

Paper No. : Computer III
Paper Title : Data Structure in C++

Object Oriented Programming: C++

1 Introduction

- 1.1. Introduction to Object Oriented Programming\
- 1.2. C++ fundamentals

2 Classes and Objects

- 2.1. Classes
- 2.2. Constructors and Destructors
- 2.3. Inline functions
 - 2.3.1 Defining inline functions within a class
- 2.4. Friend functions and classes
- 2.5. Static class members
 - 2.5.1 Static data members and member functions
- 2.6. Local and nested classes
- 2.7. Passing objects to functions and returning objects form functions
- 2.8. Object assignment

3 Arrays, Pointers, References and the Dynamic Allocation Operators

- 3.1. Arrays of objects
- 3.2. References
- 3.3. Dynamic allocation operators
- 3.4. Pointers to objects
- 3.5. **'this'** pointer

4 Function overloading, copy constructor and Default arguments

- 4.1. Function overloading
- 4.2. Overloading constructor function
- 4.3. Copy constructor
- 4.4. Default arguments

5 Operator overloading

- 5.1. Creating a member Operator Function
- 5.2. Overloading unary, binary relational and logical operators
- 5.3. Operator overloading using friend functions

6 Inheritance

- 6.1. Base class access control
- 6.2. Inheritance and protected members
- 6.3. Inheriting multiple base class
- 6.4. Constructors, destructors and inheritance
- 6.5. Virtual base class

7 Virtual functions and polymorphism

8 Templates

- 8.1. Generic functions
- 8.2. Applying generic functions
- 8.3. Generic classes

9 Exception handling

- 9.1. Exception handling fundamentals
- 9.2. Handling derived class exceptions

10 I/O system

- 10.1. Stream and stream classes
- 10.2. formatted I/O
- 10.3. FILE I/O
 - 10.3.1. Opening and closing files
 - 10.3.2. Reading and writing text files
 - 10.3.3. Unformatted and binary I/O

DATA STRUCTURES

11 Primitive data structure and operations on them

12 Non primitive data structure

- 12.1. Arrays
 - 12.1.1. Single and multiple array
 - 12.1.2. Storage representations
 - 12.1.3. Operations
- 12.2. Stack
 - 12.2.1. Operations on stack
 - 12.2.2. Application in recursion, polish notation etc.
- 12.3. Queues
 - 12.3.1. Types of queue
 - 12.3.2. Operations on queue and applications
- 12.4. Linked lists
 - 12.4.1. Types of linked list
 - 12.4.2. Operations on linked lists and applications
- 12.5. Tree
 - 12.5.1. Concept and definition of tree & operations
 - 12.5.2. Binary tree, 2-3 tree, height and weight balanced tree
 - 12.5.3. Linked and threaded representation of tree and applications

13 Sorting and searching

- 13.1 Bubble sort, Insertion sort, selection sort, quick sort
- 13.2 Sequential search
- 13.3 Binary search

Recommended References Books :

1. The complete reference C++ : - Herbert Schildt, TMH
2. Object oriented programming in C++ :- Robert lafore Galgotia Publications
3. C++ :- Effective object oriented software construction – Kayshav dattari
4. Object oriented programming in C++ :- Addison Wesley
5. Object oriented programming in C++ :- Balaguruswamy
6. Wirth, Nielus, Algorithm+Data structure programs:- Prentice Hall
7. Wirth, Nielaus , Algorithm + Data structure programs:- Prentice Hall
8. Knuth D. The art of computer programming vol 1-2 :-Addison Wesley
9. Aho A. V. Hopcroft & ullman, Data structure & algorithms:- Addison Wesley

NOTE : Practical shall be based upon the above syllabus.

Paper No. : Computer IV
Paper Title : System Development Tools

Visual Basic .NET

1 Overview of Microsoft .NET Framework

- 1.1. What is .NET Framework and its benefits
- 1.2. The Common Language Runtime(CLR), purpose of CLR
- 1.3. Managed/ Unmanaged code, Compilation and Execution
- 1.4. Memory Management, Garbage collection
- 1.5. The .NET framework class library
- 1.6. .NET Web Services
- 1.7. Introduction to MS visual studio .NET

2 VB.NET programming language

- 2.1. Data Types, Type Conversion Functions, Operator and expressions
- 2.2. Variable declaration: Levels, Lifeline, Scope and Accessibility
- 2.3. Array : Multidimensional, Jagged array
- 2.4. Collections, User Defined Data types
- 2.5. Decisions Structures
- 2.6. Loop Structures: While, Do..Loop, For..Next, For Each..Next, With..End With
- 2.7. Nested Control Statements, Exit & End statements
- 2.8. Procedures.

3 Console Applications

- 3.1. Console Class
- 3.2. Handling Strings, Characters and Dates

4 Object Oriented Programming

- 4.1. Classes: Methods, Properties, Fields, Events
- 4.2. Overloading
- 4.3. Constructors and Destructors.
- 4.4. Creating and using objects, managing groups of objects
- 4.5. Abstraction Encapsulation and Polymorphism

5 Designing User Interface

- 5.1. Working with Forms
- 5.2. Basic Windows Controls
- 5.3. Menus, Timer, Common Dialog Controls, rich text box
- 5.4. Treeview and listview controls, toolbar, statusbar
- 5.5. SDI and MDI Applications

6 Data Access

- 6.1. History Of Microsoft Data Access Technologies
- 6.2. Overview Of ADO .NET
- 6.3. The Server Explorer and Query Builder
- 6.4. ADO.NET object model
- 6.5. Programming with ADO.NET

Advanced Visual Basic.NET and ASP.NET

1 Data Reporting Tool(Crystal Report)

- 1.1 Designing report with and without Report Expert
- 1.2 Record Selection Expert
- 1.3 Sorting, Grouping and Totaling Data on Report
- 1.4 Report Formulas and Report Parameters
- 1.5 Accessing and manipulating report from VB.Net

2 Exception Handling

- 2.1 Error in programming
- 2.2 Exception Handling overview
- 2.3 Structures exception handling
- 2.4 Programmer-Defined exception class
- 2.5 On Error... Statements
- 2.6 Debugging

3 Multithreading

- 3.1 Introduction TO thread
- 3.2 Life Cycle Of a Thread
- 3.3 Creating Multithreading application
- 3.4 Thread Priorities & Thread scheduling
- 3.5 Thread Synchronization

4 Introduction to Web Programming

- 3.1 Introduction to HTML
- 3.2 Overview of ASP.NET
- 3.3 Building a Web Application
- 3.4 Building Forms with Web Controls
- 3.5 Validation User Input
- 3.6 Session Tracking

5 ASP.NET Database programming

- 4.1 Understanding Data Binding
- 4.2 Working with Data Grids

Recommended References Books :

- 1. Mastering Visual Basic. NET by Evangelos Petroustos BPB
- 2. Professional VB.Net 2003,2004 edition
By bill evjen, billy hollis, Rockford lhotka et al.- worx, wiley dreamtech
- 3. Visual basic .net programming Bible by Bill evjen, Jason beres et al – Wiley dreamtech
- 4. Visual basic .net how to program 2nd edition By. H.M. Deitel, P.J. Deitel, T.R. Nieto person education (Low price edition)
- 5. Data base access with visual basic.NET 3rd edition by Jeffery P. Mo manus Jackie Goldstein-person education (Low price edition)
- 6. Asp.net bible by mrudulla parihar et al. – IDG Books India

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

PROPOSED SYLLABUS : S.Y. B.Sc COMPUTER SCIENCE

With effect from June 2011

7. Building XML webservices for Asp.Net by Bill evjen wiley dreamtech

NOTE : Practical shall be based upon the above syllabus.

Paper No. : Computer V
Paper Title : Relational Database Management System

1 Introduction to DBMS

- 1.1 What is database
- 1.2 Requirements of database system
- 1.3 Data Models and Data Independence
- 1.4 DDL and DML
- 1.5 Database Manager, Database Administrator

2 Entity Relationship Models

- 2.1 Entities and entity sets
- 2.2 Relationship and relationship sets
- 2.3 Mapping constraints
- 2.4 Primary keys
- 2.5 Entity relationship diagram and reducing it to tables
- 2.6 Generalization and specialization
- 2.7 Aggregation

3 Relational Model

- 3.1 Structure of Relational database
- 3.2 Relational Algebra

4 Relational Database Design

- 4.1 Functional dependencies
- 4.2 Referential integrity
- 4.3 Need for normalization
- 4.4 Normal forms
- 4.5 Data dictionary
- 4.6 Tables, Table spaces & Data files, Views

5 Crash Recovery

- 5.1 Failure Classification
- 5.2 Transactions
- 5.3 Incremental log with differed and immediate updates
- 5.4 Checkpoints
- 5.5 Buffer Managements
- 5.6 Shadow Paging
- 5.7 RAID

6 Concurrency Control

- 6.1 Lock based protocols
- 6.2 Timestamp-based protocols
- 6.3 Validation based protocols

7 Security Control and Integrity

7.1 Security and Integrity Violation

7.2 Authorization and Views

7.3 Encryption

8 SQL

8.1 Overview of SQL

8.2 Various types of data, conversions and terminology

8.3 Retrieval of information from tables:

Making a query, SELECT Command, Column Recording, Use of Relational Operators, Use of Boolean Operators, Operations like IN, BETWEEN, LIKE NULL, NOT, etc., Aggregate Functions, COUNT, GROUP BY Clause, HAVING Clause.

8.4 Formatting Query Output:

String and Expressions, Ordering Outputs by Fields, Multiple Columns, Aggregate Group, Column No., ORDER BY, With NULL.

8.5 Querying multiple tables:

Joining Tables through Referential Integrity, Equi joins and other kinds of Joins, joins of More than Two Tables, Joining a table to itself.

8.6 Subqueries

DISTINCT with subqueries, Predicates with subqueries, Aggregate functions in subqueries, Correlated subqueries, Correlating table to itself, Correlated subqueries in HAVING, Correlated subqueries and Joins, EXISTS Operator, Using Exists with Correlated subqueries, Combining EXISTS and Joins, Special Operator ANY or SOME, ALL, UNION

8.7 Entering, Deleting and Changing Field Values

DML Update Command, UPDATE with Multiple Columns, UPDATIng to NULL Values, INSERT Command, using subqueries with UPDATE Command

8.8 CREATE TABLE Command

Indexing, Altering a Table, Dropping a Table, Constraining a Table, Declaring Constraints, PRIMARY KEY Constraint, Foreign and Parent Keys, Multicolumn Foreign Keys, FOREIGN KEY Constraints, Foreign Key Restrictions.

8.9 CREATE VIEW Command

Updating Views, Group Views, Views and Joins, Views and Subqueries, Changing values through Views, GRANT Command using ALL and PUBLIC Arguments, GRANT OPTION.

8.10 PL/SQL

8.10.1 Using Variables, Constants and Data types.

8.10.2 User-Defined RECORD and TABLE data types.

8.10.3 Assigning Database Values to variables SELECTINTO.... CURSORS

8.10.4 Using Flow Control Statements, The IF.....THEN Statement, The LOOP statement, WHILE loops, the GOTO statement.

8.10.5 Error handling, Built in PL/SQL Exception, User-defined Exceptions, Unhandled Exception.

8.10.6 PL/SQL Programs. Anonymous PL/SQL Blocks, Procedures,Functions, packages, Triggers.

Recommended References Books :

1. Henry korth & silbershats, Databse system concepts
2. C.J. Date, Introduction to database design, addition welsey, nasora martin gruber, understanding SQL, BPB pub New delhi
3. Ivan bayross, SQL, PL/SQL The programming language of ORACLE, BPB Pub, New Delhi
4. James Martin, Computer Database organization , PHI , New Delhi
5. J Ullman, Principles of Database systems, Galagoriaub, New Delhi
6. Oracle Manuals
7. SQL Manuals
8. George Koch and Kevin Loney – The complete, Reference ORACLE press TMH, Delhi
9. Oracle PL / SQL programming Oracle Press – Tata Mcgrawhill
10. Microsoft SQL server – PHI pub

NOTE : Practical shall be based upon the above syllabus.