



**MCA - MASTER OF COMPUTER APPLICATIONS
 (THREE YEAR FULL TIME)
 CURRICULUM 2007
 SEMESTER I**

Code No.	Course Title	L	T	P	C
Theory					
YCA101	Mathematical Foundations of Computer Science	3	1	0	4
YCA102	Computer Organization	3	0	0	3
YCA103	Problem Solving and Programming in C	3	1	0	4
YCA104	Business Process Re-engineering and Organization Behaviors	3	0	0	3
YCA105	Accounting and Financial Management	3	1	0	4
Practical					
YCA106	Programming Lab	0	0	4	2
YCA107	Web design and package lab	0	0	4	2

Total Hours -26

Total Credits -22

SEMESTER II

Code No.	Course Title	L	T	P	C
Theory					
YCA201	Computer Networks	3	1	0	4
YCA202	Operating Systems	3	1	0	4
YCA203	Database Management Systems	3	1	0	4
YCA204	Object Oriented Programming in C++	3	0	0	3
YCA205	Data Structures	3	1	0	4
Practical					
YCA206	Programming in C++ & DBMS Lab	0	0	4	2
YCA207	Data Structures Lab	0	0	4	2

Total Hours -27

Total Credits -23

SEMESTER III

Code No.	Course Title	L	T	P	C
Theory					
YCA301	Design and Analysis of Algorithms	3	1	0	4
YCA302	Advanced Java Programming	3	1	0	4
YCA303	Software Engineering	3	0	0	3
YCA304	Computer Graphics and Multimedia	3	0	0	3
YCA305	Microprocessor and its Applications	3	1	0	4
Practical					
YCA306	Advanced Java Programming Lab	0	0	4	2
YCA307	Graphics and Multimedia Lab	0	0	4	2

Total Hours -26

Total Credits -22

SEMESTER IV

Code No.	Course Title	L	T	P	C
Theory					
YCA401	Object Oriented Analysis and Design	3	1	0	4
YCA402	Unix and Network Programming	3	1	0	4
YCA403	Visual Programming	3	1	0	4
YCA404	Social Engineering	3	0	0	3
YCAE**	Elective – I	3	0	0	3
Practical					
YCA406	Unix Lab	0	0	4	2
YCA407	Visual Programming Lab	0	0	4	2

Total Hours -26

Total Credits -22

SEMESTER V

Code No.	Course Title	L	T	P	C
Theory					
YCA501	XML and Web Services	3	1	0	4
YCA502	Software Project Management Practice	3	1	0	4
YCA503	Entrepreneurial Development Management	3	0	0	3
YCAE**	Elective II	3	0	0	3
YCAE**	Elective III	3	0	0	3
Practical					
YCA506	XML Web Services and Open source	0	0	4	2
YCA507	Software design and development Lab	0	0	4	2

Total Hours -25

Total Credits -21

SEMESTER VI

Code No.	Course Title	L	T	P	C
Theory					
YCA601	Project Work	0	0	26	13

Total Hours -26

Total Credits -13

Total Credits - 123

LIST OF ELECTIVES

Code No.	Course Title	L	T	P	C
YCAE51	Resource Management Techniques	3	0	0	3
YCAE52	Management Information Systems	3	0	0	3
YCAE53	Human Resources Management	3	0	0	3
YCAE54	Enterprise Resource Planning	3	0	0	3
YCAE55	Mobile Computing	3	0	0	3
YCAE56	Cryptography	3	0	0	3
YCAE57	Internet Protocols	3	0	0	3
YCAE58	Image Processing and computer Vision	3	0	0	3
YCAE59	Parallel & distributed computing	3	0	0	3
YCAE60	Numerical methods and Statistics	3	0	0	3
YCAE61	Data Warehousing and Data Mining	3	0	0	3
YCAE62	Neural and Fuzzy Logic Applications	3	0	0	3
YCAE63	Total Quality Management	3	0	0	3
YCAE64	Information System Security	3	0	0	3
YCAE65	Software Testing	3	0	0	3
YCAE66	Software Ethics	3	0	0	3
YCAE67	e-Business	3	0	0	3
YCAE68	Outsourcing	3	0	0	3
YCAE69	Soft Computing	3	0	0	3

SYLLABUS

YCA101 - MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

3 1 0 4

1. MATHEMATICAL LOGIC

12

Statements and notations, Connectives, truth tables, Normal forms(CNF,DNF,PCNF and PDNF), Inference for the statement calculus, Predicate Calculus, Inference theory of the predicate calculus

2. SET THEORY

12

Basic definitions, Venn diagrams, set operations, laws of set theory, Relations and ordering-relations, properties of binary relations on a set, equivalence relations, composition of binary relations, Functions- definition and introduction, composition of functions, inverse functions

3. GRAPH THEORY AND TREES

12

Basic concepts of Graph theory, paths, reachability and connectedness, matrix representation of graphs, Trees, storage representation and manipulation of graphs

4. AUTOMATA THEORY AND FORMAL LANGUAGES

12

Definition of automaton, finite automaton, transition systems, properties of transition functions, non-deterministic finite state machines, equivalence of DFA and NDFA, minimization of finite automata, basic definitions of formal languages, Chomsky classification of languages

5. REGULAR SETS AND REGULAR GRAMMARS, CONTEXT-FREE LANGUAGES

12

Context-free languages and derivation trees, Ambiguity in CFG, simplification of CFG, Normal form of CFG, Pumping lemma of CFG, Pushdown Automata – basic definitions, acceptance by PDA, pushdown automata and CFL, parsing and pushdown automata

L:45; T:15; Total: 60

TEXT BOOKS:

1. J.P. Tremblay, R. Manohar, “ Discrete Mathematical Structures with Applications to Computer Science”, Tata McGraw-Hill Publishing Company Limited, New Delhi
1. K.L.P. Misra , N.Chandrasekaran, “Theory of Computer Science (Automata, Languages and Computation)” Prentice Hall of India Private Limited, New Delhi, Second Edition

YCA102 - COMPUTER ORGANIZATION

3 0 0 3

1. INTRODUCTION TO DIGITAL DESIGN

9

Data Representation – Data Types – Complements – Arithmetic Operations – Representations – Fixed –Point, Floating – Point , Decimal Fixed – Point – Binary Codes- Logic Gates, Boolean Algebra, Map Simplification – Combinational Circuits: Half-Adder, Full Adder- Flip Flops - Sequential Circuits

2 DIGITAL. COMPONENTS - REGISTER TRANSFER & MICRO OPERATIONS

9

ICs – Decoders – Multiplexers – Registers – Shift Registers – Binary Counters – Memory Unit – Register Transfer Language – Register Transfer – Bus and Memory Transfers – Arithmetic, Logic and Shift Micro Operations , Arithmetic Logic Shift Unit.

3. COMPUTER ORGANIZATION AND PROGRAMMING

9

Instruction Codes – Computer Registers – Computer Instructions – Timing And Control – Instruction Cycle – Memory Reference Instructions – I/O and Interrupt – Machine Language – Assembly Language – Assembler - Program Loops – Programming Arithmetic and Logic Operations – Subroutines – I/O Programming.

4. INPUT – OUTPUT ORGANIZATION

9

Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer – Modes Of Transfer – Priority Interrupt – DMA – IOP – Serial Communication.

5. MEMORY ORGANIZATION AND CPU

9

Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management Hardware – CPU: General Register Organization – Control Word – Stack Organization – Instruction Format – Addressing Modes – Data Transfer And Manipulation – Program Control.

L:45; Total: 45

TEXTBOOK:

1. M.Morris Mano,"Computer System Architecture",Prentice Hall of India, 2001

REFERENCES:

1. John .P.Hayes,"Computer Architecture and Organization", Tata McGraw Hill, 1996
2. V.C.Hamatcher,et al "Computer Organization", Tata Mcgraw Hill,1996

YCA104 - BUSINESS PROCESS RE-ENGINEERING AND ORGANIZATION BEHAVIOURS

3 0 0 3

1. ORGANIZATIONAL STRUCTURE 9

Outcomes of Organizations – Nature and Types of Business Organizations - Organizational Structures-Definition-Complexity-Formulization-Size-Technology-Culture-Forms and Outcomes-Explanations of Structures-IT Industry and Organizational Structures-Case Studies

2. ORGANIZATIONAL OUTCOMES 9

Organizational Power and Power Outcomes-Leadership and Decision Making-Communication and Organizational Change-Organizational Environments and effects-Inter and Intra organizational Relationships-Organizational Effectiveness-Case Studies

3. BUSINESS PROCESS RE-ENGINEERING 9

Introduction to Business Process Re-engineering (BPR)- Re-engineering and the organizations of tomorrow- Toward a Definition of Corporate Transformation - Principles and methods of BPR – Re-engineering Work - A Methodology for Re-engineering Businesses Strategic aspects of BPR- Business Re-engineering - Process Re-engineering -Case Studies

4. BPR AND INFORMATION SYSTEM 9

BPR and Total Quality Management - Questing for the Best - Making Total Quality Work - BPR and Information Systems - Redesigning the Organization Through Information Technology - IT-Enabled Business Transformation: From Automation to Business Scope Redefinition - The Most Fatal Re-engineering mistakes - Case Studies

5. E-BUSINESS PROCESS 9

E-Business-Introduction-E-business vs. E-commerce-Execution of E-business-Trends-Design for Execution-Construction - Organizational Frame Work and Implementation-E-business Application Areas(CRM,ERP,SCM and Selling)-E-business and India-Case Studies

L:45; Total: 45

TEXTBOOK:

1. Richard H.Hall, "Organizations-Structures, Processes and Outcomes", Pearson Education, 2004
2. Vikram Sethi , William King , "Organizational Transformation Through Business Process Reengineering: Applying Lessons Learned ",Prentice Hall, 1998
3. Ravi Kalakota and Marcia Robinson, "E-Business; Roadmap for Success; Pearson Education, 2000

REFERNCES:

1. Gareth Jones, "Organizational Theory, Design and Change", Pearson Education, 4th Edition, 2004
2. Dave Chaffey, "E-business and E-Commerce" Pearson Education, 2nd Edition,2003

YCA105 - ACCOUNTING AND FINANCIAL MANAGEMENT 3 1 0 4

I. FINANCIAL ACCOUNTING 12

Meaning and Scope of Accounting-Principles-Concepts-Conventions-Accounting Standards-Final Accounts-Trail Balance-Trading Account-Profit and Loss Account-Balance Sheet-Accounting Ratio Analysis-Funds Flow Analysis-Cash Flow Analysis

2. ACCOUNTING 12

Meaning-Objectives-Elements of Cost-Cost Sheet-Marginal Costing and Cost Volume Profit Analysis-Break Even Analysis-Applications-Limitations-Standard Costing and Variance Analysis-Material-Labor-Overhead-Sales-Profit Variances

3. BUDGETS AND BUDGETING CONTROL 12

Budgets and Budgetary Control-Meaning-Types-Sales Budget-Production Budget-Cost of Production Budget-Flexible Budgeting-Cash Budget-Master Budget-Zero Base Budgeting-Computerized Accounting

4. INVESTMENT DECISION AND COST OF CAPITAL 12

Objectives and Functions of Financial Management-Risk-Return Relationship-Time Value of Money Concepts-Capital Budgeting-Methods of Appraisal-Cost of Capital Factors Affecting Cost of Capital-Computation for Each Source of Finance and Weighted Average Cost of Capital

5. FINANCING DECISION AND WORKING CAPITAL MANAGEMENT 12

Capital Structure-Factors Affecting Capital Structure-Dividend Policy-Types of Dividend Policy-Concepts of Working Capital-Working Capital Policies-Factors affecting Working Capital-Estimation of Working Capital Requirements

L:45; T-15;TOTAL:60

TEXTBOOK:

1. S.N.Maheswari, "Financial and Management Accounting", Sultan Chand & Sons, 2003
2. I.M.Pandey, "Financial Management", Vikas Publications, 4th Reprint, 2002

REFERENCES:

1. S.P.Iyengar, "Cost and Management Accounting", Sultan Chand & Co,
2. I.M.Pandey, "Elements of Management Accounting" Vikas Publishing House, 19993

YCA106 - PROGRAMMING LAB

0 0 4 2

1. Display the following:
 - (i) Floyd's triangle (ii) Pascal Triangle
2. Generate the following series of numbers:
 - i. Armstrong numbers between 1 to 100
 - ii. Prime numbers between 1 to 50
 - iii. Fibonacci series up to N numbers
3. Manipulate the strings with following operations.
 - (i) Concatenating two strings (ii) Reversing the string (iii) Finding the sub-string
 - (iv) Replacing a string (v) Finding length of the string
4. Find the summation of the following series:
 - (i) Sine (ii) Cosine (iii) Exponential
5. Create the sales report for M sales person and N products using two dimensional array.
6. Simulate following Banking operations using functions.
 - (i) Deposit (ii) Withdrawal (iii) Balance Enquiry
7. Implement using recursion
 - i. Find the solution of Towers of Hanoi problem using recursion.
 - ii. Fibonacci number generation.
 - iii. Factorial
8. Generate Student mark sheets using structures.
9. Create a collection of books using arrays of structures and do the following:
 - (i) Search a book with title and author name (ii) Sorts the books on title.

P:60; Total:60

1. Design a web page using Formatted tags (Text, Font, Heading, Paragraph) and Using structure tags (Definition, Ordered and unordered lists).
2. Write a HTML code to create a Web page using style tags (Images, Colors, Anchors and Lines).
3. Create a web page using linking tags(linking to other areas of the same page, linking to other www pages, using images to link to other areas of the page).
4. Design a HTML page using Frames and Multimedia tags.
5. Create a web application using Form, Tables and Multimedia tags.
6. Write a DHTML code to create a dynamic web page.
7. Write a program using java script event handlers.
8. (i) Create a document for mail merge.
(ii) Design an advertisement sheet using Ms-Word.
9. (i) Prepare a mark sheet for Internal and II internal test for MCA students and draw a graph and compare the results
(ii) Prepare Electricity Bill for various tariff
10. Develop a demo with at least 10 slides for taking lecturer on pointers in C

P:60; Total: 60

1. INTRODUCTION 12

Network Models - OSI Model - TCP/IP Protocol Suite - Addressing - Transmission Media - Error Detection and Correction - Block Coding.

2. NETWORK FUNDAMENTALS 12

LAN Technology- LAN Architecture - BUS/Tree - Ring – Star - Ethernet- Token Rings - Wireless - Data Link Control - Framing - Flow and Error Control.

3. NETWORK LAYER 12

Switching - Circuit, Message, Packet - Network Layer - IPV4, IPV6 Addresses - Internetworking- Format - IPV4, IPV6 - ICMP - IGMP - Delivery, Forwarding, Routing.

4. TRANSPORT LAYER 12

End-to-End Delivery - User Datagram Protocol (UDP) – TCP - Congestion Control - TCP, Frame Relay.

5. PRESENTATION LAYER and APPLICATIONS 12

Introduction - SNMP, SNMPV1-Architecture - Domain Name Service - Email -SMTP - HTTP.

L:45; T-15;TOTAL:60

TEXT BOOK:

1. Behrouz A.Forouzan, "Data Communication and Networking", 4th Edition, Tata McGraw-Hill Publishing Company, 2006.

To access Lecture Materials, PowerPoint Slides and Animated Figures from www.mhhe.com/forouzan.

REFERENCES:

1. William Stallings, "Data and Computer Communications", 5th Edition, PHI, 1997.
2. James F. Kurose and Keith W. Ross, "Computer Networking - A Top Down Approach featuring the Internet", 1st Edition, Addison Wesley Publishing Company, 2001.
3. Andrew S. Tanenbaum, "Computer Networks", Tata McGraw Hill, 3rd Edition, 2001
4. Larry L.Peterson & Bruce S. Davie, "Computer Networks - A systems Approach", 2nd Edition, Harcourt Asia/Morgan Kaufmanns, 2000.

YCA202 - OPERATING SYSTEMS

3 1 0 4

1. INTRODUCTION

12

Definition of OS-Mainframe System-Desktop Systems-Multi processor System-Distributed-Clustered-Real time Systems-Handheld Systems-Operating System Structure-System Components-Services-System Calls-System Programs-System Design and Implementation

2. PROCESS MANAGEMENT

12

Concepts-Process Scheduling-Operations on Processes-Co-operating Processes-Inter Process Communication-CPU Scheduling-Scheduling Concepts-Criteria-Scheduling Algorithms-Multiprocessor Scheduling-Real time Scheduling

3. PROCESS SYNCHRONIZATION

12

Critical Section-Synchronization Hardware-Semaphores-Problems of Synchronization-Critical Regions-Monitors-Deadlocks-Characterization-Handling Deadlocks-Deadlock Prevention-Avoidance-Detection-Deadlock Recovery

4. MEMORY MANAGEMENT

12

Storage Hierarchy-Storage Management Strategies-Contiguous-Non Contiguous Storage Allocation-Single User-Fixed Partition-Variable Partition-Swapping-Virtual Memory-Basic Concepts-Multilevel Organization-Block Mapping-Paging-Segmentation-Page Replacement Methods-Locality-Working Sets

5. I/O AND FILE SYSTEMS

12

Disk Scheduling-File Concepts-File System Structure-Access Methods-Directory Structure-Protection-Directory Implementation-Allocation Methods-Free Space Management-Case Study: Linux System

L:45; T-15;TOTAL:60

TEXT BOOK:

1. Silberschatz and Galvin, Operating System Concepts, 6th Edition, John Wiley & Sons, Inc., 2004

REFERENCES:

1. Milankovic M., Operating System Concepts and Design, 2nd Edition, McGraw Hill, 1992
2. P.C.Bhatt, An Introduction to Operating Systems-Concepts and Practice, Prentice Hall Of India, 2004
3. H.M.Deitel, An Introduction to Operating Systems, 2nd Edition, Pearson Education, 2002

1. INTRODUCTION**12**

Database Systems vs. File Systems-View of Data- Data Models-Database Languages-Transaction Management-Database Systems Structure-Application Architecture-History of Database Systems-Entity Relationship Model-Basic concept – Constraints –Keys-Design Issues-Entity Relationship Diagram – Extended E-R Features-Design of an E-R Database Schema-Reduction of an E-R Schema to table-UML Modeling Language.

2. RELATIONAL DATABASES**12**

SQL-Basic Structure-Set Operations- Aggregate functions-Null Value-Nested Sub queries-Views complex queries-Modification of database-Joined relations-DDL-Embedded SQL-Dynamic SQL-Other SQL Functions- -Integrity and Security -Relational Database Design

3. DATA STORAGE AND INDEXING**12**

Storage & File Structure- Disks - RAID -Tertiary storage - Storage Access -File Organization – organization of files - Data Dictionary storage - Indexing &Hashing - -B+ TREE - Static Hashing-Dynamic Hashing - Multiple Key Access

4. QUERY EVALUATION & OPTIMIZATION**12**

Query Processing - Measure of Query Cost - Selection Operation – Sorting - Join Operation - Evaluation of Expressions - Query Optimization.

5. TRANSACTION MANAGEMENT**12**

Transaction Concept - Static Implementation - Concurrency Control – Protocols - Deadlock Handling -Recovery Systems - Recovery with Concurrent Transactions - Shadow Paging - Buffer Management - Case Studies – Oracle - Microsoft SQL Server

L:45; T-15;TOTAL:60**TEXT BOOK:**

1. Abraham Silberschatz, Henry F.Korth and S.Sudharssan,"Database System Concepts", 4th Edition, Tata McGraw Hill, 2002.

REFERENCES:

1. Raghu Ramakrishnan & Johannes gerhrke, "Data Base Management Systems", Mc Graw Hill International Edition, 2000.

YCA204 - OBJECT ORIENTED PROGRAMMING IN C++ **3 0 0 3**

1. OOP PARADIGM **8**

Programming Paradigms-Procedural Programming-Modularity-Exception Handling-Data Abstraction-User Defined Types-Concrete Types-Abstract Types-Virtual Functions-Object Oriented Programming-Generic Programming-Containers-Algorithms

2. INTRODUCTION TO C++ **11**

Overview of C++-Classes and Objects-Friend Functions-Friend Classes-Inline Function-Static Members-Arrays-Pointers-References-Dynamic Allocation

3. OVERLOADING **7**

Function Overloading-Overloading Constructor Functions-Copy Constructors-Default Argument-Operator Overloading-Member Operator Overloading-Overloading new and delete

4. ADDITIONAL FEATURES **10**

Inheritance-Base Class-Access Control-Virtual Functions-Pure Virtual Functions-Templates-Generic Functions-Applying Generic Functions-Generic Classes-Exception Handling-C++ I/O Streams-File I/O-STL-Overview-Container Classes-Lists-Maps-Algorithms Using Functions and Objects-String Class

5. DESIGN CONCEPTS **9**

Role of Classes-Kinds of Classes-Concrete Types-Abstract Types-Nodes-Changing Interfaces-Object I/O-Actions-Interface Classes-Handles-Use Counts Applications frame works

L:45; TOTAL:45

TEXT BOOK:

1. Herbert Schildt,"C++ The Complete Reference", Tata McGrawHill Edition, 2003 (unit 2, 3, 4)
2. Bjanne Stroustrup,"The C++ Programming Language",3rd Edition, Addison Wesley, 2000 (Unit 1 & 5)

REFERENCES:

1. Robert Lafore."Waite Groups OOP in Turbo C++",Galgotia Publications, 2001
2. Stanley, B.Lippman,Jove Lagrie,"C++Primer",3rd Edition, Addison Wesley,1998

YCA205 - DATA STRUCTURES

3 1 0 4

1. DATA STRUCTURES

12

Introduction- Linear data structures and their sequential storage representations- Storage structure for Arrays-Structures and arrays of structures-Stack-Applications of Stacks. Queues – Priority Queue. Pointers and linked allocations.- Linked linear list- Applications of Linked Linear list-Polynomial Manipulation.

2. TREES

12

Non-linear data structures – Trees- Binary Trees-Traversing Binary Trees-Traversal Algorithms Using Stacks –Binary Search Trees-Searching, Inserting and Deleting in Binary Search trees. - Applications of trees - Manipulation of Arithmetic Expression – Symbol Table construction.

3. SORTING AND SEARCHING

12

Introduction-Merge sort- Quick sort- Binary sort – Insertion sort-basic search techniques- trees search techniques-tree searching- general search trees- Hashing.

4. GRAPHS AND THEIR REPRESENTATIONS

12

Graphs and its representation-Matrix Representation-List Structures- Breadth First Search- Depth First Search Spanning trees- Linked representation of graphs Applications of Graph- Shortest path algorithms- Warshall's Algorithm- Dijkstra's Algorithm.

5. STORAGE MANAGEMENT

12

Fixed block storage allocation-First fit storage Allocation- File Structures- External storage device-Sequential file structures-Processing Indexed Sequential files structure-processing direct file structures.

L:45; T-15;TOTAL:60

TEXT BOOKS:

1. Tremblay.J.P and Soreson, P.G., “ An introduction to Data Structures with Applications”. II edition, Tata McGraw Hill Publication Company Ltd; New Delhi 2002.
2. Schaum’S Outline of “Theory and Problems of Data Structures “ Seymour Lipschutz, Ph.D., Tata McGraw Hill Book Company, New Delhi.

REFERENCES:

1. A.V.Aho, J.E. Hopcroft and J.D. Ullman “Data Structures and Algorithms” Pearson Education Delhi –2002
2. Nicklaus Wirth. Algorithms and Data Structures Programmes “ Prentice Hall of India Pvt. Ltd., New Delhi 2002
3. Tanaenbaum A.S., Langram Y. Augestien M.J ”Data Structures Using C” Pearson Edfucation, 2004

1. **CLASS**
Implementation of Class-Constructor-Destructor-Friend class – Friend functions
- Static member function.
2. **OVERLOADING**
Implementation of overloading in function and operators - Unary and binary operators - Other operators.
3. **INHERITANCE**
Implementation of Inheritance – Simple – Multilevel – Multiple - Hybrid.
4. **POLYMORPHISM**
Implementation of Polymorphism-Virtual functions-Pure virtual functions.
5. **EXCEPTION HANDLING AND I/O STREAMS**
Exception handling – Creation and manipulation of files.
6. **DATA DEFINITION AND UPDATION**
Creation of table-Views-Insertion-Modification-Deletion of element - Partition.
7. **DATA CONTROL**
Implementation of DCL –TCL commands.
8. **DATA RETRIEVAL**
Implementation of quires - sub queries - co-correlated sub queries.
9. **SINGLE AND GROUP FUNCTIONS**
Implementation of Date, Numeric, Character, Group function, etc.,
10. **PL/SQL PROCEDURE AND BLOCKS.**
Implementation of Exception Handling - Cursors- Functions –Package- Triggers

P- 60;TOTAL:60

1. Represent of sparse matrix using one dimensional array and linked list.
2. Stack operations using arrays and linked lists
3. Queue operations using arrays and linked lists
4. Implement the operations on singly linked list, doubly linked list and circular linked list.
5. Binary tree traversals
6. Operations on binary search tree.
7. Sorting the numbers
 - (i) Heap
 - (ii) Quick
8. Graph Traversals
 - (i) Depth first search
 - (ii) Breadth first search
9. Shortest path using Dijkstra's algorithm.
10. Case study.

P:60; TOTAL:60