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 from 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++ :- Rebert lafore Galgotia Publications
3. C++ :- Effective object oriented software construction – Kayshav dattari
4. Object oriented programming in C++ :- Addition Wesley
5. Object oriented programming in C++ :- Balaguruswamy
7. Wirth, Niclaus , Algorith + Data structure programs:- Prentice Hall
8. Knuth D. The art of computer programming vol 1-2 :-Addition Wesley
9. Aho A. V. Hoperott & ullman, Data structure & algorithms:-. Addition Wesley

NOTE : Practical shall be based upon the above syllabus.
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 Petroutsos BPB
   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 – Wlley dreamtech
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
7. Building XML webservices for Asp.Net by Bill Evjen Wlley 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 Opearotor 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 SELECT .....INTO…. 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, Database 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
10. Microsoft SQL server – PHI pub

NOTE: Practical shall be based upon the above syllabus.