Veer Narmad South Gujarat University, Surat.
Syllabus
M.C.A (3rd semester)
Effective from :July 2010
Paper : 301 : Client Server Architecture

1. Database Computing Model

Client Server Computing: Functions of client, server, middleware components. Advantages and limitations of client server computing

Three Tier Architecture: Overview of thin client, application server, web server.

Overview of Distributed Database

Overview of Real Application Clusters

Overview of High Performance Database Computing

Overview of Data Warehousing and Data Mining

2. Overview of Oracle Database Server Architecture

2.1 Architecture of Oracle Database and Oracle Instance
2.2 Overview of Physical and Logical Structures
2.3 Dedicated and Shared Server Configuration
2.4 Oracle Server Startup and Shutdown
2.5 Creating Database

3. Oracle Tools and Utilities
   - 3.1 SQL
   - 3.2 Pl/SQL Procedural Extension.
     - 3.2.1 Overview, PL/SQL data types & Control Structures
     - 3.2.1 Cursors
     - 3.2.2 Stored Procedures & Functions
     - 3.2.3 Database Triggers
     - 3.2.4 Package Creation
     - 3.2.5 Dynamic SQL
     - 3.2.6 Collections & Objects

4. Database Administration
   - 4.1 Managing Users
     - 4.1.1 User Authentication Methods
       - 4.3.2.1 Password Authentication
       - 4.3.2.2 O.S Authentication
     - 4.1.2 User Configuration Setup
       - 4.1.2.1 Profiles
       - 4.1.2.2 Default Table space
       - 4.1.2.3 Temporary Table space

4.1.3 Resource Management
4.1.3.1 Quotas
4.1.4 Working with user database account
4.1.4.1 Creating, Modifying and deleting user account
4.1.4.2 Changing password

4.2 Backup & Recovery
4.2.1 Types of Backup
4.2.1.1 Control file, Redo log file, cold and hot backup
4.2.2 Types of Database failures
4.2.3 Recovery Methods
4.2.3.1 Cold Restore, full Database Recovery, Time based recovery

4.3 Database Security
4.3.1 Authentication
4.3.2 Privileged Accounts & Privileges
4.3.3 Object Security
4.3.4 System security
4.3.5 Database Roles
4.3.6 Database Auditing

5. Oracle Pre-Compiler (Pro*C++)

6. Self Study**:** Overview of Grid Based Database Computing, Calling External Routines from PL/SQL

Reference Books:

1. Oracle 9i PL/SQL Programming: Scott Urman, Oracle Press
2. Oracle DBA Fundamentals-I , Oracle Press
3 Effective PL/SQL, Apress
4 Expert Oracle Database Architecture 9i and 10g – Tom Kyte, Apress
5 Effective Oracle By Design: Tom Kyte, Oracle Press
6 Oracle 24 X 7 Tips and Techniques: Venkat Devraj, Oracle Press
7 Expert Oracle Database 11g Administration, Alpati, Wiley Student Edition
8 Fundamentals of Database Management System, Gilleneon, Wiley Student Edition
9 SQL & PL/SQL for Oracle 11g Black Book, Deshpande, Wiley Student Edition
10 Beginning Oracle Database 11g Administration from novoice to professional, Iggy Fernandez, Apress/Springer
11 Oracle PL/SQL by Example, Benjamin Rosenweig & Elena Silvestrova 4/e,Pearson

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Syllabus
M.C.A (3rd semester)
Effective from :July 2010
Paper : 302 : Operating System

1 Operating System & Process Management
- 1.1. History of Operating Systems
- 1.2. Operating System Services
- 1.3. System Calls
- 1.4. Operating System Structure
- 1.5. Process, Multiprogramming, Multitasking
- 1.6. Process States, Context Switching
- 1.7. Process Scheduling
- 1.8. Scheduling Algorithms
- 1.9. Multithreading, Treading Issues

2. Process Coordination
- 2.1. The Critical-Section Problem
- 2.2. Peterson's Solution, Hardware, Semaphore
- 2.3. Classic Problems of Synchronization
- 2.4. Monitors
- 2.5. Introduction to Deadlock
- 2.6. Characteristics
- 2.7. Deadlock Prevention, Avoidance
- 2.8. Deadlock Detection, Recovery

3. Memory Management
- 3.1. Introduction
- 3.2. Swapping, Contiguous Memory Allocation
- 3.3. Paging
- 3.4. Structure of Page Table
- 3.5. Segmentation
- 3.6. Demand Paging
- 3.7. Page Replacement
- 3.8. Thrashing, Other issues

4. File System
- 4.1. File, Access Methods, Directory Structure
- 4.2. File-System Mounting
- 4.3. File Sharing, Protection

4.4. File-System Implementation
4.5. Directory Implementation
4.6. Allocation Methods
4.7. Free-Space Management
4.8. Log-Structured File-System
4.9. Disk Scheduling, Management

5. Security, Protection and Other Issues
   5.1. System Protection: Goals, Principles, Domain
   5.2. The Security Problem
   5.3. Program Threats
   5.4. System and Network Threats
   5.5. Cryptography as Security Tool
   5.6. User Authentication
   5.7. Implementing Security Defenses
   5.8. Overview of Network and Distributed Operating System

Self Study:

Introduction to FreeBSD and Windows Server 2008

Reference Books:

1. Operating Systems: A Concept-based Approach by Dhamdhere, TMH
2. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne, Wiley India.
3. Modern Operating Systems by Andrew S. Tanenbaum, Pearson Edu./PHI
4. Operating Systems by Achyut Godbole, TMH.
5. Operating Systems by Halder and Aravind, Pearson.
6. Distributed Operating Systems by Tanenbaum, Pearson.
7. Distributed Operating Systems: Concepts And Design by Pradeep Sinha, PHI

Veer Narmad South Gujarat University, Surat
Syllabus
M. C. A. (3rd Semester)
Effective from: July 2010
Paper No.: 303 Software Engineering

1 **Introduction**
- 1.1 The role of software
- 1.2 Software Process
  - 1.2.1 Processes, Projects, and Products
  - 1.2.2 Component Software Processes
- 1.3 Characteristics of a Software Process
  - 1.3.1 Predictability
  - 1.3.2 Support Testability and Maintainability
  - 1.3.3 Early Defect Removal and Defect Prevention
  - 1.3.4 Process Improvement
- 1.4 Software Development Process
  - 1.4.1 A Process Step Specification
  - 1.4.2 Waterfall Model
  - 1.4.3 Prototyping
  - 1.4.4 Iterative Enhancement
  - 1.4.5 The Spiral Model

2 **Software Project Management**
- 2.1 Project Management Process
  - 2.1.1 Phases of Management Process
  - 2.1.2 Metrics, Measurement, and Models
- 2.2 S/W project planning
  - 2.2.1 Estimation, Decomposition techniques & models
  - 2.2.2 Risk Management
  - 2.2.3 Project scheduling & tracking

3 **Function-Oriented Analysis and Design**
- 3.1 Fact-finding techniques
- 3.2 Analysis Principles
- 3.3 Software Requirements specification
  - 3.3.1 Functional modeling & information flow
  - 3.3.2 Data Dictionary
  - 3.3.3 Introduction to behavior modeling
- 3.4 Design principles
- 3.5 Design concepts
- 3.6 Design Methods

4 **Software Quality Assurance**
- 4.1 Software Quality and Assurance
- 4.2 Software Reviews
- 4.3 Technical Reviews
- 4.4 Approaches to SDA
- 4.5 Software Reliability

5 **Software Testing**

- 5.1 Testing fundamentals
- 5.2 Testing Approaches
  - 5.2.1 White box testing
  - 5.2.2 Basis path methods
  - 5.2.3 Control structure testing
  - 5.2.4 Black box testing
- 5.3 Automatic Testing Tools
- 5.4 Software Testing Strategies
  - 5.4.1 Unit testing
  - 5.4.2 Integration testing
  - 5.4.3 Validation testing

6 Test Case Generation & Testing using Testing Tool

7 **Self Study**

Software Maintenance

- 7.1 The Maintenance Process
- 7.2 System Documentation

Assignment on SRS should be given and case studies may be carried out at appropriate stage of the course.

Reference Books:

1. R.S. Pressman : Software Engineering – A Practitioner's approach – McGraw Hill
2. Ian Sommesille : Software engineering – Addition Wesley
3. Stephan r. Schach : Software engineering with java – TMH
4. Developing software with UML (OO analysis & design in practice) – Bernd Oestereich
5. Software Engineering, Somerville, Pearson Education
6. Pankaj Jalote : An integrated approach to software engineering,3rd Edition – Narosa
7. Software Engineering Theory & Practice, Shari Lawrence Pfleeger, Pearson Ed.

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Syllabus
M.C.A (3rd semester)
Effective from :July 2010
Paper : 304 : Object Oriented Programming Methodology

1 Introduction to Object Oriented Paradigm
- 1.1 Overview of OMT
- 1.2 Types of other programming paradigm and O.O. paradigm
- 1.3 Introduction of O.O. analysis and design methods

2 Object Modeling & Design
- 2.1 Object & Classes
- 2.2 Links and Associations
- 2.3 Classification of Object
- 2.4 Aggregation & Generalization
- 2.5 UML : Introduction & Overview
  - 2.5.1 Use-cases and tasks
  - 2.5.2 Event Charts
  - 2.5.3 State Charts
  - 2.5.4 Finding use-cases
  - 2.5.5 Connecting use-case and class views
  - 2.5.6 UML notation review

3 Procedure Oriented Programming Vs. Object Oriented Programming
- 3.1 Structure & classes
- 3.2 Encapsulation & Data Hiding
- 3.3 Constructors
- 3.4 Friend Functions
- 3.5 Inline Functions
- 3.6 Dynamic Object Creation & Destruction
- 3.7 Destructors

4 Object Oriented Properties
- 4.1 Introduction to Object Oriented Properties
- 4.2 Abstraction
- 4.3 Polymorphism
  - 4.3.1 Operator Overloading
  - 4.3.2 Function Overloading & Type Conversions
- 4.4 Inheritance
  - 4.4.1 Types of Inheritance
  - 4.4.2 Constructor & Destructor calls during Inheritance
- 4.5 Dynamic Polymorphism
  - 4.5.1 Overriding
  - 4.5.2 Virtual Functions
  - 4.5.3 Abstract Class

5 Data Files

5.1 Streams
5.2 File Types and Modes
5.3 File Pointers & their manipulations
5.4 Sequential Input & Output operations
5.5 Random access
5.6 Error handling during File operations

6 Exception Handling

7 Self Study
Generic Programming
7.1 Template Classes & Function

Reference Books

1. The C++ Programming Language, Stroustrup, Addison Wesley
2. The Complete Reference C++, Schildt, Tata McGraw Hill
3. OOP in Tourbo C++, Robert Lafore, Galgotia Publication
4. C++ Primer, Lippman, Addition Wesley
5. Object Oriented Programming with ANSI and Turbo C++, Kamthane, Pearson Education
6. Thinking in C++, Bruce Eckel, Pearson
7. Object Oriented Modelling & Design, Rumbaugh…, PHI
8. Object Oriented Analysis & Design with Application, Grady Booch, LPE
9. Standard C++ with Object Oriented Programming, Paul S. Wang, Thomson
10. Object Oriented Design, Peter Coad, Prentice Hall
11. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modelling Language User Guide, Pearson Education.
12. Programming with ANSI C++, Bhushan Trivedi, Oxford University Press

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Paper : 305 : Interactive Computer Graphics

1. Introduction to Computer Graphics
    - 1.1 Image Processing as Picture Analysis
    - 1.2 Advantages of Computer Graphics
    - 1.3 Applications of Computer Graphics
    - 1.4 Basic Input and Output Technology used in Interactive Computer Graphics
    - 1.5 Graphics Standards

2 Display Devices
- 2.1 Hardcopy Display Devices
- 2.2 Display Technology
- 2.3 Raster-Scan Display
- 2.4 Video Controller
- 2.5 Image Scanners

3 Basic Raster Graphics Algorithms
- 3.1 Frame Buffers and Display Controllers
- 3.2 The output pipeline
- 3.3 Scan Converting Lines
    - 3.3.1 Incremental Algorithm
    - 3.3.2 Midpoint Line Algorithm
    - 3.3.3 Thick Line Drawing
- 3.4 Scan Converting Circles
    - 3.4.1 Eight-Way Symmetry
    - 3.4.2 Midpoint Circle Algorithm
- 3.5 Scan Converting Ellipses

4 Polygons
- 4.1 Polygons and its representation
- 4.2 Inside Tests
    - 4.2.1 Even-odd Method
    - 4.2.2 Winding Number Method
    - 4.2.3 Method of Index
- 4.3 Filling polygons
    - 4.3.1 Flood Fill
    - 4.3.2 Scan Line Fill
    - 4.3.3 Boundary Fill
- 4.4 Pattern Filling
- 4.5 Line Styles and Pen Styles

11.2.2 Simulating Acceleration

11.3 Motion Specifications

11.3.1 Direct Motion Specification

11.3.2 Goal Directed Systems

12 Introduction to OpenGL

12.1 Open GL Pipeline

12.2 Overview of OpenGL routine

12.2.1 OpenGL bitmap function

12.2.2 OpenGL output primitives

13 Self Study

OpenGL 2D function

Reference Books

1. Computer Graphics : Principles & Practice Second Ed. in C, Foley, Van Dam, Feiner, Hughes, Pearson Education, Eleventh Indian Reprint. 2004
2. Computer Graphics, Apurva A Desai, PHI Learning, 2009
3. Computer Graphics C Version, Donald Hearn & M. Pauline Baker, Pearson Education, Fifth Indian Reprint 2004
4. Computer Graphics, Herrington S. Prentice Hall
5. Principles of Interactive Graphics, Newman & Sproul , McGraw Hill
6. Interactive Computer Graphics, Giloi W.K. Prentice Hall
7. Computer Graphics with Multimedia, A Rajaraman, Narosa
8. Computer Graphics with OpenGL , Hearn, Baker, Pearson, IIIrd Edition