

**VEER NARMAD SOUTH GUJARAT UNIVERSITY**

**Master of Computer Application  
Semester - I  
Effective From : July - 2009**

**PAPER NO. : 101**

**Paper Title : COMPUTER ORGANIZATION & FUNDAMENTALS OF  
OPERATING SYSTEMS**

- 1. Memory , Number System & Basic Computer Architecture**
  - 1.1 RAM, ROM, PROM, EPROM etc, Virtual Memory, Cache Memory
  - 1.2 Secondary Storage Devices
  - 1.3 Binary, Hexadecimal, Octal Number System
  - 1.4 Integer & Floating Point representation
  - 1.5 Block Diagram of CPU and execution process.
  - 1.6 Introduction to bus architecture
  - 1.7 H/W parts of PC
  - 1.8 I/O devices : keyboard, display, pointing devices, modem, scanners, ocr, cd-rom, dvd, printers.
- 2. Operating System Concepts**
  - 2.1 Evolution of Operating System & History
  - 2.2 Needs of an Operating System
  - 2.3 Single User & Multi-User Operating System
  - 2.4 Elements of an Operating System
- 3. Single User Operating System**
  - 3.1 BIOS, POST Operation, Vector Table, Device Drivers, TSR Programs
  - 3.2 System Files
  - 3.3 Configuration Files
  - 3.4 Disk Architecture
  - 3.5 Commands
  - 3.6 Introduction to Windows
- 4. Multiuser Operating System**
  - 4.1 Introduction to Windows-NT, UNIX/LINUX
  - 4.2 LAN Fundamentals
  - 4.3 Basic Commands of NETWARE, Windows-NT, Unix/LINUX
- 5.[ Self Study]**  
Comparison of two multi – user o.s.

Reference Books :

1. Fundamentals of Computer – V. RajaRaman
2. How Computers work - Ron White – Techmedia
3. Introduction to computers :- Peter Norton – TMH
4. Understanding Operating Systems - 4th Ed- Flynn – Thomson Course Technology
5. Inside IBM PC - Peter Norton - PHI
6. Unix Concepts And Application - Das – McGrawHill
7. MS DOS 6.22 – Comdex Computer Publishing
8. Netware for dummies - Dummy Series
9. Advanced MSDOS - Ray Duncon - McGraw Hill
10. Advanced Unix -A Programmer's Guide - Stephen Prata - SAMS
11. User Manual of DOS, Windows-Windows-NT, Netware
12. Operating Systems - Stallings – PHI

**Note : 5% weight may be given to self study topic in the final exams**

**VEER NARMAD SOUTH GUJARAT UNIVERSITY****Master of Computer Application  
Semester – I  
Effective From : July - 2009****PAPER NO. : 102****Paper Title : Database Management System**

- 1. Basic Concepts of Database Management System.**
  - 1.1 Fundamental concepts of File and databases
  - 1.2 Purpose of database system
  - 1.3 Introduction to Data models
    - 1.3.1 Conceptual Data model – E- R model
    - 1.3.2 Record – base Data models – Hierarchical. Relation , Network
- 2. Features of Database Systems**
  - 2.1 Data abstraction & Data independence
  - 2.2 Type of Database Languages : DDL, DML, TCL
  - 2.3 Database users : Database manager, administrator and Users
  - 2.4 Overall system structure.
- 3. Structure of relational database model**
  - 3.1 Relation scheme , Relation instant, Viws
  - 3.2 Notion of Keys
  - 3.3 Pure query language : relational algebra
- 4. Relational Commercial Language - SQL**
- 5. Commercial RDBMS : Microsoft Access/DB2**
  - 5.1 Basic Architecture as DBMS
  - 5.2 Working with databases and tables.
  - 5.3 Managing constrains and relationships.
  - 5.4 Using SQL queries.
  - 5.5 Introduction to other object : Forms , Reports, Macros, etc.
- 6. Integrity Constrains**
  - 6.1 Domain Constrains , key Constrains, Referential Integrity Constrains
  - 6.2 Functional Dependencies
- 7. Relational Database Design**
  - 7.1 Pitfalls in relational database design
  - 7.2 Normalization using Functional Dependencies
  - 7.3 Normalization using Multi valued Dependencies
  - 7.4 Normalization using Join Dependencies
  - 7.5 Domain – Key normal form
- 8. [Self Study]**

Security features provided by access/DB2

**Reference Books**

1. Database System Concepts – SILBERSCHATZ , KORTH, SUDARSHAN- McGraw- Hill
2. An introduction to Database Systems- C.J.DATE – Addison Wesley
3. Database System : A practical approach to design implementation and management – THOMAS CONNOLLY , CAROLYN BEGG, Pearson Education
4. Access - The Complete Reference – Virginia Andersen – McGraw - Hill
5. Access Database Design & Programming – Steven Roman - O' Reilly
6. Microsoft Access : Bible – Cary N. Prague

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY**

**Master of Computer Application  
Semester – I  
Effective From : July – 2009**

**Paper No. : 103**

**Paper Title : Computer Programming & Programming Methodology**

- 1. Algorithm & Flowcharting**
- 2. Programming Languages & Structured Programming**
  - 2.1 Structured Programming**
  - 2.2 Levels of Programming languages**
  - 2.3 Compiler/Interpreter**
- 3. Program Bugs & Testing**
  - 3.1 Program Bugs**
  - 3.2 Preparing Test data**
  - 3.3 Functional & Structural Testing**
- 4. Constants & Variables**
  - 4.1 Character Set**
  - 4.2 Constants - needs & definition**
  - 4.3 Variables - needs & definition**
  - 4.4 Storage Class**
  - 4.5 Scope of Variables**
- 5. Expressions & Operations**
  - 5.1 Operators : Assignment, Arithmetic, Increment, Decrement, Relational, Logical, Bitwise, Conditional**
  - 5.2 Expression**
  - 5.3 Evaluation & Assignment of Expression**
  - 5.4 Elementary built-in functions.**
- 6. Input & Output Functions**
- 7. Jumping, Branching & Looping Statements**
- 8. String Built-in functions**
- 9. Array**
- 10. Structure Union & Enumerated data types**
- 11. User Defined Functions**
  - 11.1 Call by value**
  - 11.2 Passing Structures & Array**
  - 11.3 Recursion**

**12. Pointer's****12.1 Basics of Pointers****12.2 Pointer Arithmetic****12.3 Pointer array****12.4 Call by reference in User Defined Functions****12.5 Pointer of function****13 [Self Study]****Multi – Dimensional arrays using pointers****Reference Books:**

1. C Language Programming - Byron Gottfried - TMH
2. Pointers in C – Yashwant Kanitkar
3. Programming ANSI C – E Balagurusamy –
4. Let US 'C' – Yashwant Kanitkar
5. C Programming Language - Karnighan & Ritchie – TMH
6. 'C' Odyssey (6 Volumes) - Vijay Mukhi - PHI
7. The Complete Reference - C - Herbert Schildt, Tata Mc Graw Hill
8. Structured programming concepts - La Budde - (Mc.Graw Hill)
9. Programming in 'C' - Stephan Kochan - CBS
10. Mastering Turbo C - Kelly & Bootle – BPB
11. Mastering Turbo C - Stan Kelly - BPB

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY**

**Master of Computer Application  
Semester - I  
Effective From : July – 2009**

**Paper - 104 - Accounting and Financial Management**

- 1. Accounting :**
  - 1.1 Principles, concepts and conventions**
  - 1.2 Double entry system of accounting, ledger & preparation of Trial balance**
  - 1.3 Subsidiary Books**
  
- 2. Final Accounts :**
  - 2.1 Trading, profit and loss accounts**
  - 2.2 Balance sheet of sole proprietary concern with normal closing entries.**
  - 2.3 Introduction to manufacturing account.**
  - 2.4 Limited company - Schedule VI**
  - 2.5 Accounts of Non-profit organization**
  
- 3. FINANCIAL MANAGEMENT :**
  - 3.1 Meaning and role.**
  - 3.2 Working Capital Requirements**
  - 3.3 Capital Budgeting**
  - 3.4 Source of Finance**
  
- 4. RATIO ANALYSIS :**
  - 4.1 Meaning**
  - 4.2 Advantages**
  - 4.3 Limitations**
  - 4.4 Types of ratios and their usefulness.**
  
- 5. FUND FLOW STATEMENT :**
  - 5.1 Meaning of the terms - fund, flow and fund, working capital cycle**
  - 5.2 Preparation and interpretation of the fund flow statement.**
  
- 6. COSTING :**
  - 6.1 Nature, importance, basic principles and Cost sheet**
  
- 7. [Self Study]**

**Introduction to computerised accounting system :**

  - 7.1 Coding**
  - 7.2 Logic and codes required**
  - 7.3 Master files, transaction files**
  - 7.4 Introduction to documents used for data collection**
  - 7.5 Processing of different files and output obtained.**

**REFERENCE BOOKS :**

- (1) Kellock, J. : Elements of Accounting, Heinemann, 1978.
- (2) Van Home, James, C. : Financial Management & Policy, prentice Inc.
- (3) R.L.Gupta : Advanced Accountancy
- (4) Shukla & Grewal : Advanced Accounts
- (5) S.N.Maheshwari : Management Accounting and Financial Control
- (6) S.N.Maheshwari : Problems & Solutions in Management Accounting & Financial Management
- (7) A. Raman : Advanced Accountancy, Himalya Pub. House
- (8) Mukharji Hanif : Modern Accountancy, Vol. I and II, THM Pub.
- (9) S. M. Maheshwari : Cost and Management Accounting, Sultan Chand & Sons Pub.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY**

**M.C.A. Semester - I**

**Effective From : July - 2009**

**Paper No. : 105**

**Paper Title : Mathematical Foundation Of Computer Science**

**1. Statistics**

- 1.1 Concepts of Random Variable**
- 1.2 Probability & Probability Distribution**
- 1.3 Mean & Variance of Probability Distribution**
- 1.4 Statistical data**
- 1.5 Frequency Distributions**
- 1.6 Mean, Variance & Standard Deviation of Data**
- 1.7 Bivariate data**
- 1.8 Concept of Dependent & Independent Variable**
- 1.9 Correlation**
- 1.10 Linear Regression**

**2. Linear Algebra**

- 2.1 Matrices**
- 2.2 Elementary matrix operations**
- 2.3 Determinants**
- 2.4 Rank of matrix**
- 2.5 Adjoin & Inverse of a matrix**
- 2.6 Matrix representation of simultaneous linear equation**
- 2.7 Solution of simultaneous linear equations using Cramer's Rule**

**3. Graph Theory**

- 3.1 Definition & Representation of graphs**
- 3.2 Properties of general Graphs**
- 3.3 Matrix representation of Graphs**
- 3.4 Trees and their properties.**

**4. [Self Study]**

**Problem solving using Excel/SPSS**

**Reference Books:**

- 1. Introduction to Mathematical Statistics - Hogg R V & Craig A L  
- Tata Mc-Graw Hill**
- 2. An Introduction to the Theory of Statistics - Yule U G &  
Kendall M G - Chailes Griffin & Co.**
- 3. Fundamental of Mathematical Statistics - Kapoor & Gupta - S  
Chand & Co.**
- 4. Matrix and Linear Algebra - K B Datta - PHI**
- 5. Linear Algebra - A R Rao & P Bhimashankaram - Tata McGraw Hill**
- 6. Graph Theory - Harry F - Addison Wesley Publication**
- 7. Discrete Mathematical Structures with Applications to Computer  
Science - Trembley J P & Manohar R P - McGraw Hill**

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY**

**M.C.A. Semester – I**  
**Effective From: July - 2009**

**Paper No. : 106**

**Paper Title : Practical (Based on Paper No. 102 to 103)**

**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**

**Master of Computer Application  
Semester -II  
Effective From : July - 2009**

**PAPER NO. : 201**

**Paper Title : Advanced 'C' Programming & System Software**

**1. Files**

- 2.1 Reading & Writing from a file
- 2.2 Reading & writing structures
- 2.3 Random accessing a file

**2. Preprocessor**

- 2.1 # and ## operator
- 2.2 Preprocessor statements
- 2.3 Macro definitions

**3. Graphics**

- 3.1 Graphics modes, Co-ordinates & attributes
- 3.2 Drawing objects
- 3.3 Animation

**4. Low Level Programming**

- 4.1 Register Variables
- 4.2 Bitwise Operations
- 4.3 Bit Fields

**5. Introduction to System S/W & Components**

**6. Assemblers**

- 6.1 Design Procedure
- 6.2 Single pass & Two pass Assembler

**7. Compilers**

- 7.1 Aspects & Overview of Compilation Process
- 7.2 Storage Allocation
- 7.3 Code Generation
- 7.4 Phases of Compiler

**8. Linker & Loaders**

- 8.1 Loader Scheme
- 8.2 Linking & relocation

**9. [ Self Study]**

- TSR Programming

## Reference Books :

1. C Programming Language - Kernighan & Ritchie - TMH
2. Pointers in 'C' – Yashwant Kanitkar
3. 'C' Odyssey (6 Volumes) - Vijay Mukhi - PHI
4. Programming in 'C' - Stephan Kochan - CBS
5. Mastering Turbo C - Kelly & Bootle - BPB
6. C Language Programming - Byron Gottfried - TMH
7. Mastering Turbo C - Stan Kelly - BPB
8. System programming & operating System - Dhamdhere - THM
9. Compilers Principales Techniques & Tools - Aho A - Addison Wesley

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**

**Master of Computer Application  
Semester -II**

**Effective From : July - 2009**

**Paper No. : 202  
Paper Title : Data Structures**

- 1. Non-Primitive Data structures.**
  - 1.1 Arrays - its storage structures & operations**
  - 1.2 Stacks - operations and its applications in Recursion, Polish expressions etc.**
  - 1.3 Queues - Types of queues, operations and its applications.**
  - 1.4 Linked lists - Types of linked list, operations and its applications.**
  - 1.5 Trees - Concept and Definitions, Operations, linked & threaded storage representation of Binary Trees.**
  - 1.6 Applications of Trees - The manipulation of Arithmetic expressions, Symbol-table construction, Syntax Analysis etc.**
- 2. Analysis of Algorithms**
  - 2.1 Asymptotic : Big-O and Theta**
- 3. Basic techniques & example algorithms for**
  - 3.1 Divide & Conquer method**
  - 3.2 Greedy method**
  - 3.3 Backtracking**
  - 3.4 Branch & Bound**
- 4. Searching:**
  - 4.1 Sequential, Binary**
  - 4.2 Search Trees :- Height, Balanced tree, 2-3, tree, red-black trees weight-balanced trees**
- 5. Hashing**
  - 5.1 Hash Tables**
  - 5.2 Hash functions**
    - 5.2.1 Division method**
    - 5.2.2 Multiplication method**
- 6. Sorting**
  - 6.1 Internal sorting - Insertion, Selection, Quick, 2-way merge and Heap**
  - 6.2 External sorting - k-way merging, Balanced merge and poly phase merge**

## **7. [Self Study] Graphs – Creation and Traversal**

### **Reference Books :**

1. An Introduction to Data Structures with applications - Trembley - McGraw Hill
2. Theory and Problems of Data Structure – Lipschutz Semour – McGraw-Hill
3. Algorithms + Data Structure Programs - Wirth, Niclaus - PHI.
4. Fundamentals of Data Structures, Horwitz, E. and Sahni S. - Computer Science Press.
5. The Art of Computer Programming, Vols. 1-2, Knuth D. - Addison-Wesley.
6. Data Structures and Algorithms - Aho A.V., Hopcroft and Ullman - Addison-Wesley.
7. Data Structure & "C" Programming - Vanwyte C J - Addison Wesley.
8. Data Structures, Algorithms And Object Oriented Programming – Tata McGraw Hill edition  
Geogory L. Heileman.
9. Data Structures and the Standard Template Library - William J. Collins, Tata McGraw Hill  
edition.
10. Programming with C++ and Data Structures - Maria Litvin & Gary Litvin, Vikas Publishing  
House Pvt. Ltd.
11. Data Structures using C & C++ - Y. Langsam Moshe J. Angensterin & A.M. Terenbanm
12. Data Structures and Algorithms in C++ - Adam Drozdek, Thomson Learning
13. Data Structures & Program Design in C - Robert Kruse, C.L. Tondo, Brnce leing  
PHI Pvt Ltd.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**

**Master of Computer Application  
Semester - II  
Effective From : July - 2009**

**PAPER NO. : 203**

**Paper Title : RELATIONAL DATA BASE MANAGEMENT SYSTEM**

- 1. Storage and File Structure.**
  - 1.1 Overview of Physical Storage Media**
  - 1.2 Magnetic Disks**
  - 1.3 RAID**
  - 1.4 File Organization**
  - 1.5 Organization of records in File**
  - 1.6 Data – Dictionary**
  
- 2. Indexing and Hashing**
  - 2.1 Ordered Indices**
  - 2.2 B<sup>+</sup> Tree Index Files**
  - 2.3 B- Tree Index Files**
  - 2.4 Static Hashing**
  - 2.5 Dynamic Hashing**
  - 2.6 Comparison of Ordered Indexing and Hashing**
  - 2.7 Index Definition in SQL**
  - 2.8 Multiple – Key Access**
  
- 3. Database System Architectures**
  - 3.1 Centralized Systems**
  - 3.2 Client – Server Systems**
  - 3.3 parallel System**
  - 3.4 Distributed Systems**
  - 3.5 Network Types**
  
- 4. Crash Recovery**
  - 4.1 Failure classification**
  - 4.2 The storage hierarchy**
  - 4.3 Transaction model**
  - 4.4 Log-based recovery**
  - 4.5 Buffer management**
  - 4.6 Checkpoints**
  - 4.7 Shadow Paging**
  
- 5. Security And Integrity**
  - 5.1 Security and integrity violations**
  - 5.2 Authorization and views**
  - 5.3 Security specification in SQL**
  - 5.4 Encryption**

6. Query Processing
  - 6.1 Query interpretation
  - 6.2 Equivalence of expressions
  - 6.3 Estimation of Query-processing cost
  - 6.4 Join Strategies
  - 6.5 Structure of the query optimizer
7. Concurrency Control
  - 7.1 Schedules
  - 7.2 Testing for serializability
  - 7.3 Lock-based protocols
  - 7.4 Timestamp-based protocols
  - 7.5 Validation techniques
8. Parallel Databases
  - 8.1 I/O Parallelism
  - 8.2 Interquery Parallelism
  - 8.3 Interoperation Parallelism
  - 8.4 Design of Parallel system
9. Distributed Databases
  - 9.1 Distributed Data Storage
  - 9.2 Network Transparency
  - 9.3 Distributed Query Processing
  - 9.4 Distributed Transaction Model
  - 9.5 Commit Protocols
  - 9.6 Concurrency Control
  - 9.7 Deadlock Handling
  - 9.8 Multi database System
10. [ Self Study ]

A case study on Distributed Database System Architecture.

**Reference Books :**

1. Database System Concepts - Henry F. Korth & Abraham Silberschatz - TMH
2. Principles of Database Systems - Jeffery Ullman - Galgotia Publication
3. An introduction to Database Systems - C.J.Date - Addison- Wesley
4. Introduction to Database Management - Navin Prakash – TMH
5. Introduction to Database System - Bipin C. Desai – Galgotia
6. Manual of RDBMS.

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**

**Master of Computer Application  
Semester -II  
Effective From : July - 2009**

**Paper Title : Optimization Techniques**

- 1. Linear Programming**
  - 1.1 Formulation of L.P.P.**
  - 1.2 Solution Methods**
    - 1.2.1 Graphical Method**
    - 1.2.2 Simplex Method**
    - 1.2.3 Two Phase Method**
    - 1.2.4 Big-M Method**
- 2. Special cases of L.P.P.**
  - 2.1 Transportation Problem**
  - 2.2 Assignment Problem**
- 3. Job Sequencing**
  - 3.1 Processing n jobs through 2 machines**
  - 3.2 Processing n jobs through 3 machines**
  - 3.3 Processing 2 jobs through m machines**
  - 3.4 Processing n jobs through m machines**
- 4. Inventory Problem**
  - 4.1 Introduction to Inventory**
  - 4.2 Deterministic Inventory models**
  - 4.3 Dynamic Inventory models**
- 5. Network Analysis**
  - 5.1 PERT**
  - 5.2 CPM**
- 6. Self Study**
  - Practical of PERT CPM**

### **Reference Books :**

1. Hiller F.S. & Liberman G.J. : Introduction to Operations Research 2nd Edn. :- Holand Day Inc. London, 1974
2. Tara H.A. : Operation Research, 3rd Edn.- McMillan Publishing Company, 1982
3. Beightler C.S. & Phillips D.T. : Foundations of Optimization,- Prentice Hall, 1979
4. McMillan Claude Jr. : Mathematical Programming, 2nd Edn.- Wiley Series, 1979
5. Gillett B.G. : Introduction to Operation Research - A Computer oriented Algorithmic approach- McGraw Hill Book Comp., 1976
6. N.S. Kambo : Mathematical Programming Techniques

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**

**Master of Computer Application**

**Semester -II**

**Effective From: July - 2009**

**Paper No. : 205**

**Paper Title : Computer Net Works**

**1 Introduction**

**1.1 Introduction to networks, Internet and its application**

**1.2 Network Structure**

**1.3 Network Architecture**

**1.4 The OSI Reference model & services**

**1.5 The TCP/IP Reference model and Comparison with OSI Model**

**2 Physical Layer**

**2.1 Concepts of data transmission**

**2.1.1 Guided and unguided Transmission media . PSTN**

**2.2 Multiplexing & Switching technique**

**2.3 ISDN ( Integrated Service Digital Network )**

**3 MAC Sublayer**

**3.1 Multiple Access Protocols**

**3.2 Ethernet**

**3.3 LAN protocols & IEEE standards for LAN**

**3.4 Fibre Optic & Satellite networks**

**4 Data Link Layer**

**4.1 Data Link Layer protocols**

**4.2 Error detection & correction**

**5 Network Layer**

**5.1 Routing Algorithm**

**5.2 Congestion Control Algorithm**

**5.3 Internetworking**

**6 Transport Layer**

**6.1 Connection Management**

**7 Concepts of Session Layer**

**8 The Presentation Layer**

**8.1 Data Compression Technique**

**8.2 Cryptography**

**8.3 Symmetric Key Algorithms**

**8.4 Public – Key Algorithms & management of Public Keys**

**8.5 Digital Signatures and Communications security**

## **9 The Application Layer**

### **9.1 Electronic Mail**

### **9.2 Virtual Terminals**

### **9.3 General Purpose Applications**

## **10 [ Self Study ]**

### **Virtual Lan**

### **Reference Books :**

1. Networking Complete- 1<sup>st</sup> Edition 2002, BPB Publication (Text Book)
2. Data Communication and Networking : Forouzan, TMH
3. Computer Networks - A. S. Tanenbaum - Prentice-Hall
4. Computer Networks and Distributed Processing - Martin J. - Prentice-Hall
5. Local Area Networks: An Introduction - Stalling, William - Mc-Millan Publishing Co.
6. Computer Networks: Protocols, Standards and Interfaces - Black - Prentice-Hall
7. Data Networks : Concepts Theory and Practices - Black - PHI
8. N/W Architecture - Comer - Prentice-Hall

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**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**

**Master of Computer Application.  
Semester - II**

**Effective From : July - 2009**

**Paper No. : 206**

**Paper Title : Practical based on papers 201,202**