



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA

KAKINADA - 533 003, Andhra Pradesh, India

MCA I YEAR I SEMESTER STRUCTURE

S.No	Subject	T	P
1	C PROGRAMMING AND DATA STRUCTURES	4	-
2	DIGITAL LOGIC AND COMPUTER ORGANIZATION	4	-
3	DISCRETE MATHEMATICAL STRUCTURES AND GRAPH THEORY	4	-
4	PROBABILITY AND STATISTICAL APPLICATIONS	4	-
5	ACCOUNTING AND FINANCIAL MANAGEMENT	4	-
6	ENGLISH LANGUAGE COMMUNICATION SKILLS LAB	4	-
7	C PROGRAMMING AND DATA STRUCTURES LAB	-	3
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C PROGRAMMING AND DATA STRUCTURES

UNIT I :

Introduction to Computers, HW and SW concepts, Algorithm, pseudo code, flowchart, program development steps, Introduction to various IDE's and their use in C program development, structure of C program, A Simple C program, identifiers, basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation. Control structures such as if, goto, labels, and switch statements.

UNIT II:

Loops- while, do-while and for statements, break, continue, Arrays - concepts, declaration, definition, accessing elements, storing elements, Strings and string manipulations, 1- D arrays other than strings, 2-D character arrays – 2-D arrays other than character arrays – Multidimensional arrays.

UNIT III:

Functions: basics, parameter passing, storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, header files, C pre-processor. Passing 1-D arrays, 2-D arrays , and functions.

Pointers: concepts, initialization of pointer variables, pointers and function arguments, passing by address –dangling memory, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory managements functions, command line arguments.

UNIT IV:

Derived types: structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit-fields, Input and output – concept of a file, text files and binary files, Formatted I/o, file I/o operations

Data Structures: Introduction to Data Structures – Time Complexity – Space Complexity – Pattern matching – naive method – Robin Karp Algorithm - Searching – Linear and binary search methods, sorting – Bubble sort, selection sort, Insertion sort, Quick sort, merge sort.

UNIT V :

Single linked lists, doubly linked lists, circular list, representing stacks and queues in C using arrays and linked lists, infix to post fix conversion, postfix expression evaluation. Trees- Binary trees, terminology, representation, traversals, Graphs - terminology, representation, graph traversals (dfs & bfs) – Warshalls – Dijkstra – Kruskal – Prims Algorithms. Only Algorithms

Text Books:

- 1.
2. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.



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REFERENCES:

1. Fundamentals of Data Structures in C , Horowitz, Sahni, Anderson-Freed, 2nd ed, Universities Press,2008.
2. Classic Data Structures, Samanta,2nd ed, PHI, 2009.
3. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/ Pearson.
4. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
5. DataStructures Using C , A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/ Pearson.
6. Programming in C , Stephen G. Kochan, III Edition, Pearson .
7. Data Structures and Program Design in C, R.Kruse,, Tondo, Leung, Shashi M, 2nd Edition, Pearson.
8. Data Structures and Algorithms, Aho, Hopcroft, Ullman, Pearson ,2006
9. C and Data Structures, Ashok N.Kamthane, Pearson.
10. C Programming and Data Structures, E Balaguruswamy, TMH, 2008.



DIGITAL LOGIC AND COMPUTER SYSTEMS ORGANIZATION

UNIT I:

Digital Components and Data Representation: Introduction, Numbering Systems, Decimal to Binary Conversion, Binary Coded Decimal Numbers, Weighted Codes, Self-Complementing Codes, Cyclic Codes, Error Detecting Codes, Error Correcting Codes, Hamming Code for Error Correction, Alphanumeric Codes, ASCII Code

Boolean Algebra and Logic Gates: Introduction, Postulates of Boolean Algebra, Basic Theorems of Boolean Algebra, Duality Principle, Theorems, Precedence of operators, Venn Diagram, Boolean Functions and Truth Tables, Canonical Forms for Boolean Functions, Binary Operators and Logic Gates, Simplifying Boolean Expressions, Veitch-Karnaugh Map Method, Four Variable Karnaugh Map, Incompletely Specified Function, Quine-McCluskey Procedure

UNIT II:

Digital logic circuits: Combinatorial Switching Circuits,: Introduction, Combinatorial Circuit Design Procedure, Integrated NAND-NOR Gates, CMOS Transistor Gates, NAND-NOR Gates with CMOS Transistors, Open Drain and Tri-state Gates, Wired AND Gate, Driving a Bus from Many Sources, Tri-state Gates, Realization of Boolean Expressions Using NAND/NOR Gates, Combinatorial Circuits Commonly Used in Digital Systems, Design of Combinatorial Circuits with Multiplexers, Programmable Logic Devices, Realization with FPLAs, Realization with PALs

Sequential Switching Circuits: Types, Flip-Flops, Counters, Modelling Sequential Circuits – FSM. Synthesis of synchronous, Binary counters.

UNIT III:

Arithmetic and Logic Unit: Introduction, Binary Addition, Binary Subtraction, Complement, Representation of Numbers, Addition/Subtraction of Numbers in 1's Complement Notation, addition/Subtraction of Numbers in Two's Complement Notation, Binary Multiplication, Multiplication of signed Numbers, Binary division, Integer Representation, Floating Point Representation of Numbers, Binary Floating Point Numbers, IEEE Standard Floating Point Representation, Floating Point addition/Subtraction, Floating Point Multiplication, Floating Point Division, Floating Point Arithmetic Operations, Logic Circuits for Addition/Subtraction, Half- and Full-Adder Using Gates, A Four-bit Adder, MSI arithmetic Logic Unit, A Combinatorial Circuit for Multiplication

UNIT IV:

Central Processing Unit: Learning Goals, Introduction, Operation Code Encoding and Decoding, Instruction Set and Instruction Formats, Instruction set, Instruction Format, Addressing Modes, Register Sets, Clocks and Timing, CPU Buses, Dataflow, Data Paths and Microprogramming, Control Flow.

Micro programmed Control: Control Memory, Address Sequencing, Conditional Branching, Mapping of Instruction, Subroutines, Micro program Example, Computer Configuration, Microinstruction Format, Symbolic Microinstructions, The Fetch Routine, Symbolic Micro program, Binary Micro program, Design of Control Unit, Micro program Sequencer

UNIT V:

Memory Organization: Introduction, Memory hierarchy, Dynamic Random Access Memory, Error Detection and Correction in Memories, Read Only Memory, Dual-Ported RAM, Enhancing Speed and Capacity of Memories, Program Behaviour and Locality Principle, Cache in Memory Organization, Design and Performance of Cache



Memory System, Virtual Memory, address Translation, Page Replacement, Page Fetching, Page size, address Translation, Page Tables.

Input-Output Organization: Introduction, device Interfacing, Overview of I/O Methods, Program Controlled Data Transfer, Interrupt Structures, Single level Interrupt Processing, Handling Multiple Interrupts, Interrupt Controlled data Transfer, Software Polling, Bus Arbitration, Daisy Chaining, Vectored Interrupts, Multiple Interrupt Lines, VLSI Chip Interrupt Controller, Programmable Peripheral Interface Unit, DMA Based Data Transfer, Input/output (I/O) Processors, Bus Structure, Structure of a Bus Types of Bus, Bus Transaction Type, Timings of Bus Transactions, Bus Arbitration, some Standard Buses, Serial Data Communication, Asynchronous Serial data communication

TEXT BOOKS:

1. Digital Logic and Computer Organization, Rajaraman, Radhakrishnan, PHI, 2006
2. Digital Logic Design, Morris Mano, PHI
3. Computer System Architecture, 3rd ed., M. Morris Mano, PHI, 1994

REFERENCE BOOKS:

1. Computer Organization, 5th ed., Hamacher, Vranesic and Zaky, TMH, 2002
2. Computer System Organization & Architecture, John D. Carpinelli, Pearson, 2008
3. Computer System Organization, Naresh Jotwani, TMH, 2009
4. Computer Organization & Architecture: Designing for Performance, 7th ed., William Stallings, PHI, 2006



DISCRETE MATHEMATICAL STRUCTURES AND GRAPH THEORY

UNIT I :

Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Theory of inference for the statement calculus, Rules of inference, Consistency of premises and indirect method of proof, Automatic Theorem Proving

Predicate calculus: Predicates, statement functions, variables and quantifiers, predicate formulas, free & bound variables, universe of discourse, inference theory of predicate calculus

UNIT II

Set theory & Relations: Introduction, Relations and ordering, Properties of binary Relations, Equivalence, Compatibility Relations, Partial ordering, Hasse diagram.

Functions: composition of functions, Inverse Function, Recursive Functions, Lattice and its Properties, Pigeon hole Principles and its application.

Algebraic structures: Algebraic systems, Examples and general properties, Semi groups and monoids, groups, sub groups, Definitions, Examples, homomorphism, Isomorphism and related problems.

UNIT III

Elementary Combinatorics: Basis of counting, Enumeration of Combinations & Permutations, Enumerating of Combinations & Permutations with repetitions and constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, principles of Inclusion – Exclusion.

UNIT IV

Recurrence Relations: Generating Function of Sequences, Calculating Coefficient of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, The method of Characteristic roots, Solution of Inhomogeneous Recurrence Relation.

UNIT V

Graph Theory: Representation of Graph, Spanning Trees, BFS, DFS, Kruskals Algorithm, Binary trees, Planar Graphs, Graph Theory and Applications, Basic Concepts, Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to computer science J.P Tremblery, R.Manohar, TMH
2. Discrete Mathematical for computer Scientists & Mathematicians “ J.L. Molt, A.Kandel ,T.P.Baker, PHI

REFERENCE TEXTBOOKS:

1. Elements of Discrete Mathematics, C L Liu, D P Mohanpatra, TMH
2. Discrete Mathematics, Schaum's Outlines, Lipschutz, Lipson, TMH.
3. Discrete Mathematical Structures, Kolman, Busby, Ross, 6th ed., PHI, 2009
4. Discrete Mathematics, Johnsonbaugh, 6th ed., Pearson, 2005
5. Discrete Mathematics, Malik, Sen, 6th ed., Cengage Learning, 2004



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6. Discrete Mathematics for computer science, Bogart, Stein and Drysdale, Springer, 2005
7. Discrete Mathematics and Combinatorics, Sengadir, Pearson, 2009
8. Discrete and Combinatorial Mathematics, Grimaldi, Ramana, 5th ed., Pearson. 2006
9. Mathematical Foundations of Computer Science, Rajendra Prasad, Rama Rao et al., USP, 2009
10. Discrete Mathematics, J K Sharma, 2nd ed., Macmillan, 2005
11. Discrete Mathematics with Combinatorics and Graph Theory, Santha, Cengage Learning, 2009
12. Applied Discrete Structures For Computer Science, Alan Doerr, Levassure, GP, 2005
13. Discrete Mathematics with Applications, Koshy, Elsevier, 2006.
14. Discrete Mathematics and its Applications, Rosen, 5th ed, T M Graw-Hill ed, 2006.
15. Discrete Mathematics for Computer Science, Gary Haggard, John Schlipf, Sue Whitesides, Cengage., 2006.
16. Discrete Mathematical, Kevin Ferland, Cengage, 2008.
17. Discrete Mathematical Structures, Jayant Ganguly, Sanguine, 2007.



PROBABILITY AND STATISTICAL APPLICATIONS

UNIT I :

Probability Theory: Sample spaces Events & Probability; Discrete Probability; Union , intersection and compliments of events; Conditional probability ;Baye's theorem.

UNIT II

Random variables and distribution: Random variables Discrete Probability Distributions,. Continuous probability distribution, Binomial, Poisson, uniform, Exponential, Normal.

UNIT III

Expectations and higher order moments – Moment Generating Function, Characteristic functions – Laws on large numbers – Weak Laws and strong laws of large numbers. Central limit theorem and other limit theorems. Sampling distribution: Populations and samples - Sampling distributions of mean (σ known and unknown) proportions, sums and differences. Statistics based on Normal, Student's t and F distributions.

UNIT IV: Tests of significance –Z-test, t-test, F-test, χ^2 test
Linear correlation coefficient Linear regression ; Non Linear regression Least square fit ; polynomial and Curve fittings
Time series and Forecasting : Moving averages , Smoothing of curves
Forecasting models and methods , Statistical Quality Control Methods-bar charts p-charts etc.

UNIT V

Queuing theory – Markov Chains – Introduction to Queuing systems – Elements of a queuing model – Exponential distribution – Pure birth and death models. Generalized Poisson Queuing model – Specialized Poisson Queues.

TEXT BOOKS:

1. Probability, Statistics and Random Processes Dr.K.Murugesan & P.Gurusamy by Anuradha Agencies, Deepti Publications.
2. Probability, Statistics and Random Processes , T.Veerarajan, TMH, India

REFERENCE BOOKS:

1. Probability and Statistics for Engineers: Miller and Freund, PHI.
2. Probability, Statistics and Queuing Theory Applications, 2nd ed, Trivedi, John Wiley and Sons.



ACCOUNTING AND FINANCIAL MANAGEMENT

UNIT 1:

Accounting Generally Accepted Accounting Principles (GAAP) & Accounting standards, Characteristics and limitations of single entry system, double entry system of accounting, introduction of basis books of accounts, ledgers.

Preparation of trail balance – Final accounts – company final accounts – Users of Accounting Information, Role of Accountant in modern Organizations.

UNIT II :

Financial Management – meaning and scope, role, objectives of time value of money – over vitalization – under capitalization – profit maximization – wealth maximization – EPS maximization.

Ration Analysis - advantages - limitations - Fund flow analysis – meaning, importance, preparation and interpretation of Funds flow and cash flow statements – statements of changes in working capital.

UNIT – III

Costing – nature and importance and basic principles. Elements of cost – Absorption costing Vs. Marginal costing – Financial accounting Vs. cost accounting Vs. management accounting.

Marginal costing and Break – even Analysis : nature, scope and importance – practical applications of marginal costing, limitation and importance of cost – volume, profit analysis, short run decisions.

UNIT IV :

Standard costing and budgeting : nature, scope and computation and analysis – materials variance, labor variance and sales variance – cash budget, sales - budget – flexible Budgets, master budgets.

UNIT V:

Introduction to computerized accounting system: coding logic and codes, master files, transaction files, introduction documents used for data collection, processing of different files and Ourputs obtained.

REFERENCES :

1. Accounting for Managers, P. Vijaya Kumar, and Himalaya Publications.
2. Accounting for Management. Vijaya Kumar. TMH.
3. Financial Accounting, S.N Maheswari and S.K. Maheswari, Vikas.
4. Financial Accounting, A. Mukherjee and M. Heneef, TMH.
5. Basic Financial Accounting for Management, Ambaresh Gupta, Pearson.
6. Accounts And Finance for Non accounts, Chatterjee, D.K. Himalaya.
7. Financial Analysis and Accounting, P. Premchand Babu and M. Madam Mohan, Himalaya.
8. Essential of Financial Accounting, Ashish, K and Ballacharya, PHI.
9. Guide to Financial Management, John Tannent, Viva.



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ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

Objectives: The language lab focuses computer-aided multi-media instruction and language acquisition to achieve the following targets:

1. To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
2. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams such GRE, TOEFL, GMAT etc.
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
4. To train them to use language effectively to face interviews, group discussions, public speaking.
5. To initiate them into greater use of the computer in resume preparation, report writing, format- making etc.

However, depending upon the available of infrastructure and budget, the above targets can also be achieved by procuring the minimum required equipment suggested for the establishment of Conventional Lab the details of which are given below. The lab should cater to the needs of the students to build up their confidence to help them develop leadership qualities through through their communicative competence.

ENGLISH LANGUAGE LABORATORY PRACTICE

1. Introduction to Phonetics. 2. Introduction to Vowels and Consonants and associated Phonetic symbols. 3. Introduction to Accent, Intonation and Rhythm. 4. Situational Dialogues/Role Play. 5. Debate 6. Public Speaking. 7. Group Discussions 8. Facing Interviews 9. Resume preparation 10. e- correspondence

MODULE	TOPICS/SUB-TOPICS	LAB SESSION
1.	INTRODUCTION TOPHONETICS -Vowels, -Consonants, -Diphthongs INTRODUCTION TO STRESS & INTONATION -Articulation, -Respiration, -Phonation	3
2.	GROUP DISCUSSIONS FACING INTERVIEWS	4
3	SITUATIONAL/DIALOGUE/ ROLE PLAY RESUME PREPARATION	2
4	PUBLIC SPEAKING, DEBATE	2
5	GRE,TOEFL,GMAT MODELS, e-CORRESPONDENCE	3

Suggested Software for Lab classes:

Cambridge Advanced Learners' Dictionary with exercises
The Rosetta Stone English Library
Clarity Pronunciation Power
Mastering English in Vocabulary, Grammar, Spellings, Composition
Dorling Kindersley series of Grammar, Punctuation, Composition etc.



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Oxford Advanced Learner's Compass, 7th Edition
Language in Use, Foundation Books Pvt Ltd
Learning to Speak English - 4 CDs
Microsoft Encarta
Murphy's English Grammar, Cambridge
Time series of IQ Test, Brain-teasers, Aptitude Test etc.
English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy,
Cambridge

Reference Books:

1. The Human Touch: personal Skills for Professional Success – by Debra Paul.
2. The Definitive Book of body Language – by Allan Pease, Barbara Pease.
3. How to Face Interviews – by Clive Fletcher.
4. The 7 Habits of Highly Effective People – by Stephen Covey.
5. The Google Resume: How to Prepare of a Career and Land a Job at Apple, Microsoft.
6. Good English –by G.H Vallins
7. Better English – G.H Vallins
8. Best English – G.H. Vallins
9. How to Talk to Anyone: 92 little tricks for big success in Relationships by Leli Lowndes.
10. The leader in you - by Dale Carnegie
11. 250 Job Interview Questions You'll most likely Be Asked – by Peter veluki, Peter Verki.
12. Contemporary English Grammer, structures and Composition - by David Green.



**COMPUTER PROGRAMMING DATA
STRUCTURES LAB**

Objectives:

- To learn/strengthen a programming language like C, To learn problem solving techniques
- To Introduce the student to simple linear and non linear data structures such as lists, stacks, queues, etc.,

Recommended Systems/Software Requirements:

- Intel based desktop PC, ANSI C Compiler with Supporting Editors, IDE's such as Turbo C, Bloodshed C

Exercise 1.

- Write a C program to find the sum of individual digits of a positive integer.
- A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
- Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
- Write a program which checks a given integer is Fibonacci number or not.

Exercise 2.

- Write a C program to calculate the following Sum:
$$\text{Sum} = 1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$$
- Write a C program to find the roots of a quadratic equation.
- Write a C program to implement Newton Raphson method for a quadratic equation
- Write a C program to implement Newton Raphson method for a general purpose algebraic equation

Exercise 3

- Write C programs that use both recursive and non-recursive functions
 - To find the factorial of a given integer.
 - To find the GCD (greatest common divisor) of two given integers.
 - To solve Towers of Hanoi problem.
 - Write program to calculate probability of head/tail by generating random numbers using random() function.

Exercise 4

- The total distance travelled by vehicle in 't' seconds is given by distance = $ut + 1/2at^2$ where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec²). Write C program to find the distance travelled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.
- Write a C program, which takes two integer operands and one operator form the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use Switch Statement)

Exercise 5

- Write a C program to find both the largest and smallest number in a list of integers.
- Write a C program that uses functions to perform the following:
 - Addition of Two Matrices
 - Multiplication of Two Matrices
 - Checking symmetricity of a square matrix.
 - Calculating transpose of a



matrix in-place manner.

Exercise 6

- a) Write a C program that uses functions to perform the following operations:
 - i) To insert a sub-string in to given main string from a given position.
 - ii) To delete n Characters from a given position in a given string.
- b) Write a C program to determine if the given string is a palindrome or not

Exercise 7

- a) Write a C program that displays the position/ index in the string S where the string T begins, or -1 if S doesn't contain T.
- b) Write a C program to count the lines, words and characters in a given text.

Exercise 8

- a) Write a C program to generate Pascal's triangle.
- b) Write a C program to construct a pyramid of numbers.

Exercise 9

Write a C program to read in two numbers, x and n , and then compute the sum of this geometric progression: $1+x+x^2+x^3+\dots+x^n$

For example: if n is 3 and x is 5, then the program computes $1+5+25+125$. Print x , n , the sum

Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if $n < 0$, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal ? If so, test for them too.

Exercise 10

- a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.
- b) Write a C program to convert a Roman numeral to its decimal equivalent.

Exercise 11

Write a C program that uses functions to perform the following operations using Structure:

- i) Reading a complex number
- ii) Writing a complex number
- iii) Addition of two complex numbers
- iv) Multiplication of two complex numbers

Exercise 12

- a) Write a C program which copies one file to another.
- b) Write a C program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)

Exercise 13

- a) Write a C program that uses functions to perform the following operations on singly linked list.:
 - i) Creation ii) Insertion iii) Deletion iv) Traversal
- b) Adding two large integers which are represented in linked list fashion.

Exercise 14

Write a C program that uses functions to perform the following operations on doubly



linked list.:

- i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways

Exercise 15

- a.) Write C programs that implement stack (its operations) using
 - i) Arrays ii) Pointers iii) linked list.

Exercise 16

- a. Write C programs that implement Queue (its operations) using
 - i) Arrays ii) Pointers iii) linked lists.

Exercise 17

Write a C program that uses Stack operations to perform the following:

- i) Converting infix expression into postfix expression ii) Evaluating the postfix expression

Exercise 18

- a. Write a C program that uses functions to perform the following:
 - i) Creating a Binary Tree of integers
 - ii) Traversing the above binary tree in preorder, inorder and postorder.
- b. Program to check balance property of a tree.
- c. Program to check for its strictness.

Exercise 19

Write C programs that use both recursive and non recursive functions to perform the following searching operations

- for a Key value in a given list of integers : i) Linear search ii) Binary search

Exercise 20

Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:

- i) Bubble sort ii) Quick sort

Exercise 21

a. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:

- i) Insertion sort ii) Bubble sort

- b. Recursive implementation of sorting algorithms.

Exercise 22

Write C programs to implement the Lagrange interpolation and Newton- Gregory forward interpolation.

Exercise 23

- a. Program to calculate mean and standard deviation of a population.
- b. Write C programs to implement the linear regression and polynomial regression algorithms.

Exercise 24

- a. Write C programs to implement Trapezoidal and Simpson methods. and b) Program for Calculating pi value.



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2. Digital Logic and Computer Organization, Rajaraman, Radhakrishnan, PHI, 2006



DIGITAL LOGIC AND COMPUTER SYSTEMS ORGANIZATION (DLCSO) LAB

Exercise 1

Boolean Algebra: Theorems and logical guides, verification of truth tables

Exercise 2

Realization of Boolean expressions ; Using (i) AND – OR-NOT Gates (ii) NAND Gates (iii) NOR Gates

Exercise 3

Latches Flip – Flops : RS, JK,T,D, Master –Slave FF, Edge – Triggered Flip – Flops

Exercise 4

Counters: Binary Counter, Synchronous/Asynchronous Binary Counter, Ripple Counter, Decade Counter, Up/Down Counter

Exercise 5

Modulo Counter: Modulo - 5, Modulo – 10

Exercise 6

Adders / Sub tractors: Half Adder, Full Adder, 1 's and 2's complement addition

Exercise 7

Multiplexers/ Data Selector : 2- input and 8- input, Demultiplexers , Logic Function Generator

Exercise 8

Decoders and Encoders

Exercise 9

BCD adders and Comparators

Exercise 10

Registers: Basic Shift Register (SR), SI/SO SR, SI/PO SR, PI/SO SR, PI/PO SR

Exercise 11

Johnson Counter, Sequence Generator, Parity Generators/ Checkers

Exercise 12

Code Converters : Decimal –to-Binary, Binary – to – Decimal, Decimal – to- Hexa Decimal, BCD- to –Decimal, Binary – to- gray, gray- to -Binary

Exercise 13

Buffers / Derivers : Open ; collector Buffers

Exercise 14

Gates : CMOS / NMOS/TTL – Basic Operational Characteristics and parameters

Exercise 15

RAM, ROM, PROM, EPROM – Testing Memory Chips



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