VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.C.A.
Semester - II
Effective From : July - 2006

PAPER NO. : 201
Paper Title : Advanced 'C' Programming & System Softwares

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

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

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.C.A.
Semester - II

Effective From : August - 2006

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 T heta**

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

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

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.C.A.
Semester - II
Effective From : July - 2006

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^+ 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. **Secirity 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 Strtegies**
- **6.5 Sturcture 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. **Databse System Concepts - Henry F. Korth & Abraham Silberschatz - TMH**
2. **Priciples 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.**

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

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.C.A.
Semester - II
Effective from : August - 2006

Paper No. : 204

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**
   - Goal Programming

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
- McGrow Hill Book Comp., 1976
6. N.S. Kambo : Mathematical Programming Techniques
- **East-West Press, New Delhi, 1991**

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

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.C.A.
Semester - II

Effective From : July - 2006

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 Architacture
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 Acess Protocols
3.2 Ethernet
3.3 LAN protocols & IEEE standards for LAN
3.4 Fibre Optic & Satelite 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 Cryptogrphy
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. **Computer Networks - A. S. Tanenbaum - Prentice-Hall**
2. **Computer Networks and Distributed Processing - Martin J. - Pretice-Hall**
3. **Local Area Networks:An Introduction - Stalling, William - Mc-Millan Publishing Co.**
4. **Computer Networks: Protocols, Standards and Interfaces - Black - Prentice-Hall**
5. **Data Networks : Concepts Theory and Practices - Black - PHI**
6. **N/W Architecture - Comer - Prentice-Hall**
7. **Data Communication : Forouzan, TMH**

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

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

M.C.A.
Semester - II

Effective From : July - 2006

Paper No. : 206

Paper Title : Practical (Based on Paper No. 201 to 205)