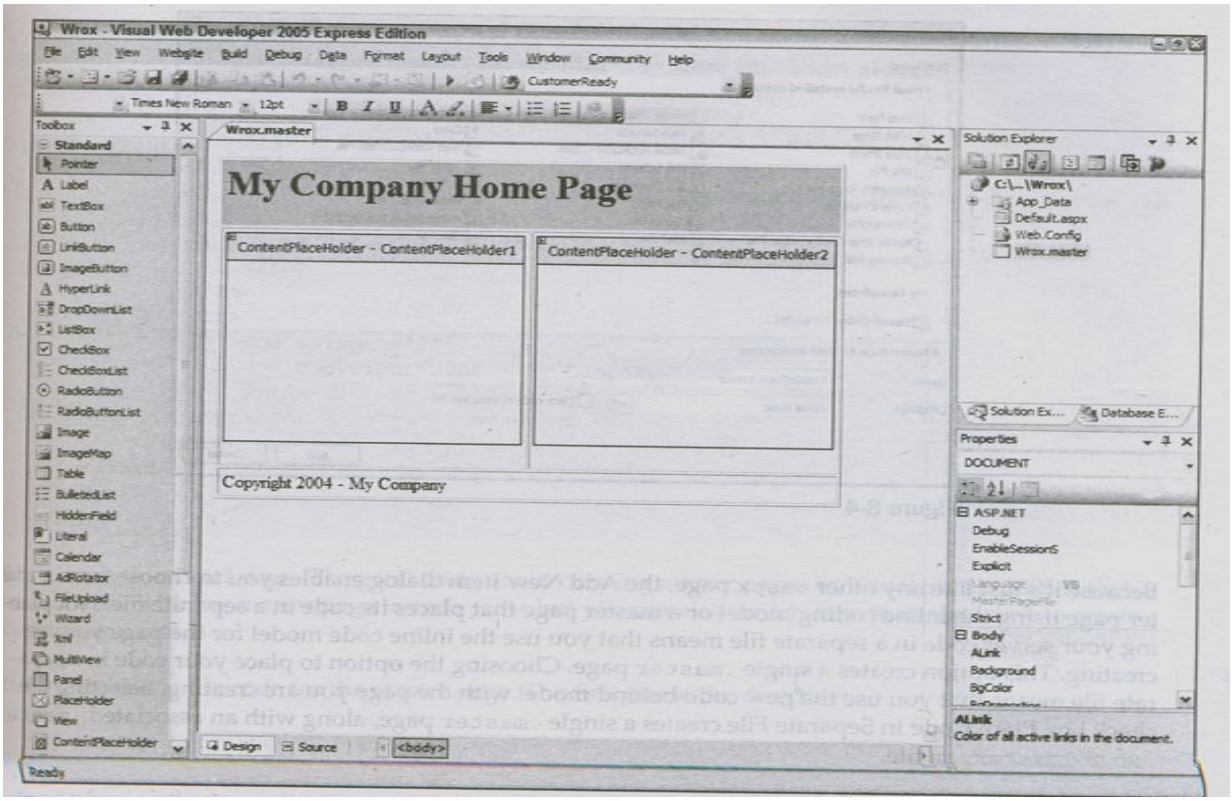


Figure 11-20

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

IV SEMESTER

MCS 401: DATA MINING AND BIG DATA

Unit – I

Data Warehouse and OLAP Technology: An Overview: What is Data Warehouse? - A Multidimensional Data Model - Data warehouse Architecture - From Data Warehousing to Data Mining

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

Unit – II

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

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

Unit – III

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

Unit – IV

Big Data: Introduction – distributed file system – Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications.

Hadoop: Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands, Anatomy of File Write and Read., Hadoop MapReduce paradigm. Writing Hadoop MapReduce Programs

Prescribed TextBooks:

1. Jiawei Han Micheline Kamber, “Data mining & Techniques”, Morgan Kaufmann publishers
2. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”, Wiley, ISBN: 9788126551071, 2015.
3. Chris Eaton, Dirk deroos et al. , “Understanding Big data ”, McGraw Hill, 2012.
4. Tom White, “HADOOP: The definitive Guide” , O Reilly 2012.

Model Paper

MCA 401 : Data Mining and Big Data

Time: 3 Hrs	**Max. Marks: 70**
Answer Question No.1 Compulsory:	**7 x 2 = 14 M**
Answer ONE Question from each unit:	**4 x 14 = 56 M**

1. a) Mention different OLAP operations
   b) Define Data Mining
   c) Explain in brief "Association Rule Mining"
   d) What is Prediction?
   e) Name the two data structures used in cluster analysis
   f) define primary and secondary name nodes.
   g) explain file read and write commands in hadoop

UNIT – I

2. a) What are the different data partitioning techniques and explain the importance of data partitioning?
   b) What is ETL Process and explain the ETL Architecture

OR

3. a) Explain the major issues in data mining
   b) Explain data mining as a step in the process of knowledge discovery

UNIT – II

4. a) How can we mine multilevel Association rules efficiently using concept hierarchies? Explain.
   b) Explain Apriori algorithm with example and how the efficiency of Apriori algorithm can be improved.

OR

5. a) Write a brief on classification of data mining systems
   b) Can we design a method that mines the complete set of frequent item sets without candidate generation? If yes, explain with example.

UNIT – III

6. a) Explain different grid-based clustering methods
   b) What are the typical requirements of clustering in data mining? Explain

OR

7. Write algorithms for k-Means and k-Medoids and explain how they work with example.

UNIT – IV

8. a) What is Bigdata? and discuss in detail why big data is more important with real time examples
   b) Discuss Bigdata in terms of three dimensions, volume, variety and velocity

OR

9. a) Discuss the design of Hadoop distributed file system and concept in detail
   b) Explain in detail about map-reduce in detail and discuss partitioning and combining

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: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

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)

3. a) What are the steps involved in designing custom single – purpose processor.
b) Explain RT-level custom single purpose processor design.

Unit-II

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

(or)

5. a) Explain pulse width modulators.
b) Explain stepper Motor controllers.

Unit-III

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

(or)

7. a) Describe different types of serial, parallel and wireless protocols.
b) Discuss different arbitration methods.

Unit-IV

8. Illustrate the Design of a Digital Camera.

(or)

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

MCS 402.2: CLOUD COMPUTING

UNIT-I

Introduction: Cloud computing at a glance, Historical Developments, Building Cloud Computing Environments, Computing Platforms and Technologies.

Principles of Parallel and Distributed Computing: Eras of Computing, Parallel Vs Distributed computing, Elements of Parallel Computing, Elements of Distributed Computing, Technologies for Distributed Computing.

Virtualization: Introduction, Characteristics of Virtualized Environments, Taxonomy of Virtualization Techniques, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples.

UNIT-II

Cloud Computing Architecture: Introduction, Cloud reference model, Types of clouds, Economics of the cloud, open challenges.

Aneka: Cloud Application Platform: Framework Overview, Anatomy of the Aneka Container, Building Aneka Clouds, Cloud programming and Management.

Concurrent Computing: Thread Programming : Introducing Parallelism for Single machine Computation, Programming Application with Threads, Multithreading with Aneka, Programming Applications with Aneka Threads.

UNIT-III

High- Throughput Computing: Task Programming: Task Computing, Task-based Application Models, Aneka Task-Based Programming.

Data Intensive Computing: Map-Reduce Programming: What is Data-Intensive Computing, Technologies for Data-Intensive Computing, Aneka MapReduce Programming.

UNIT-IV

Cloud Platforms in Industry: Amazon Web Services, Google AppEngine, Microsoft Azure, Observations.

Cloud Applications: Scientific Applications, Business and Consumer Applications.

Advanced Topics in Cloud Computing: Energy Efficiency in Clouds, Market Based Management of Clouds , Federated Clouds/ InterCloud, Third Party Cloud Services.

Prescribed Book:

Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi, "Mastering Cloud Computing", Mc Graw Hill Education.

REFERENCES:

1. Michael Miller, “Cloud Computing”, Pearson Education, New
2. Haley Beard, Cloud Computing Best Practices for Managing and MeasuringProcesses for On-demand Computing, Applications and Data Centers in theCloud with SLAs, Emereo Pty Limited, July 2008.
3. Cloud Application Architectures, George Reese, ISBN: 8184047142,Shroff/O' Reilly, 2009.

Model Paper

MCA 402.2: Cloud Computing

Time: 3 Hrs **Max. Marks: 70**

Answer Question No.1 Compulsory: 7 x 2 = 14 M
Answer ONE Question from each unit: 4 x 14 = 56 M

1.
a) What is Service-Oriented Computing?
b) Define a Distributed System?
c) Give an example for full virtualization and brief about it.
d) What is a hybrid cloud?
e) Scalability
f) Give two examples of cloud applications in CRM and ERP.
g) What is a MOCC?

UNIT – I

2. Discuss about the historic developments from early computing to the contemporary cloud computing.

or

3. a) What are characteristics of Virtualization?
b) Discuss about Machine Reference Model.

UNIT – II

4. a)Discuss about the cloud architecture.
b) What are different types of clouds? Explain.

or

5. a) Explain about Aneka Framework overview.
b) Discuss about Aneka SDK.

UNIT - III

6. a)What is Task computing and what are its frame works?
b)Discuss about Task based application models.

or

7. a) What is Data Intensive Computing? Explain about its characteristics.
b) What are the technologies required for Data Intensive computing? Explain about them.

UNIT – IV

8. Discuss about Amazon Web Services.

or

9.Give a reference model for MOCC. What are the technologies for MOCC?

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, Addison Wesley (1993)
Russell & Norvig : Artificial Intelligence A Modern approach, Pearson education Asia
Donald A. Waterman A guide to expert systems, Pearson Education India.

Computer science

Paper: MCS 403.1 Artificial Intelligence

Time: 3 Hrs **Max Marks: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**

Answer ONE Question from each unit: **4 x 14 = 56 M**

1. Explain the following
   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?

UNIT-I

2. a) Explain the concept of problem reduction with an example?
   b) Trace the constraint satisfaction procedure solving the following crypt arithmetic problem

BEST
MADE
MASTER

(or)

3. Write about AO* algorithm

UNIT-II

4. 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))

(or)

5. a) Represent the following sentences using semantic nets
   "All students answered all questions in all possible ways"
   b) Built-up the CD structure for the following sentences
   i) "While crossing sea , Hanuman saw a cannibal"
   ii) "Americans bombed Hiroshima

UNIT-III

6. a) Give the architecture of an expert system?)
   b) What are expert system shells

(or)

7. Discus briefly about frames

UNIT-IV

8. a) What is a production system ? Explain it's characteristics?
   b) Write a script to visit to a restaurant

(or)

9. a) What is non-monotonic reasoning
   b) Explain a Justification Based Truth Maintenance System(JTMS)

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: 70**

Answer Question No.1 Compulsory: **7 x 2 = 14 M**
Answer ONE Question from each unit: **4 x 14 = 56 M**

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.

Unit – I

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

(or)

3. (a)Develop a theatre booking application.
(b)Compare wireless networks with wired networks.

Unit –II

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

(or)

5. Explain tunneling operations in mobile IP and also the relation ship between mobile IP and cellular IP.

Unit – III

6. (a)Explain MMS environment.
(b)List out 3G applications.

(or)

7. (a)Explain WAE logical model.
(b)Explain the applications for GPRS.

Unit –IV

8. (a)Compare between H.323 and SIP.
(b)Discuss the features of Wi – Fi.

(or)

9. Discuss the various security models in mobile computing.

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