

M.D. UNIVERSITY, ROHTAK**Scheme of studies & Examination
Bachelor of Technology (Computer Software and Hardware Engineering)
SEMESTER III
'F' Scheme Effective from 2011-2012**

Subject Code	Course Title	Teaching Schedule				Marks of Class Work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
CSHE-03-01-F	Mathematics-III	3	1	-	4	50	100	-	150	3
CSHE-03-02-F	Digital Circuit and Logic and Design	3	1	-	4	50	100	-	150	3
CSHE-03-03-F	Computer Architecture and Organization	3	1	-	4	50	100	-	150	3
CSHE-03-04-F	Discrete Structure	3	1	-	4	50	100		150	3
CSHE-03-05-F	Economics	3	1	-	4	50	100	-	150	3
CSHE-03-06-F	Data Structure & Algorithm	3	1	-	4	50	100	-	150	3
CSHE-03-07-F	Data-Structures Lab			4	4	50		50	100	3
CSHE-03-08-F	C++ Programming Lab			4	4	50		50	100	3
CSHE-03-09-F	Digital and Analog Circuits Laboratory			4	4	50		50	100	3
	Total	18	6	12	36	450	600	150	1300	

Note:

- 1) Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

M.D. UNIVERSITY, ROHTAK

**Scheme of studies & Examination
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SEMESTER IV
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Subject Code	Course Title	Teaching Schedule				Marks of Class Work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
CSHE-04-01-F	Microprocessor and Programming	3	1	-	4	50	100		150	3
CSHE-04-02-F	Data Communication	3	1	-	4	50	100		150	3
CSHE-04-03-F	Analog Electronics	3	1	-	4	50	100		150	3
CSHE-04-04-F	Programming Languages	3	1	-	4	50	100		150	3
CSHE-04-05-F	Theory of Automata Computation	3	1	-	4	50	100		150	3
CSHE-04-06-F	Internet fundamentals	3	1	-	4	50	100		150	3
CSHE-04-07-F	Microprocessor and Programming Lab			4	4	50		50	100	3
CSHE-04-08-F	Analog Electronics Lab			4	4	50		50	100	3
CSHE-04-09-F	Internet Lab			4	4	50		50	100	3
CSHE-04-10-F	General Proficiency					50	100		150	
	Total	18	6	12	36	500	700	150	1350	

Note:

- 1 Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.
- 2 Assessment of Practical Training-I, undergone at the end of IV semester, will be based on seminar, viva-voce, report and certificate of practical training obtained by the student from the industry. According to performance letter grades A, B, C, F are to be awarded. A student who is awarded 'F' grade is required to repeat Practical Training.

M.D. UNIVERSITY, ROHTAK

**Scheme of studies & Examination
Bachelor of Technology (Computer Software and Hardware Engineering)
SEMESTER V
'F' Scheme Effective from 2011-2012**

Subject Code	Course Title	Teaching Schedule				Marks of Class Work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
CSHE-05-01-F	Probability and Queuing Theory	3	1	-	4	50	100	-	150	3
CSHE-05-02-F	MOS-IC Technology	3	1	-	4	50	100	-	150	3
CSHE-05-03-F	Principle of Operating System	3	1	-	4	50	100		150	3
CSHE-05-04-F	Computer Graphics	3	1	-	4	50	100		150	3
CSHE-05-05-F	Analysis Design & Algorithms	3	1	-	4	50	100		150	3
CSHE-05-06-F	Web Development	3	1		4	50	100		150	3
CSHE-05-07-F	Computer Graphics Lab			4	4	50		50	50	3
CSHE-05-08-F	Web Development Lab			4	4	50		50	50	3
CSHE-05-09-F	Operating System Lab			4	4	50		50	50	3
	Total	18	6	12	36	450	600	150	1300	

Note:

- 1 Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

M.D. UNIVERSITY, ROHTAK

**Scheme of studies & Examination
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SEMESTER VI
'F' Scheme Effective from 2011-2012**

Subject Code	Course Title	Teaching Schedule				Marks of Class Work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
CSHE-06-01-F	Digital System Design	3	1	-	4	50	100	-	150	3
CSHE-06-02-F	Computer Network	3	1	-	4	50	100		150	3
CSHE-06-03-F	Multimedia Technology	3	1	-	4	50	100		150	3
CSHE-06-04-F	Principle of Software Engineering	3	1		4	50	100		150	3
CSHE-06-05-F	Intelligent System	3	1		4	50	100		150	3
CSHE-06-06-F	System Programming and System Administration	3	1		4	50	100		150	3
CSHE-06-07-F	Digital System Design Lab			4	4	50		50	100	3
CSHE-06-08-F	Multimedia Lab			4	4	50		50	100	3
CSHE-06-09-F	Intelligent System Lab			4	4	50		50	100	3
CSHE-06-10-F	General Proficiency					50	100		150	
	Total	18	6	1 6	40	500	700	150	1350	

Note:

1. Each student has to undergone practical training of 6 weeks during summer vacation and its evaluation shall be carried out in the VII semester.
2. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

M.D. UNIVERSITY, ROHTAK

**Scheme of studies & Examination
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SEMESTER VII
'F' Scheme Effective from 2011-2012**

Subject Code	Course Title	Teaching Schedule				Marks of Class Work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
CSHE-07-01-F	Neural Network and Fuzzy logic	3	1	-	4	50	100	-	150	3
CSHE-07-02-F	Advanced Computer Architecture	3	1	-	4	50	100		150	3
CSHE-07-03-F	Software Project Management	3	1		4	50	100		150	3
CSHE-07-04-F	Compiler Design	3	1		4	50	100		150	3
CSHE-07-05-F	Elective 1	3	1		4	50	100		150	3
CSHE-07-06-F	Compiler Design Lab			4	4	50		50	100	3
CSHE-07-07-F	Visual Programming Lab			4	4	50		50	100	3
CSHE-07-08-F	Project			4	4	50		50	100	3
CSHE-07-09-F	Mini Project			2	2					
	Total	15	5	14	34	400	500	150	1050	

List of Open Electives:

1. HUM-451-E Language Skills for Engineers
2. HUM-453-E Human Resource Management
3. HUM-457-E Business Communication
4. HUM-455-E Entrepreneurship
5. PHY-451-E Nano technology
6. PHY-453-E Laser Technology
7. ME-451-E Mechatronics Systems
8. CSE-451-E Artificial Intelligence & Expert Systems
9. CSE-303-E Computer Graphics
10. IC-455-E Intelligent Instrumentation for Engineers
11. IC-403-E Embedded Systems
12. CH-453-E Pollution & Control
13. IT-471-E Management Information System
14. IT-204-E Multimedia Technologies

Note

1. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.
2. *Student will be permitted to opt for any one elective run by the other departments. However, the departments will offer only those electives for which they have expertise. The choice of the students for any elective shall not be a binding for the department to offer, if the department does not have expertise.
3. Assessment of Mini Project, carried out at the end of VI semester, will be based on seminar, viva-voce and project report of the student from the industry. According to performance, letter grades A, B, C, F are to be awarded. A student who is awarded 'F' grade is required to repeat Practical Training.
4. Project load will be treated as 2 hours per week for Project Coordinator and 1 hour for each participating teacher. Project will commence in VII semester where the students will identify the Project problem, complete the design/procure the material/start the fabrication/complete the survey etc., depending upon the nature of the problem. Project will continue in VIII semester.

M.D. UNIVERSITY, ROHTAK

Scheme of studies & Examination Bachelor of Technology (Computer Software and Hardware Engineering) SEMESTER VIII 'F' Scheme Effective from 2011-2012

Subject Code	Course Title	Teaching Schedule				Marks of Class Work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
CSHE-08-01-F	Distributed Operating System	3	1		4	50	100		150	3
CSHE-08-02-F	Advanced JAVA	3	1		4	50	100		150	3
CSHE-08-03-F	Elective II	3	1		4	50	100		150	3
CSHE-08-04-F	Elective III	3	1		4	50	100		150	3
CSHE-08-05-F	Advanced JAVA Lab			4	4	50	50		100	3
CSHE-08-06-F	Seminar			3	3	50			50	
CSHE-08-07-F	Project			8	8	100	200		300	3
CSHE-08-08-F	General Proficiency					50	100		150	
	Total	12	4	15	31	450	750		1200	

Note:-

- 1) Project load will be treated as 2 hrs. per week for the project coordinator and 1 hour for each participating teacher. Project involving design, fabrication, testing, computer simulating, case studies etc., which has been commenced by students in VII semester will be completed in VIII semester.
- 2) For the subject CSE-408 E, a student will select a topic from emerging areas of computer science and engineering and study it thoroughly and independently. Later he will give a seminar talk on the topic
- 3) A team consisting of Principal/Director, HOD of concerned department and external examiner appointed by university shall carry out the evaluation of the students for his/her general fitness for the profession.
- 4) Students will be allowed to use the non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

Elective II

- 1 Network Security and Management
- 2 Digital Image Processing

CSHE-03-01-F

Mathematics-III
(Common For All Branches)

L T P	Class Work	:	50 Marks
3 2 -	Exam	:	100 Marks
	Total	:	150 Marks
	Duration of exam.	:	3Hours

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section-A

Fourier Series and Fourier Transforms : Euler's formulae, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and cosine series.

Fourier integrals, Fourier transforms, Shifting theorem (both on time and frequency axes), Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem, Fourier transform of Dirac-delta function.

Section -B

Functions of Complex Variable : Definition, Exponential function, Trigonometric and Hyperbolic functions, Logarithmic functions. Limit and Continuity of a function, Differentiability and Analyticity.

Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations. Harmonic functions, application to flow problems. Integration of complex functions. Cauchy-Integral theorem and formula. Power series, radius and circle of convergence, Taylor's Maclaurin's and Laurent's series. Zeros and singularities of complex functions, Residues. Evaluation of real integrals using residues (around unit and semi circle only).

Section -C

Probability Distributions and Hypothesis Testing: Conditional probability, Bayes theorem and its applications, expected value of a random variable. Properties and application of Binomial, Poisson and Normal distributions.

Testing of a hypothesis, tests of significance for large samples, Student's t-distribution (applications only), Chi-square test of goodness of fit.

Section -D

Linear Programming: Linear programming problems formulation, solving linear programming problems using

(i) Graphical method (ii) Simplex method (iii) Dual simplex method.

TEXT BOOKS:

1. Advanced Engg. Mathematics : F Kreyszig.
2. Higher Engg. Mathematics : B.S. Grewal.

REFERENCE BOOKS:

1. Advance Engg. Mathematics : R.K. Jain, S.R.K.Iyenger.
2. Advanced Engg. Mathematics : Michael D. Greenberg.
3. Operation Research : H.A. Taha.
4. Probability and statistics for Engineers : Johnson. PHI.

Digital Circuit & Logic Design

CSHE-03-02-F

L T P
4 1 -

Class Work	:	50 Marks
Exam	:	100 Marks
Total	:	150 Marks
Duration of exam.	:	3Hours

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

SECTION A

Binary Systems: Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic. Boolean Algebra And Logic Gates: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operations, Digital logic gages, integrated circuits.

SECTION B

Gate – Level Minimization: The map method, Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – Or function, Hardware Description language (HDL).

Combinational Logic: Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtractor Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers, HDL for combinational circuits.

SECTION C

Synchronous Sequential Logic: Sequential circuits, latches, Flip-Flops Analysis of clocked sequential circuits, HDL for sequential circuits, State Reduction and Assignment, Design Procedure. Registers and Counters: Registers, shift Registers, Ripple counters synchronous counters, other counters, HDL for Registers and counters.

SECTION D

Memory, CPLDs, and FPGAs: Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction Read-only memory, Programmable logic Array programmable Array logic, Sequential Programmable Devices.

Asynchronous Sequential Logic: Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduciton of state and Flow Tables, Race-Free state Assignment Hazards, Design Example.

BOOKS RECOMMENDED

1. **DIGITAL DESIGN – Third Edition , M.Morris Mano, Pearson Education/PHI.**
2. **Digital Principles and Design – Donald D.Givone, Tata McGraw Hill, Edition.**
3. **John F Wakerly, “Digital Design Principles and Practices 3/e”, Pearson Education 2001.**
4. **J P. Hayes, “Introduction to Digital Logic Design”, Addison-Wesley Publishing Co**
5. **Charles H. Roth, Jr. Fundamentals of logic design, Cengage Learning, New Delhi**

CSHE-03-03-F Computer Architecture & Organization

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions

SECTION A

Introduction: Historical overview, economic trends, underlying technologies, Data Representation- Data Types, Complements. Fixed-Point Representation, Floating-Point Representation. Error Detection and Correction. Addition, Subtraction, Multiplication and Division algorithms and hardware.

Register Transfer and Micro operations: Register transfer language, Inter-Register Transfer, Arithmetic Micro-operations, Logic and Shift micro-operations Language, Control functions.

SECTION B

Arithmetic Logic Unit: Arithmetic, logic and shift micro operations. Constructing an arithmetic logic shift unit.

Basic Computer Architecture and Design: Computer registers, Computer Instructions-Instruction Set Completeness. Classifying Instruction Set Architecture. Basic steps of Instruction Execution. Hardwired Control. Micro programmed Control. Horizontal and Vertical Microprogramming. Interrupts.

SECTION C

Central Processing Unit: General Register Organization. Stack Organized CPU. Instruction Formats, Addressing Modes. Data Transfer and Manipulation.RISC Vs CISC.
Pipelining: Parallel and pipeline Processing, Pipeline Control, Pipeline Implementations, Conflicts Resolution, and Pipeline Hazards. Vector Processing, and Array Processors.

Memory Organization: Memory Systems: principle of locality, principles of memory hierarchy Caches, associative memory, main memory, Virtual memory, Paging and Segmentation, Memory Interleaving.

SECTION D

Input Output Organization: I/O performance measures, types and characteristics of I/O devices, I/O Modes-Programmed I/O, Interrupt Initiated I/O and DMA.Buses: connecting I/O devices to processor and memory,interfacing I/O devices to memory, processor, and operating system.

Parallel Computers: Classification, SIMD, MIMD Organizations, Connection Networks, Data Flow Machines, and Multithreaded Architectures.

BOOKS RECOMMENDED

1. M Moris Mano, "Computer System Architecture", Pearson Education, 3rd Edition 1993.
2. David A. Patterson and John L. Hennessy, "Computer Organization & Design The Hardware/Software Interface", Morgan Kaufmann, 2nd Edition 1997.
3. William Stallings, "Computer Organisation and Architecture, Designing for Performance", Pearson Education Asia, 6th Edition 2003.
4. Harry F. Jordan and Gita Alaghband, "Fundamentals of Parallel Processing", Pearson Education, 1st Edition 2003.
5. Barry Wilkinson Michael Allen, "Parallel Programming", prentice hall, 1999.

Data Structures & Algorithms

Class Work : 50 Marks

CSHE-03-06-F

L T P

3 1 -

Exam : 100 Marks

Total : 150 Marks

Duration of Exam : 3 Hrs.

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section -A

Introduction to Data Structures: Definition of data structures and abstract data types, Static and Dynamic implementations, Examples and real life applications; The Stacks : Definition, Array based implementation of stacks, Linked List based implementation of stacks, Examples : Infix, postfix, prefix representation, Conversions, Applications.

Section -B

Queues and Lists: Definition, Array based implementation of Queues / Lists, Linked List implementation of Queues / Lists, Circular implementation of Queues and Singly linked Lists, Straight / circular implementation of doubly linked Queues / Lists, Priority Queues, Applications.

Trees: Definition of trees and Binary trees, Properties of Binary trees and Implementation, Binary Traversal pre-order, post order, In- order traversal, Binary Search Trees, Implementations, Threaded trees, Balanced multi way search trees, AVL Trees, Implementations

Section -C

Graphs: Definition of Undirected and Directed Graphs and Networks, The Array based implementation of graphs, Adjacency matrix, path matrix implementation, The Linked List representation of graphs, Shortest path Algorithm, Graph Traversal – Breadth first Traversal, Depth first Traversal, Tables : Definition, Hash function, Implementations and Applications.

Running time: Time Complexity, Big – Oh - notation, Running Times, Best Case, Worst Case, Average Case, Factors depends on running time, Introduction to Recursion, Divide and Conquer Algorithm, Evaluating time Complexity.

Section -D

Sorting Algorithms : Introduction, Sorting by exchange, selection, insertions : Bubble sort, Straight selection sort, Efficiency of above algorithms.; Shell sort, Performance of shell sort, Merge sort, Merging of sorted arrays & Algorithms; Quick sort Algorithm analysis,

Heap sort: Heap Construction, Heap sort, bottom – up, Top – down Heap sort approach;

Searching Algorithms: Straight Sequential Search, Binary Search (recursive & non-recursive Algorithms)

Text Book:

- Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.

Reference Books:

- Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
- Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
- Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
- Data Structures and Program Design in C By Robert Kruse, PHI,
- Theory & Problems of Data Structures by Jr. Seymour Lipschetz, Schaum's outline by TMH
- Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
- Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

Discrete Structures

Class Work	:	50 Marks
Exam	:	100 Marks
Total	:	150 Marks
Duration of Exam	:	3 Hrs.

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section -A

Set Theory: Introduction to set theory, Set operations, Algebra of sets, Duality, Finite and Infinite sets, Classes of sets, Power Sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Equivalence relations and partitions, Partial ordering relations and lattices Function and its types, Composition of function and relations, Cardinality and inverse relations

Propositional Calculus: Basic operations: AND(\wedge), OR(\vee), NOT(\sim), Truth value of a compound statement, propositions, tautologies, contradictions.

Section -B

Techniques Of Counting: Permutations with and without repetition, Combination.

Recursion And Recurrence Relation: Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

Section -C

Algebraic Structures: Definition and examples of a monoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem

Section -D

Graphs And Trees: Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eulerian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Trees, Spanning trees, Binary trees and its traversals

Text Book:

- Elements of Discrete Mathematics C.L Liu, 1985, McGraw Hill

Reference Books:

- Discrete Mathematics by Johnson Bough R., 5th Edition, PEA, 2001..
- Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashik, 1989, Addison-Wesley.
- Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press.
- Applied Discrete Structures for Computer Science, Doerr and Levasseur, (Chicago: 1985,SRA
- Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold,London,
- Schaums Outline series: Theory and problems of Probability by S. Lipshutz, 1982, McGraw-Hill Singapore
- Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI
- Discrete Mathematical Structures with Applications to Computers by Tembley & Manohar, 1995, Mc Graw Hill.

Economics
(Common For All Branches)

L T P
3 1 -

Class Work : 50 Marks
Theory : 100 Marks
Total : 150 Marks
Duration of Exam. : 3 Hrs.

Note: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

COURSE OBJECTIVE : The purpose of this course is to :

1. Acquaint the student in the basic economic concepts and their operational significance and
2. Stimulate him to think systematically and objectively about contemporary economic problems.

Section -A

Definition of Economics - various definitions, Nature of Economic problem, Production possibility curve Economic laws and their nature. Relation between Science, Engineering, Technology and Economics.

Concepts and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility - its practical application and importance.

Section -B

Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve, Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & applications of the concept of elasticity of demand.

Section -C

Meaning of production and factors of production; Law of variable proportions, Returns to scale, Internal and External economies and diseconomies of scale. Various concepts of cost - Fixed cost, variable cost, average cost, marginal cost, money cost, real cost opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

Meaning of Market, Types of Market - Perfect Competition, Monopoly, Oligopoly, Monopolistic Competition (Main features of these markets)

Section -D

Supply and Law of Supply, Role of Demand & Supply in Price Determination and effect of changes in demand and supply on prices.

Nature and characteristics of Indian economy (brief and elementary introduction), Privatization - meaning, merits and demerits.

Globalisation of Indian economy - merits and demerits. Elementary Concepts of VAT, WTO, GATT & TRIPS agreement.

Books Recommended:**Text Books:**

1. Principles of Economics : P.N. Chopra (Kalyani Publishers).
2. Modern Economic Theory – K.K. Dewett (S.Chand)

Reference Books:

1. A Text Book of Economic Theory Stonier and Hague (Longman's Landon)
2. Micro Economic Theory – M.L. Jhingan (S.Chand)
3. Micro Economic Theory - H.L. Ahuja (S.Chand)
4. Modern Micro Economics : S.K. Mishra (Pragati Publications)
5. Economic Theory - A.B.N. Kulkarni & A.B. Kalkundrikar (R.Chand & Co.)
6. Indian Economy : Rudar Dutt & K.P.M. Sundhram

Data Structures & Algorithms Lab

L T P
- - 3

Class Work : 50 Marks
Exam : 50 Marks
Total 100 Marks:

Duration of Exam 3 Hrs.

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concepts write programs for finding the element in the array using Binary search Method
3. Write a program to perform following operations on tables using functions only
a) Addition b) Subtraction c) Multiplication d) Transpose
4. Using iteration & recursion concepts write the programs for Quick Sort Technique
5. Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
6. Write a program for swapping of two numbers using 'call by value' and 'call by reference strategies.
7. Write a program to implement binary search tree. (Insertion and Deletion in Binary search Tree)
8. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list
9. Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file.
10. Create a linked list and perform the following operations on it
a) add a node b) Delete a node
11. Write a program to simulate the various searching & sorting algorithms and compare their timings for a list of 1000 elements.
12. Write a program to simulate the various graph traversing algorithms.
13. Write a program which simulates the various tree traversal algorithms.

Note:.

At least 5 to 10 more exercises to be given by the teacher concerned.

L T P

- - 4

Class Work : 50 Marks

Exam : 50 Marks

Total : 100 Marks

Duration of Exam : 3 Hrs

Q1. Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called `power()` that takes a double value for n and an int value for p , and returns the result as double value. Use a default argument of 2 for p , so that if this argument is omitted, the number will be squared. Write a main `()` function that gets values from the user to test this function.

Q2. A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y coordinates.

Write a program that uses a structure called `point` to model a point. Define three points, and have the user input values to two of them. Then set the third point equal to the sum of the other two, and display the value of the new point. Interaction with the program might look like this:

Enter coordinates for P1: 3 4

Enter coordinates for P2: 5 7

Coordinates of P1 + P2 are : 8, 11

Q 3. Create the equivalent of a four function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally, it should display the result.

When it finishes the calculation, the program should ask if the user wants to do another calculation. The response can be 'Y' or 'N'. Some sample interaction with the program might look like this.

Enter first number, operator, second number: 10/ 3

Answer = 3.333333

Do another (Y/N)? Y

Enter first number, operator, second number 12 + 100

Answer = 112

Do another (Y/N) ? N

Q4. A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of a phone number separately. Call the structure `phone`. Create two structure variables of type `phone`. Initialize one, and have the user input a number for the other one. Then display both numbers. The interchange might look like this:

Enter your area code, exchange, and number: 415 555 1212

My number is (212) 767-8900

Your number is (415) 555-1212

Q 5. Create two classes `DM` and `DB`, which store the value of distances. `DM` stores distances in meters and centimeters and `DB` in feet and inches. Write a program that can read values for the class objects and add one object of `DM` with another object of `DB`.

Use a friend function to carry out the addition operation. The object that stores the results maybe a `DM` object or `DB` object, depending on the units in which the results are required. The display should be in the format of feet and inches or metres and centimetres depending on the object on display.

Q 6. Create a class `rational` which represents a numerical value by two double values- `NUMERATOR` & `DENOMINATOR`. Include the following public member Functions:

- constructor with no arguments (default).
- constructor with two arguments.

- void reduce() that reduces the rational number by eliminating the highest common factor between the numerator and denominator.
- Overload + operator to add two rational number.
- Overload >> operator to enable input through cin.
- Overload << operator to enable output through cout.

Write a main () to test all the functions in the class.

Q 7. Consider the following class definition

```
class father {
    protected : int age;
public:
    father (int x) {age = x;}
    virtual void iam ()
    { cout << "I AM THE FATHER, my age is : "<< age<< endl;}
};
```

Derive the two classes son and daughter from the above class and for each, define iam () to write our similar but appropriate messages. You should also define suitable constructors for these classes. Now, write a main () that creates objects of the three classes and then calls iam () for them. Declare pointer to father. Successively, assign addresses of objects of the two derived classes to this pointer and in each case, call iam () through the pointer to demonstrate polymorphism in action.

Q 8. Write a program that creates a binary file by reading the data for the students from the terminal. The data of each student consist of roll no., name (a string of 30 or lesser no. of characters) and marks.

Q 9. A hospital wants to create a database regarding its indoor patients. The information to store include

- Name of the patient
- Date of admission
- Disease
- Date of discharge

Create a structure to store the date (year, month and date as its members). Create a base class to store the above information. The member function should include functions to enter information and display a list of all the patients in the database. Create a derived class to store the age of the patients. List the information about all the to store the age of the patients. List the information about all the pediatric patients (less than twelve years in age).

Q 10. Make a class **Employee** with a name and salary. Make a class **Manager** inherit from **Employee**. Add an instance variable, named department, of type string. Supply a method to **toString** that prints the manager's name, department and salary. Make a class **Executive** inherit from **Manager**. Supply a method **toString** that prints the string "**Executive**" followed by the information stored in the **Manager** superclass object. Supply a test program that tests these classes and methods.

Q11. Imagine a tollbooth with a class called toll Booth. The two data items are a type unsigned int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both these to 0. A member function called payingCar () increments the car total and adds 0.50 to the cash total. Another function, called nopayCar (), increments the car total but adds nothing to the cash total. Finally, a member function called displays the two totals.

Include a program to test this class. This program should allow the user to push one key to count a paying car, and another to count a nonpaying car. Pushing the ESC key should cause the program to print out the total cars and total cash and then exit.

Q12. Write a function called reversit () that reverses a string (an array of char). Use a for loop that swaps the first and

last characters, then the second and next to last characters and so on. The string should be passed to reversit () as an argument.

Write a program to exercise reversit (). The program should get a string from the user, call reversit (), and print out the result. Use an input method that allows embedded blanks. Test the program with Napoleon's famous phrase, "Able was I ere I saw Elba".

- Q13. Create some objects of the string class, and put them in a Deque-some at the head of the Deque and some at the tail. Display the contents of the Deque using the `forEach()` function and a user written display function. Then search the Deque for a particular string, using the `firstThat()` function and display any strings that match. Finally remove all the items from the Deque using the `getLeft()` function and display each item. Notice the order in which the items are displayed: Using `getLeft()`, those inserted on the left (head) of the Deque are removed in “last in first out” order while those put on the right side are removed in “first in first out” order. The opposite would be true if `getRight()` were used.
- Q 14. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function `get data()` to initialize base class data members and another member function `display area()` to compute and display the area of figures. Make `display area()` as a virtual function and redefine this function in the derived classes to suit their requirements.

Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area. Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles and used as follows:

Area of rectangle = $x * y$

Area of triangle = $\frac{1}{2} * x * y$

CSHE-03-09-F Digital and Analog Circuits Laboratory

L T P
- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

1. Verification of Boolean Theorems - Implementation of Boolean Function - Adders / Subtractors - Decoders Encoders - Multiplexer - Demultiplexers - Comparators - Parity Checker/Generator.
2. Register Counters - Shift Registers - General-purpose shift registers - Data transmission.
3. Project - A mini project involving clocked sequential networks design.
4. To see the working of a BCD-to-7 Segment decoder and to verify the truth table.
5. To study the operation of Arithmetic and logic unit using 74181 IC.
6. To study the ckt. Of 16 line-to-1 line Multiplexer using 74150 and 7493IC, s with DEMO board.
7. To construct different types of flip-flops and verify their truth tables. Flip-flops like J-K flip-flops. S-R flip-flop. And D-flip-flops etc.
8. To construct and verify a Master-Slave flip-flop.
9. Construction and study of Modulo-N counter using IC's 7490 decade counter, 7493 binary counter.
10. Study of various Interfacing card Stepper motor with voluntary unit. 12-bit high-speed data acquisition card. PC Bus Extension unit. 16-bit channel Relay output card. Digital IC tester. 7-Segment display card. Amplifier and multiplexer card. IEEE 488 GPIB card. Digital I/O and timer counter card.
11. EPROM Programming
12. Study & working of DMA controller.
13. Designing of Traffic control system.

CSHE-04-01-F Micro-Processor and Programming

L T P	Class Work	:	50 Marks
4 1 -	Exam	:	100 Marks
	Total	:	150 Marks
	Duration of Exam	:	3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions

SECTION A

Introduction: Microcomputer structure and Operation, Microprocessor Evolution and types, The 8086 Microprocessor Family- Overview, Architecture of processor 8085 and 8086. Assembly Language Programming: Introduction to 8085 and 8086, Programming Development steps, Constructing machine Development codes for 8085 and 8086 instructions, Assembly Language Program Development Tools, Implementation of 8086

SECTION B

Assembly Language: Simple sequence program Jumps, Flags, and Conditional jumps, Loops and Constructs, Instruction Timing and Delay Loops Strings, Procedure and Macros: String instructions, Writing and Using Procedures, Writing and using Assembler Macros Instruction Description and Assembler Directives: Instruction Descriptions, Assembler Directives Systems Connections, Timing and Trouble Shooting: Basic 8086 Microcomputer systems connections, logic Analyzer to Observe Microprocessor Bus Signals, Troubleshooting a Simple 8086-Based Microcomputer Interrupts: 8086 Interrupts and Types, 8254 Software-Programmable Timer/Counter, 8259A Priority Interrupt Controller, Software Interrupt Applications

SECTION C

Digital and Analog Interfacing: Programmable Parallel Ports and Handshake Input/Output, Interfacing Keyboards and Alphanumeric Displays, Interfacing Microcomputer Ports to Devices, Developing the Prototype of a Microcomputer Based Instrument Memories, Coprocessors, and EDA Tools: 8086 Maximum Mode and DMA Data Transfer, Interfacing and Refreshing Dynamic RAMs, A Coprocessor- The 8087 Math Coprocessor, Computer Based Design and development Tools

SECTION D

Case studies: Multi-user/Multitasking OS, Concepts, 80286 Microprocessor, 80386 Microprocessor, 80486 Microprocessor.

BOOKS RECOMMENDED

- 1. Hall Douglas V, “Microprocessors and Interfacing”, Tata McGraw-Hill 1989.**
- 2. Berry B Brey ,“The Intel Microprocessors: 8086/8088, 80186/80188, 80286, 80386 And 80486, Pentium and Pentium ProProcessor Architecture, Programming and Interfacing”, Pearson Education 2003.**
- 3. Mathur Aditya P, “Introduction to Microprocessors” Tata McGraw-Hill 1989.**
- 4. Ray A Kbhurchandi, K M, “Advanced microprocessors and peripherals“,Tata McGraw Hill 2000.**
- 5. James L Antonakos, “An Introduction to the Intel Family of Microprocessors: A Hands-On Approach Utilizing the 80x86 Microprocessor Family”, First Edition. Cengage Learning, New Delhi**

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions

SECTION A

Data Transmission/The Physical Layer: Concepts and Terminology, Analog and Digital Data Transmission, Transmission Impairments, Guided Transmission Media, Wireless Transmission, Communication Satellites, The Public Switched Telephone Network, The Mobile Telephone System, Cable Television

Data Encoding: Digital Data: Digital and Analog Signals, Analog Data: Digital and Analog Signals, Spread Spectrum
Data Communication Interface: Asynchronous and Synchronous Transmission, Line Configurations, Interfacing

SECTION B

Multiplexing: Frequency-Division Multiplexing, Synchronous Time-Division Multiplexing, Statistical Time-Division Multiplexing
Circuit Packet and Switching: Switched Networks, Circuit-Switching Networks, Switching Concepts, Routing in Circuit-Switched Networks, Control Signaling, Packet-Switching Principles, Routing, Congestion Control, X.25 282

Frame Relay: Frame Relay Protocol Architecture, Frame Relay Call Control, User Data Transfer, Network Function, Congestion Control

SECTION C

LAN Technology and Systems: LAN Architecture, Bus/Tree LANs, Ring LANs, Star LANs, Wireless LANs, Ethernet and Fast Ethernet (CSMA/CD), Token Ring and FDDI, 100VG-AnyLAN, ATM LANs, Fiber Channel, Wireless LANs, Bridge Operation, Routing with Bridges

SECTION D

Protocols and Architecture: Protocols, OSI, And TCP/IP Protocol Suite Examples of networks: Novell Netware, Arpanet, and Internet. Examples of Data Communication Services: X.25 Networks, Frame relay, Broad band ISDN and ATM. Physical Layer: Transmission media- Narrow band ISDN: Services-Architecture- Interface, Broad band ISDN and ATM- Virtual Circuits versus Circuit Switching -Transmission in ATM networks. FDDI Link Layer and Local Area Networks Data link layer: Service provided by data link layer-Error detection and correction Techniques-Elementary data link layer protocols -Sliding Window protocols - Data link layer in HDLC, Internet and ATM . Multiple Access protocols: Channel partitioning protocols: TDM-FDM-Code Division Multiple Access (CDMA) .Random Access protocols: ALOHAC/CSMA and CSMA/CD. Local area Network: LAN addresses- Address Resolution Protocol-Reverse Address Resolution Protocol. Ethernet: Ethernet Technologies-IEEE standards- Hubs-Bridges and Switches

BOOKS RECOMMENDED

1. Andrew S. Tanenbaum "Computer Networks" Ed Pearson Education 4th Edition, 2003.
2. James F. Kurose and Keith W. Ross "Computer Networking" Pearson Education, 2002.
3. William Stalling, "Data and Computer Communication", Pearson Education, 7th Edition, 2nd Indian Reprint 2004.
4. Miller "Data and Network Communication" Ed Thomson Learning, 2001.
5. Douglas E Comer, "Computer Networks and Internets", Pearson Education 2nd Edition, 5th Indian Reprint 2001.

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions

SECTION A

SEMICONDUCTOR DIODE:

P-N junction and its V-I Characteristics, P-N junction as a rectifier, switching characteristics of Diode.

DIODE CIRCUITS:

Diode as a circuit element, the load-line concept, half-wave and full wave rectifiers, clipping circuits, clamping circuits, filter circuits, peak to peak detector and voltage multiplier circuits.

SECTION B

TRANSISTOR AT LOW FREQUENCIES:

Bipolar junction transistor : operation, characteristics, Ebers-moll model of transistor, hybrid model, h-parameters (CE, CB, CC configurations), analysis of a transistor amplifier circuits using h-parameters, emitter follower, Miller's Theorem, frequency response of R-C coupled amplifier.

TRANSISTOR BIASING:

Operating point, bias stability, collector to base bias, self-bias, emitter bias, bias compensation, thermistor & sensistor compensation.

SECTION C

TRANSISTOR AT HIGH FREQUENCIES:

Hybrid P model, CE short circuit current gain, frequency response, alpha, cutoff frequency, gain bandwidth product, emitter follower at high frequencies.

FIELD EFFECT TRANSISTORS:

Junction field effect transistor, pinch off voltage, volt-ampere characteristics, small signal model, MOSFET Enhancement & Depletion mode, V-MOSFET. Common source amplifier, source follower, biasing of FET, applications of FET as a voltage variable resistor (V V R).

SECTION D

REGULATED POWER SUPPLIES:

Series and shunt voltage regulators, power supply parameters, three terminal IC regulators, SMPS.

TEXT BOOK:

1. Integrated Electronics: Millman & Halkias ; McGrawHill
2. Electronic circuit analysis and design (Second edition): D.A.Neamen; TMH

REFERENCE BOOKS:

1. Electronics Principles: Malvino ; McGrawHill
2. Electronics Circuits: Donald L. Schilling & Charles Belove ; McGrawHill
3. Electronics Devices & Circuits: Boylestad & Nashelsky ; Pearson.

Students will be required to attempt five questions in all.

L T P

Programming Languages

			Class Work	:	50 Marks
3	1	-	Exam	:	100 Marks
			Total		150 Marks:
			Duration of Exam :		3 Hrs.

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section -A

Introduction: Syntactic and semantic rules of a Programming language, Characteristics of a good programming language, Programming language translators compiler & interpreters , Elementary data types – data objects, variable & constants, data types, Specification & implementation of elementary data types, Declarations ,type checking & type conversions , Assignment & initialization, Numeric data types, enumerations, Booleans & characters.

Section -B

Structured data objects : Structured data objects & data types , specification & implementation of structured data types, Declaration & type checking of data structure ,vector & arrays, records Character strings, variable size data structures , Union, pointer & programmer defined data objects, sets, files.

Subprograms and Programmer Defined Data Types: Evolution of data type concept ,abstraction, encapsulation & information hiding , Subprograms ,type definitions, abstract data types.

Section -C

Sequence Control:Implicit & explicit sequence control ,sequence control within expressions, sequence control within statement, Subprogram sequence control: simple call return ,recursive subprograms, Exception & exception handlers, co routines, sequence control .

Data Control: Names & referencing environment, static & dynamic scope, block structure, Local data & local referencing environment, Shared data: dynamic & static scope. Parameter & parameter transmission schemes.

Section -D

Storage Management: Major run time elements requiring storage ,programmer and system controlled storage management & phases , Static storage management , Stack based storage management, Heap storage management ,variable & fixed size elements.

Programming Languages: Introduction to procedural, non-procedural ,structured, functional and object oriented programming language, Comparison of C & C++ programming languages.

Text Book:

- Programming languages Design & implementation by T.W. .Pratt, 1996, Prentice Hall Pub.
- Programming Languages – Principles and Paradigms by Allen Tucker & Robert Noonan, 2002, TMH,

Reference Books:

- Fundamentals of Programming languages by Ellis Horowitz, 1984, Galgotia publications (Springer Verlag),
- Programming languages concepts by C. Ghezzi, 1989, Wiley Publications.,
- Programming Languages – Principles and Pradigms Allen Tucker , Robert Noonan 2002, T.M.H.

Theory of Automata AND Computation

L T P
3 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total 150 Marks:
Duration of Exam : 3 Hrs.

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section -A

Finite Automata and Regular Expressions: Finite State Systems, Basic Definitions Non-Deterministic finite automata (NFA), Deterministic finite automata (DFA), Equivalence of DFA and NFA Finite automata with E-moves, Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa.

Introduction to Machines: Concept of basic Machine, Properties and limitations of FSM. Moore and mealy Machines, Equivalence of Moore and Mealy machines, Conversion of NFA to DFA by Arden's Method.

Section -B

Properties of Regular Sets: The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.

Grammars: Definition, Context free and Context sensitive grammar, Ambiguity regular grammar, Reduced forms, Removal of useless Symbols and unit production, Chomsky Normal Form (CNF), Griebach Normal Form (GNF).

Section -C

Pushdown Automata: Introduction to Pushdown Machines, Application of Pushdown Machines

Turing Machines: Deterministic and Non-Deterministic Turing Machines, Design of T.M, Halting problem of T.M., PCP Problem.

Section -D

Chomsky Hierarchies: Chomsky hierarchies of grammars, Unrestricted grammars, Context sensitive languages, Relation between languages of classes.

Computability: Basic concepts, Primitive Recursive Functions.

Text Book:

- Introduction to automata theory, language & computations- Hopcroft & O.D.Ullman, R Mothwani, 2001,
AW

Reference Books:

- Theory of Computer Sc.(Automata, Languages and computation):K.L.P.Mishra & N.Chandrasekaran, 2000, PHI.
- Introduction to formal Languages & Automata-Peter Linz, 2001, Narosa Publ..
- Fundamentals of the Theory of Computation- Principles and Practice by RamondGreenlaw and H. James Hoover, 1998, Harcourt India Pvt. Ltd..
- Elements of theory of Computation by H.R. Lewis & C.H. Papaditriou, 1998, PHI.
- Introduction to languages and the Theory of Computation by John C. Martin 2003, T.M.H.

CSHE-04-06-F

Internet Fundamentals

L T P

3 1 -

Class Work	:	50 Marks
Exam	:	100 Marks
Total		150 Marks:
Duration of Exam	:	3 Hrs.

Note: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section -A

Electronic Mail: Introduction, advantages and disadvantages, Userids, Pass words, e-mail addresses, message components, message composition, mailer features, E-mail inner workings, E-mail management, Mime types, Newsgroups, mailing lists, chat rooms.

The Internet: Introduction to networks and internet, history, Working of Internet, Internet Congestion, internet culture, business culture on internet. Collaborative computing & the internet. Modes of Connecting to Internet, Internet Service Providers(ISPs), Internet address, standard address, domain name, DNS, IP.v6.Modems and time continuum, communications software; internet tools.

Section -B

World Wide Web : Introduction, Miscellaneous Web Browser details, searching the www: Directories search engines and meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP.

Introduction to Browser, Coast-to-coast surfing, hypertext markup language, Web page installation, Web page setup, Basics of HTML & formatting and hyperlink creation. Using FrontPage Express, Plug-ins.

Section -C

Languages: Basic and advanced HTML, java script language, Client and Server Side Programming in java script. Forms and data in java script, XML basics.

Section -D

Servers : Introduction to Web Servers: PWS, IIS, Apache; Microsoft Personal Web Server. Accessing & using these servers.

Privacy and security topics: Introduction, Software Complexity, Encryption schemes, Secure Web document, Digital Signatures, Firewalls.

Text Book:

- Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, TMH
- Internet & World Wide Programming, Deitel,Deitel & Nieto, 2000, Pearson Education

Reference Books:

- Complete idiots guide to java script,. Aron Weiss, QUE, 1997
- Network firewalls, Kironjeet syan -New Rider Pub.
- www.secnf.com
- www.hackers.com
- Alfred Gkossbrenner-Internet 101 Computing MGH, 1996

CSHE-04-07-F Micro-Processor and Programming Laboratory

L T P
- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

I. Microprocessor 8086:

1. Introduction to MASM/TASM.
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters, Strings.

II. Interfacing:

1. 8259 – Interrupt Controller: Generate an interrupt using 8259 timer.
2. 8279 – Keyboard Display: Write a small program to display a string of characters.
3. 8255 – PPI: Write ALP to generate sinusoidal wave using PPI.
4. 8251 – USART: Write a program in ALP to establish Communication between two processors.

III. Microcontroller 8051

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

L T P
- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

LIST OF EXPERIMENTS:

1. Study of Half wave & full wave rectifiers.
2. Study of power supply filters.
3. Study of Diode as clipper & clamper.
4. Study of Zener diode as a voltage regulator.
5. Study of CE amplifier for voltage, current & Power gains and input, output impedances..
6. Study of CC amplifier as a buffer.
7. To study the frequency response of RC coupled amplifier.
8. Study of 3-terminal IC regulator.
9. Study of transistor as a constant current source in CE configuration.
10. Study of FET common source amplifier.
11. Study of FET common Drain amplifier.
12. Graphical determination of small signal hybrid parameters of bipolar junction transistor.
13. Study & design of a d.c. voltage doubler.

NOTE : At least ten experiments are to be performed, atleast seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

CSHE-04-09-F

Internet Lab

L T P
- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

Exercises involving:

- Sending and receiving mails.
- Chatting on the net.
- Using FTP and Tel net server.
- Using HTML Tags (table, form, image, anchor etc.).
- Making a Web page of your college using HTML tags.

Note:

At least 10 exercise to be given by the teacher concerned.

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions

SECTION A

Probability: The concept of probability, The axioms of probability, Some important theorems on Probability, Assignment of Probabilities, Conditional Probability, Theorems on conditional probability, Independent Event's, Bayes' Theorem.

Random Variables and Probability Distributions: Random variables, Discrete probability distributions, Distribution functions for discrete random variables, Continuous probability distribution, Distributions for continuous random variables, joint distributions, Independent random variables.

SECTION B

Mathematical Expectation: Definition, Functions of random variables, some theorems on Expectation, The variance and Standard Deviation, Moments, Moment Generating Functions, Covariance, Correlation Coefficient.

Special Probability Distributions: The Binomial Distribution, The Normal Distribution, The Poisson Distribution, Relations between different distribution, Central limit theorem, Uniform distribution, Chi-square Distribution, Exponential distribution.

SECTION C

Sampling Theory: Population and Sample, Sampling with and without replacement, the sample mean, Sampling distribution of means, proportions, differences and sums, The sample variance, the sample distribution of variances.

Tests of Hypotheses and Significance: Statistical Decisions, Statistical hypotheses, Null Hypotheses, Tests of hypotheses and significance, Type I and Type II errors, level of significance, Tests involving the Normal distribution, One-Tailed and Two-tailed tests, Special tests of significance for large and small samples, The Chi-square test for goodness of fit.

SECTION D

Curve Fitting Regression and Correlation: Curve Fitting, The method of least squares, The least squares line, multiple regression, the linear correlation coefficient, Rank correlation, Probability interpretation of regression and correlation.

Discrete-Parameter Markov Chains: Introduction, Computation of n-step Transition Probabilities, State Classification and Limiting Distributions, Distribution of times between state changes, Irreducible finite chains with aperiodic states, The M/G/1 Queuing System, Discrete-parameter, Birth-Death processes, Finite Markov chains with absorbing states.

BOOKS RECOMMENDED

1. Murray R. Spiegel, "Probability and Statistics", McGrawHill, Schaum's Outline Series (Chapters: 1,2,3,4,5,7,8)
2. Kishor S Trivedi, "Probability and Statistics with Reliability, Queuing and Computer Applications", Prentics Hall of India, 2000 (Chapter 7)
3. A. Papoulis and S. Unnikrishna Pillai, "Probability, Random Variables and Stochastic Processes, McGraw Hill, 4th Edition
4. Richard A Johnson, Probability and Statistics for Engineers. Prenticshall, India, 2002.
5. Mondenhall, "Introduction to probability and statistics", Cengage Learning, New Delhi

CSHE-05-02-F

MOS ICs and Technology

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions

SECTION A

REVIEW OF MOS TECHNOLOGY :

Introduction to IC technology, MOS Transistor enhancement mode and depletion mode operations, fabrication of NMOS, CMOS and BiCMOS devices. Equivalent circuit for MOSFET and CMOS.

SECTION B

OS TRANSISTOR THEORY:

MOS device design equations, MOS transistor, Evaluation aspects of MOS transistor, threshold voltage, MOS transistor transconductance & output conductance, figure of merit, determination of pull-up to pull-down ratio for an n-MOS inverter driven by another n-MOS inverter & by one or more pass transistor, alternative forms of pull-up, CMOS and BiCMOS-inverters. Latch up in CMOS circuitry and BiCMOS Latch up susceptibility.

SECTION C

MOS CIRCUITS AND LOGIC DESIGN :

Basic physical design of simple logic gates using n-MOS, p-MOS and CMOS, CMOS logic gate design considerations, CMOS logic structures, clocking strategies.

CIRCUIT CHARACTERIZATION AND PERFORMANCE ESTIMATION :

Resistance estimation, capacitance estimation, inductance, switching characteristics, CMOS gate transistor sizing, power dissipation.

SECTION D

VLSI FABRICATION :

Crystal growth, wafer preparation, epitaxy, oxidation, lithography, etching, diffusion, dielectric and polysilicon film deposition, ion implantation, yield and reliability, metalization.

DESIGN EXAMPLE USING CMOS :

Incrementer / decrementer, left/right shift serial/parallel register, comparator for two n-bit number, a two-phase non-overlapping clock generator with buffered output on both phases, design of an event driven element for EDL system

TEXT BOOKS :

1. Introduction to Digital Integrated Circuits : Rabaey, Chandrakasan & Nikolic.
2. Principles of CMOS VLSI Design : Neil H.E. Weste and Kamran Eshraghian; Pearson.

REFERENCE BOOKS :

1. Introduction to Digital Circuits : Rabaey and ..LPE (PH)
2. : S.K.Gandhi.
3. VLSI Technology: S.M. Sze; McGraw-Hill.
4. Integrated Circuits: K.R. Botkar; Khanna

NOTE: Eight questions are to be set atleast one from each unit. Students have to attempt any five questions

Principle of Operating System

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section -A

Introduction:Introduction to Operating System Concepts (including Multitasking, multiprogramming, multi user, Multithreading etc)., Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.

Section -B

Process Management: Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms -First Come First Serve (FCFS), Shortest-Job-First (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling.

Memory Management: Logical & Physical Address Space, swapping, contiguous memory allocation,non-contiguous memory allocation paging and segmentation techniques, segmentation with paging; virtual memory management - Demand Paging & Page-Replacement Algorithms; Demand Segmentation.

Section -C

File System: Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms, Introduction to distributed file system.

Process-Synchronization & Deadlocks:Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, avoidance & detection; deadlock recovery.

Section -D

I/O Systems: I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Performance Issues.

Unix System And Windows NT Overview

Unix system call for processes and file system management, Shell interpreter, Windows NT architecture overview,Windows NT file system.

Text Books:

- Operating System Concepts by Silberchatz et al, 5th edition, 1998, Addison-Wesley.
- Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
- Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall

Reference Books:

- Operating System By Peterson , 1985, AW.
- Operating System By Milankovic, 1990, TMH.
- Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH.
- Operating Systems by Mandrik & Donovan, TMH
- Operating Systems By Deitel, 1990, AWL.
- Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003, T.M.H

CSHE-05-04-F

Computer Graphics

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section -A

Introduction to Computer Graphics: What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, mid point circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm.

Two/Three Dimensional Viewing: The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck).

Section -B

Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation.

Three-dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

Section -C

Viewing in 3D: Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.

Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm.

Section -D

Representing Curves and Surfaces: Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method.

Illumination, shading, image manipulation: Illumination models, shading models for polygons, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images.

Text Books:

- Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addison Wesley.
- Computer Graphics by Donald Hearn and M. Pauline Baker, 2nd Edition, 1999, PHI

Reference Books:

- Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition
- Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999, Addison Wesley.
- Computer Graphics: Secrets and Solutions by Corrign John, BPB
- Graphics, GUI, Games & Multimedia Projects in C by Pilaian & Mahendra, Standard Publ.
- Computer Graphics Secrets and solutions by Corrign John, 1994, BPV
- Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

CSHE-05-05-F

Analysis and Design of Algorithms

L T P

4 1 -

Class Work : 50 Marks

Exam : 100 Marks

Total : 150 Marks

Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section -A

Brief Review of Graphs, Sets and disjoint sets, union, sorting and searching algorithms and their analysis in terms of space and time complexity.

Divide and Conquer: General method, binary search, merge sort, quick sort, selection sort, Strassen's matrix multiplication algorithms and analysis of algorithms for these problems.

Section -B

Greedy Method: General method, knapsack problem, job sequencing with dead lines, minimum spanning trees, single source paths and analysis of these problems.

Dynamic Programming: General method, optimal binary search trees, 0/1 knapsack, the traveling salesperson problem.

Section -C

Back Tracking: General method, 8 queen's problem, graph colouring, Hamiltonian cycles, analysis of these problems.

Branch and Bound: Method, 0/1 knapsack and traveling salesperson problem, efficiency considerations. Techniques for algebraic problems, some lower bounds on parallel computations.

Section -D

NP Hard and NP Complete Problems: Basic concepts, Cook's theorem, NP hard graph and NP scheduling problems some simplified NP hard problems.

Text Books:

- Fundamental of Computer algorithms, Ellis Horowitz and Sartaj Sahni, 1978, Galgotia Publ.,
- Introduction To Algorithms, Thomas H Cormen, Charles E Leiserson And Ronald L Rivest: 1990, TMH

Reference Books:

- The Design and Analysis of Computer Algorithm, Aho A.V. Hopcroft J.E., 1974, Addison Wesley.
- Algorithms-The Construction, Proof and Analysis of Programs, Berlion, P.Bizard, P., 1986. Johan Wiley & Sons,
- Writing Efficient Programs, Bentley, J.L., PHI
- Introduction to Design and Analysis of Algorithm, Goodman, S.E. & Hedetniemi, 1997, MGH.
- Introduction to Computers Science- An algorithms approach , Jean Paul Trembley, Richard B.Bunt, 2002, T.M.H.
- Fundamentals of Algorithms: The Art of Computer Programming Voll, Knuth, D.E.: 1985, Naresh Publ.

CSHE-05-06-F

Web Development

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section -A

Introduction to the Internet, The world wide web: The idea of hypertext and hyper media; How the web works-HTTP, HTML and URLs; How the browser works-MIME types, plugins and helper applications; The standards-HTML, XML, XHTML and the W3C.

Section -B

Hypertext markup language: The anatomy of an HTML document; Marking up for structure and style: basic page markup, absolute and relative links, ordered and unordered lists, embedding images and controlling appearance, table creation and use, frames, nesting and targeting.
Descriptive markup: Meta tags for common tasks, semantic tags for aiding search, the doubling code and RDF.

Separating style from structure with style sheets: Internal style specifications within HTML, External linked style specification using CSS, page and site design considerations.

Section -C

Client side programming: Introduction to the JavaScript syntax, the JavaScript object model, Event handling, Output in JavaScript, Forms handling, miscellaneous topics such as cookies, hidden fields, and images; Applications.

Server side programming: Introduction to Server Side Technologies CGI/ASP/JSP., Programming languages for server Side Scripting, Configuring the server to support CGI, applications; Input/ output operations on the WWW, Forms processing, (using PERL/VBSCRIPT/JavaSCRIPT)

Section -D

Other dynamic content technologies: introduction to ASP & JSP, Delivering multimedia over web pages, The VRML idea, The Java phenomenon-applets and servlets, issues and web development.

Introduction to Microsoft .NET Technology and its comparison with the competing Technologies.

Text books:

- Beginning XHTML by Frank Boumperry, Cassandra Greer, Dave Raggett, Jenny Raggett, Sebastian Schnitzenbaumer & ted Wugofski, 2000, WROX press (Indian Shroff Publ. SPD) 1st edition
- HTML & XHTML: The Definitive Guide by Chuck Musciano, Bill Kennedy, 2000, 4th Edi.

Reference books:

- XHTML Black Book by Steven Holzner, 2000
- CGI Programming on the World Wide Web. O'Reilly Associates.
- Web Technologies By Achyut S Godbole , Atul Kahate, 2003, T.M.H
- Scott Guelich, Shishir Gundararam, Gunther Birzniek; CGI Programing with Perl 2/e O'Reilly.
- Doug Tidwell, James Snell, Pavel Kulchenko; Programming Web services, O'Reilly.
- Intranets by James D.Cimino, 1997, Jaico Publ.
- Internet and Web Technologies – Raj Kamal, 2002, T.M.H

L T P

- - 4

Class Work	:	50 Marks
Exam	:	50 Marks
Total	:	100 Marks
Duration of Exam	:	3 Hrs

List of Programs

1. Write a program for 2D line drawing as Raster Graphics Display.
2. Write a program for circle drawing as Raster Graphics Display.
3. Write a program for polygon filling as Raster Graphics Display
4. Write a program for line clipping.
5. Write a program for polygon clipping.
6. Write a program for displaying 3D objects as 2D display using perspective transformation.
7. Write a program for rotation of a 3D object about arbitrary axis.
8. Write a program for Hidden surface removal from a 3D object.

Note:

At least 5 to 10 more exercises to be given by the teacher concerned.

L T P

- - 4

Class Work	:	50 Marks
Exam	:	50 Marks
Total	:	100 Marks
Duration of Exam	:	3 Hrs

Java programs using classes & objects and various control constructs such as loops etc , and data structures such as arrays ,structures and functions.

Java programs for creating Applets for display of Images ,Texts and Animation

Programs related to interfaces & packages Input output & Random files programs in java

Java programs using Event driven concept Programs related to Network Programming Development of Web site for the college or newspaper agency.

Books recommended for Lab.

- Java Elements – Principles of Programming in Java , Duane A. Bailey , Duane W. Bailey, 2000, T.M.H
- The Java Handbook by Patrick Naughton, TMH, N.Delhi

L T P

- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

- Administration of WINDOWS 2000 (including DNS,LDAP, Directory Services)
- Study of LINUX Operating System (Linux kernel, shell, basic commands pipe & filter commands).
- Study of WINDOWS 2000 Operating System
- Administration of LINUX Operating System.
- Writing of Shell Scripts (Shell programming).
- AWK programming.

L T P	Class Work	:	50 Marks
4 1 -	Exam	:	100 Marks
	Total	:	150 Marks
	Duration of Exam	:	3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions

SECTION A

INTRODUCTION :

Introduction to Computer-aided design tools for digital systems. Hardware description languages; introduction to VHDL, data objects, classes and data types, Operators, Overloading, logical operators.Types of delays Entity and Architecture declaration. Introduction to behavioural, dataflow and structural models.

VHDL STATEMENTS :

Assignment statements, sequential statements and process, conditional statements, case statement Array and loops, resolution functions, Packages and Libraries, concurrent statements. Subprograms: Application of Functions and Procedures, Structural Modelling, component declaration, structural layout and generics.

SECTION B

COMBINATIONAL CIRCUIT DESIGN:

VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders, code converters, comparators, implementation of Boolean functions etc.

SEQUENTIAL CIRCUITS DESIGN :

VHDL Models and Simulation of Sequential Circuits Shift Registers, Counters etc.

SECTION C

DESIGN OF MICROCOMPUTER :

Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of a simple microcomputer system using VHDL

SECTION D

DESIGN WITH CPLDs AND FPGAs :

Programmable logic devices : ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs

REFERENCE BOOKS:

1. IEEE Standard VHDL Language Reference Manual (1993).
2. Digital Design and Modelling with VHDL and Synthesis : KC Chang; IEEE Computer Society Press.
3. "A VHDL Primmer : Bhasker; Prentice Hall 1995.
4. Digital System Design using VHDL : Charles. H.Roth ; PWS (1998).
5. "VHDL-Analysis & Modelling of Digital Systems : Navabi Z; McGraw Hill.
6. VHDL-IV Edition :Perry; TMH (2002)
7. Introduction to Digital Systems : Ercegovac. Lang & Moreno; John Wiley (1999).
8. Fundamentals of Digital Logic with VHDL Design : Brown and Vranesic; TMH (2000)
9. Modern Digital Electronics- III Edition: R.P Jain; TMH (2003).

NOTE : Eight questions are to be set - at least one question from each unit. Students will be required to attempt five questions in all.

Computer Networks

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, **Question No. 1** will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

OSI Reference Model and Network Architecture: Introduction to Computer Networks, Example networks ARPANET, Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular –Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer

Section B

TCP/IP: Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol , User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6.

Section C

Local Area Networks: Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.

Wide Area Networks: Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB), Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay.,Wireless Links.

Section D

Introduction to Network Management:Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000.

Text Book:

- Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

Reference Books:

- Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000, Addison Wesley, Low Price Edition.
- Business Data Communications, Fitzgerald Jerry,.
- Computer Networks – A System Approach, Larry L. Peterson & Bruce S. Davie, 2nd Edition
- Computer Networking – ED Tittel , 2002, T.M.H.

Multimedia Technology

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Basics of Multimedia Technology: Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD- Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools; LANs and multimedia; internet, World Wide Web & multimedia distribution network- ATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.

Section B

Image Compression & Standards: Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.

Section C

Audio & Video: Digital representation of sound; time domain sampled representation; method of encoding the analog signals; subband coding; fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadrasonic signal processing; editing sampled sound; MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.

Section D

Virtual Reality: Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems. Applications of environment in various fields.

Text Books:

- An introduction, Villamil & Molina, Multimedia Mc Milan, 1997
- multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

Reference Books:

- Multimedia: Production, planning and delivery, Villamil & Molina,Que, 1997
- Multimedia on the PC, Sinclair,BPB
- Multimedia: Making it work, Tay Vaughan, fifth edition, 1994, TMH.
- Multimedia in Action by James E Shuman, 1997, Wadsworth Publ.,
- Multimedia in Practice by Jeff coate Judith, 1995,PHI.
- Multimedia Systems by Koegel, AWL
- Multimedia Making it Work by Vaughan, etl.
- Multimedia Systems by John .F. Koegel, 2001, Buford.
- Multimedia Communications by Halsall & Fred, 2001,AW.

Principle of Software Engineering

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Introduction:The process, software products, emergence of software engineering, evolving role of software, software life cycle models, Software Characteristics, Applications, Software crisis.

Software project management:Project management concepts, software process and project metrics Project planning, project size estimation metrics, project estimation Techniques, empirical estimation techniques, COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management,project scheduling and tracking.

Section B

Requirements Analysis and specification requirements engineering, system modeling and simulation Analysis principles modeling, partitioning Software, prototyping: , Prototyping methods and tools; Specification principles, Representation, the software requirements specification and reviews Analysis Modeling: Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling; The mechanics of structured analysis: Creating entity/ relationship diagram, data flow model, control flow model, the control and process specification; The data dictionary; Other classical analysis methods.

Section C

System Design: Design concepts and principles: the design process: Design and software quality, design principles; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence,Cohesion, Coupling; Design Heuristics for effective modularity; The design model; Design documentation.

Architectural Design: Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs ,architectural complexity; Mapping requirements into a software architecture; Transform flow, Transaction flow; Transform mapping; Refining the architectural design.

Section D

Testing and maintenance: Software Testing Techniques, software testing fundamentals: objectives,principles, testability; Test case design, white box testing, basis path testing: Control structure testing: Black box testing, testing for specialized environments ,architectures and applications. Software Testing Strategies: Verification and validation, Unit testing, Integration testing,; Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, the debugging process debugging approaches. Software re-engineering , reverse engineering ,restructuring, forward engineering.

Software Reliability and Quality Assurance :Quality concepts, Software quality assurance , SQA activities; Software reviews: cost impact of software defects, defect amplification and removal; formal technical reviews:The review meeting, review reporting and record keeping, review guidelines; Formal approaches to SQA; Statistical software quality assurance; software reliability: Measures of reliability and availability ,The ISO 9000 Quality standards: The ISO approach to quality assurance systems, The ISO

9001 standard, Software Configuration Management.

Computer Aided software Engineering: CASE, building blocks, integrated case environments and architecture, repository.

Text Book:

- Software Engineering – A Practitioner’s Approach, Roger S. Pressman, 1996, MGH.

Reference Books:

- Fundamentals of software Engineering, Rajib Mall, PHI
- Software Engineering by Ian Sommerville, Pearson Edu, 5th edition, 1999, AW,
- Software Engineering – David Gustafson, 2002, T.M.H
- Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995
JW&S,
- An Integrated Approach to software engineering by Pankaj Jalote , 1991 Narosa,

CSHE-06-05-F

Intelligent System

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Foundational issues in intelligent systems: Foundation and history of AI, Ai problems and techniques – AI programming languages, introduction to LISP and PROLOG- problem spaces and searches, blind search strategies, Breadth first- Depth first- heuristic search techniques Hill climbing: best first- A * algorithm AO* algorithm- game tree, Min max algorithms, game playing- alpha beta pruning.

Section B

Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems. Reasoning under uncertainty, review of probability, Baye's probabilistic interferences and Dempster shafer theory, Heuristic methods, symbolic reasoning under uncertainty, Statistical reasoning, Fuzzy reasoning, Temporal reasoning, Non monotonic reasoning.

Section C

Planning, planning in situational calculus, representation for planning, partial order planning algorithm, learning from examples, discovery as learning, I earning by analogy, explanation based learning, neural nets, genetic algorithms.

Section D

Principles of Natural language processing, rule based systems architecture, Expert systems, knowledge acquisition concepts, AI application to robotics, and current trends in intelligent systems.

Text Book:

- Artificial Intelligence: A Modern Approach,. Russell & Norvig. 1995, Prentice Hall.

Reference Books:

- Artificial Intelligence, Elain Rich and Kevin Knight, 1991, TMH.
- Artificial Intelligence-A modern approach, Staurt Russel and peter norvig, 1998, PHI.
- Artificial intelligence, Patrick Henry Winston:, 1992, Addition Wesley 3rd Ed.,

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Evolution of Components Systems Programming, Assemblers, Loaders, Linkers, Macros, Compilers. Software tools, Text editors, Interpreters and program generators, Debug Monitors, Programming environment.

Compiler: Brief overview of compilation process, Incremental compiler, Assembler: Problem statement, single phase and two phase assembler, symbol table; Loader schemes, compile and go Loader, general loader schemes, absolute loader, Subroutine linkage, Reallocating loader, Direct linkage Loader, Binders, Linking loader, overlays.

Section B

Macro language and macro-processor, macro instructions, features of macro facility, macro instruction arguments, conditional macro expansion, macro calls with macro instruction defining macros.

Theoretical Concept of Unix Operating System: Basic features of operating system; File structure: CPU scheduling; Memory management: swapping, demand paging; file system: block and fragments, inodes, directory structure; User to user communication.

Section C

Getting Started with Unix: User names and groups, logging in; Format of Unix commands; Changing your password; Characters with special meaning; Unix documentation; Files and directories; Current directory, looking at the directory contents, absolute and relative pathnames, some Unix directories and files; Looking at the file contents; File permissions; basic operation on files; changing permission modes; Standard files, standard output; Standard input, standard error; filters and pipelines; Processes; finding out about processes; Stopping background process; Unix editor vi.

Test Manipulation: Inspecting files; File statistics; Searching for patterns; Comparing files; Operating on files; Printing files; Rearranging files; Sorting files; Splitting files; Translating characters; AWK utility.

Section D

Shell Programming: Programming in the Bourne and C-Shell; Wild cards; Simple shell programs; Shell variables; Shell programming constructs; interactive shell scripts; Advanced features.

System Administration: Definition of system administration; Booting the system; Maintaining user accounts; File systems and special files; Backups and restoration; Role and functions of a system manager. Overview of the linux. operating system

Text Books:

- Systems Programming by Donovan, TMH.
- The unix programming environment by Brian Kernighen & Rob Pike, 1984, PHI & Rob Pike.
- Design of the Unix operating system by Maurich Bach, 1986, PHI.
- Introduction to UNIX and LINUX by John Muster, 2003, TMH.

Reference Book:

- Advanced Unix programmer's Guide by Stephen Prato, BPB
- Unix- Concept and applications by Sumitabha Das, 2002, T.M..H

L T P

- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

LIST OF EXPERIMENTS:

1. Design all gates using VHDL.
2. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
 - a. half adder
 - b. full adder
3. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
 - a. multiplexer
 - b. demultiplexer
4. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
 - a. decoder
 - b. encoder
5. Write a VHDL program for a comparator and check the wave forms and the hardware generated
6. Write a VHDL program for a code converter and check the wave forms and the hardware generated
7. Write a VHDL program for a FLIP-FLOP and check the wave forms and the hardware generated
8. Write a VHDL program for a counter and check the wave forms and the hardware generated
9. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
 - a. register
 - b. shift register
10. Implement any three (given above) on FPGA/CPLD kit

NOTE : Ten experiments are to be performed out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

L T P
- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

1. Write a program to justify a text entered by the user on both the left and right hand side. For example, the text “ An architect may have a graphics program to draw an entire building but be interested in only ground floor”, can be justified in 30 columns as shown below. An architect may have a Graphics programs draw an Entric building but be interested in only ground floor.
2. Study the notes of a piano and stimulate them using the key board and store them in a file.
3. Write a program to read a paragraph and store it to a file name suggested by the author.
4. Devise a routine to produce the animation effect of a square transforming to a triangle and then to a circle.
5. Write a program to show a bitmap image on your computer screen.
6. Create a web page for a clothing company which contains all the details of that company and at-least five links to other web pages.
7. Write a program by which we can split mpeg video into smaller pieces for the purpose of sending it over the web or by small capacity floppy diskettes and then joining them at the destination.
8. Write a program to simulate the game of pool table.
9. Write a program to simulate the game Mine Sweeper.
10. Write a program to play “wave” or “midi” format sound files.

Note

At least 5 to 10 more exercises to be given by the teacher concerned.

CSHE-06-09-F

Intelligent System Lab.

L T P

- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

1. Study of PROLOG.
Write the following programs using PROLOG.
2. Write a program to solve 8 queens problem.
3. Solve any problem using depth first search.
4. Solve any problem using best first search.
5. Solve 8-puzzle problem using best first search
6. Solve Robot (traversal) problem using means End Analysis.
7. Solve traveling salesman problem

NOTE:

At least 5 to 10 more exercises to be given by the teacher concerned.

L T P	Class Work	:	50 Marks
4 1 -	Exam	:	100 Marks
	Total	:	150 Marks
	Duration of Exam	:	3 Hrs

Note: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions

SECTION A

Introduction: Neural networks characteristics, History of development in neural networks principles, Artificial neural net terminology, Model of a neuron, Topology. \

Learning Methods & Neural network models: types of learning, Supervised, Unsupervised, Re-inforcement learning.

SECTION B

Knowledge, representation and acquisition. Basic Hop field model, Basic learning laws, Unsupervised learning, Competitive learning, K-means clustering algorithm, Kohonen`s feature maps.

SECTION C

Artificial Neural Networks: Radial basis function neural networks, Basic learning laws in RBF nets, Recurrent back propagation. Introduction to counter propagation networks, CMAC network, and ART networks.

SECTION C

Applications of neural nets: Applications such as pattern recognition, Pattern mapping, Associative memories, speech and decision-making.. Fuzzy Logic: Basic concepts of fuzzy logic, Fuzzy vs. Crisp set, Linguistic variables, Membership functions, Fuzzy sets & Operations of fuzzy sets, Fuzzy IF- THEN rules, Variable inference techniques, De-Fuzzification, Basic fuzzy inference algorithm, Fuzzy system design, Antilock Breaking system (ABS), Industrial applications.

Text Books:

1. B. Yegnanarayana, " Artificial Neural Networks"PHI
2. J.M. Zurada, "Introduction to artificial neural systems", Jaico Pub.
3. ROSS J.T , "Fuzzy logic with engineering application", TMH

Reference Books:

1. Simon Haykin, "Neural Networks", PHI
2. Ahmad M.Ibrahim, "Introduction to applied Fuzzy Electronics", (PHI)
3. P.D. wasserman , "Neural computing theory & practice", (ANZA PUB).

CSHE-07-02-F

Advanced Computer Architecture

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Architecture And Machines: Some definition and terms, interpretation and microprogramming. The instruction set, Basic data types, Instructions, Addressing and Memory. Virtual to real mapping. Basic Instruction Timing.

Time, Area And Instruction Sets: Time, cost-area, technology state of the Art, The Economics of a processor project: A study, Instruction sets, Professor Evaluation Matrix

Section B

Cache Memory Notion: Basic Notion, Cache Organization, Cache Data, adjusting the data for cache organization, write policies, strategies for line replacement at miss time, Cache Environment, other types of Cache. Split I and D-Caches, on chip caches, Two level Caches, write assembly Cache, Cache references per instruction, technology dependent Cache considerations, virtual to real translation, overlapping the Tcycle in V-R Translation, studies. Design summary.

Section C

Memory System Design: The physical memory, models of simple processor memory interaction, processor memory modeling using queuing theory, open, closed and mixed-queue models, waiting time, performance, and buffer size, review and selection of queuing models, processors with cache.

Section D

Concurrent Processors: Vector Processors, Vector Memory, Multiple Issue Machines, Comparing vector and Multiple Issue processors.

Shared Memory Multiprocessors: Basic issues, partitioning, synchronization and coherency, Type of shared Memory multiprocessors, Memory Coherence in shared Memory Multiprocessors.

Text Book:

- Advance computer architecture by Hwang & Briggs, 1993, TMH.

Reference Books:

- Pipelined and Parallel processor design by Michael J. Fiynn – 1995, Narosa.

CSHE-07-03-F

Software Project Management

L T P	Class Work	:	50 Marks
4 1 -	Exam	:	100 Marks
	Total	:	150 Marks
	Duration of Exam	:	3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Introduction to Software Project Management (SPM): Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, project as a system, management control, requirement specification, information and control in organization.

Stepwise Project planning:Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/ publicize plan.

Project Evaluation & Estimation: Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods, rapid application development, water fall-, V-process-, spiral- models. Prototyping, delivery. Albrecht function point analysis.

Section B

Activity planning & Risk Management: Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks.

Risk Management: Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values..

Resource allocation &Monitoring the control: Introduction, the nature of resources,identifying resource requirements, scheduling resources creating critical paths, counting the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence.

Section C

Monitoring the control: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control.

Managing contracts and people: Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures, conclusion, further exercises..

Section D

Software quality: Introduction, the place of software quality in project planning, the importance of software quality, defining software quality, ISO 9126, Practical software quality measures, product versus process quality management, external standards, techniques to help enhance software quality.

Study of Any Software Project Management software: viz Project 2000 or equivalent

Text Book:

- Software Project Management (2nd Edition), by Bob Hughes and Mike Cotterell, 1999, TMH

Reference Books:

- Software Engineering – A Practitioner’s approach, Roger S. Pressman (5th edi), 2001, MGH
- Software Project Management, Walker Royce, 1998, Addison Wesley.
- Project Management 2/c. Maylor
- Managing Global software Projects, Ramesh, 2001, TMH.

CSHE-07-04-F

Compiler Design

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Introduction To Compilers: Compilers and translators, need of translators, structure of compiler :its different phases, Compiler construction tools.

Lexical Analysis:Role of lexical analyzer, design of lexical analyzer, regular expressions , Specification and recognition of tokens, input buffering, A language specifying lexical analyzer. Finite automata, conversion from regular expression to finite automata, and vice versa, minimizing number of states of DFA, Implementation of lexical analyzer.

Section B

Syntax Analysis: Role of parsers, context free grammars, definition of parsing.

Parsing Technique:Shift- reduce parsing, operator precedence parsing, top down parsing, predictive parsing.

Section C

LR parsers, SLR, LALR and Canonical LR parser.

Syntax Directed Translations: Syntax directed definition, construction of syntax trees, syntax directed translation scheme, implementation of syntax directed translation, three address code, quadruples and triples.

Section D

Symbol Table & Error Detection And Recovery: Symbol tables, its contents and data structure for symbol tables; trees, arrays, linked lists, hash tables. Errors, lexical phase error, syntactic phase error, semantic error.

Code Optimization & Code Generation: Code generation, forms of objects code, machine dependent code, optimization, register allocation for temporary and user defined variables.

Text Books:

- Compilers Principle, Techniques & Tools - Alfred V. AHO, Ravi Sethi & J.D. Ullman; - 1998Addison Wesley.
- Compiler Design by O.G. Kakde, 1995, Laxmi Publ.

Reference Books:

- Theory and practice of compiler writing, Tremblay & Sorenson, 1985, Mc. Graw Hill.
- System software by Dhamdae, 1986, MGH.
- Principles of compiler Design, Narosa Publication

CSHE-07-06-F

COMPILER DESIGN LAB

L T P
- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

1. Practice of LEX/YACC of compiler writing.
2. Write a program to check whether a string belong to the grammar or not.
3. Write a program to generate a parse tree.
4. Write a program to find leading terminals.
5. Write a program to find trailing terminals.
6. Write a program to compute FIRST of non-terminal.
7. Write a program to compute FOLLOW of non-terminal
8. Write a program to check whether a grammar is left Recursion and remove left Recursion.
9. Write a program to remove left factoring.
10. Write a program to check whether a grammar is operator precedent.
11. To show all the operations of a stack.
12. To show various operations i.e. read, write and modify in a text file.

Note :

At least 10 programs are required to be developed in the semester.

CSHE-07-07-F

Visual Programming LAB

L T P
- - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

Study of Visual Basic 6.0.NET and Visual C++ 6.0.NET.

- 1.Study Windows API's. Find out their relationship with MFC classes. Appreciate how they are helpful in finding complexities of windows programming
- 2.Get familiar with essential classes in a typical (Document- view architecture) VC++ Program and their relationship with each other.
- 3.Create an SDI application in VC++ that adds a popup menu to your application which uses File drop down menu attached with the menu bar as the pop-up menu. The pop-up menu should be displayed on the right click of the mouse.
- 4.Create an SDI application in VC++ using which the user can draw atmost 20 rectangles in the client area. All the rectangles that are drawn should remain visible on the screen even if the window is refreshed. Rectangle should be drawn on the second click of the left mouse button out of the two consecutive clicks. If the user tries to draw more than 20 rectangles, a message should get displayed in the client area that “ No more rectangles can be drawn”
- 5.Create an application in VC++ that shows how menu items can be grayed, disabled and appended at run time.
- 6.Write a program in VC++ to implement serialization of inbuilt and user defined objects.
- 7.Write a program in VC++ to create archive class object from CFile class that reads and stores a simple structure (record).
- 8.Make an Active X control in VC++ derived from a standard control.
- 9.Write a program in VB to implement a simple calculator.
- 10.Create a simple database in MS Access Database /Oracle and a simple database application in VB that shows database connectivity through DAO and ADO.
- 11.Write a simple program that displays an appropriate message when the illegal operation is performed using error handling technique in VB.
- 12.Write a program in VB to create a notepad.
- 13.Create a DLL in VB.

Bright students may do the following exercises:

- 14.Write a program in VC++ to implement a simple calculator.
- 15.Write a program in VC++ to create a static link library and a dynamic link library.
- 16.Create a simple database in MS Access Database and a simple database application in VC++ that shows database connectivity through ADO model.
- 17.Make an Active X control of your own using VB.
- 18.With the help of VB, create an object of excel application and implement any action on it.

CSHE-08-01-F

Distributed Operating System

L T P	Class Work	:	50 Marks
4 1 -	Exam	:	100 Marks
	Total	:	150 Marks
	Duration of Exam	:	3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

SECTION-A:

Introduction: Introduction to Distributed System, Goals of Distributed system, Hardware and Software concepts, Design issues. Communication in distributed system: Layered protocols, ATM networks, Client – Server model, Remote Procedure Calls and Group Communication. Middleware and Distributed Operating Systems.

SECTION-B:

Synchronization in Distributed System: Clock synchronization, Mutual Exclusion, Election algorithm, the Bully algorithm, a Ring algorithm, Atomic Transactions, Deadlock in Distributed Systems, Distributed Deadlock Prevention, Distributed Deadlock Detection .

SECTION-C:

Processes and Processors in distributed systems: Threads, System models, Processors Allocation, Scheduling in Distributed System, Real Time Distributed Systems.

SECTION-D:

Distributed file systems: Distributed file system Design, Distributed file system Implementation, Trends in Distributed file systems.

Distributed Shared Memory: What is shared memory, Consistency models, Page based distributed shared memory, shared variables distributed shared memory.

Case study MACH: Introduction to MACH, process management in MACH, communication in MACH, UNIX emulation in MACH.

Text Book:

- Distributed Operating System – Andrew S. Tanenbaum, PHI.

CSHE-08-02-F

Advanced JAVA

L T P
4 1 -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

SECTION A:

CORE JAVA

Introduction to Java, Data types, variables, operators, Arrays, Control Statements, Classes & Methods, Inheritance, Exception Handling, Multithreading, Collections, I/O streams, AVVT & Apolet Programming.

NETWORKING

Connecting to a Server, Implementing Servers, Sending E-Mail, Making URL Connections, Advanced Socket Programming

SECTION B:

DATABASE NETWORKING

The Design of JDBC. The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Matadata, Row Sets, Transactions, Advanced Connection Management, Introduction of LDAP

DISTRIBUTED OBJECTS

The Roles of Client and Server, Remote Method Invocations, Setup for Remote Method Invocation, Parameter Passing in Remote Methods Server Object Activation, Java IDL and CCRA, Remote Method Calls with SOAP

SECTION C:

SWING

Lists, Trees, Tables, Styled Text Components, Progress Indicators, Component Organizers

AWT

The Rendering Pipeline, Shapes, Areas, Strokes, Paint, Coordinate Transformations, Clipping, Transparency and Composition, Rendering Hints, Readers and Writers for Images, Image Manipulation, Printing. The Clipboard, Drag and Drop

SECTION D:

JAVABEANS COMPONENTS

Beans, The Bean-Writing Process, Using Beans to Build an Application, Naming Patterns for Bean Components and Events Bean Property Tubes Beaninfo Classes Property Editors Cuatomizes

SECURITY

Class Loaders, Bytecode Verification, Security Managers and Permissions, Digital Signatures, Code Signing, Encryption

TEXT BOOK:

Core Java™ 2, Volume II-Advanced Features, 7th Edition by Cay Horetmann, Gary Cornelll Pearson Publisher, 2004

REFERENCE BOOKS:

1. Professional Java Programming by Brett Spell, WROX Publication
2. Advanced Java 2 Platform, How to Program, 2nd Edition, Harvey. M. Diatal, Prentice Hall

CSHE-08-05-F

Advanced Java Lab.

L T P
- - - 4

Class Work : 50 Marks
Exam : 50 Marks
Total : 100 Marks
Duration of Exam : 3 Hrs

Development of programs relating to :

- JDBC
- Servlets
- Beans
- RMI
- JSP

Network Security & Management

L T P

4 - -

Class Work	:	50 Marks
Exam	:	100 Marks
Total	:	150 Marks
Duration of Exam	:	3 Hrs.

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Introduction: Codes and Ciphers – Some Classifical systems – Statistical theory of cipher systems- Complexity theory of crypto systems – Stream ciphers, Block ciphers.

Stream Ciphers: Rotor based system – shift register based systems – Design considerations for stream ciphers – Cryptanalysis of stream ciphers – Combined eneryption and encoding. Block Ciphers – DES and variant, modes of use of DES.

Public key systems – Knacksack systems – RSK – Diffe Hellman Exchange – Authentication and Digital signatures, Elliptic curve based systems.

Section B

System Identification and clustering: Cryptology of speech signals – narrow band and wide band systems – Analogue & Digital Systems of speech encryption.

Section C

Security: Hash function – Authentication: Protocols – Digital Signature standards.

Electronics Mail Security – PGP (Pretty Good Privacy) MIME, data Compression technique.

IP Security: Architecture, Authentication Leader, Encapsulating security Payload – Key Management.

Web security: Secure Socket Layer & Transport Layer security, Secure electronics transactions.

Firewalls Design principle, established systems.

Section D

Telecommunication Network Architecture, TMN management layers, Management information Model, Management servicing and functions, Structure of management information and TMN information model, SNMP

v1, SNMP2 & SNMP3, RMON1 & 2, Broadband Network Management (ATM, HFC, DSL), ASN

Text Books:

- Cryptography and Network Security: Principles & Practices, 2nd Edition by Upper Saddle River, PHI
- Network Management Principles & Practices by Subramanian, Mani (AWL)
- SNMP, Stalling, William (AWL)

Reference Books:

- SNMP: A Guide to Network Management (MGH)
- Telecom Network Management by H.H. Wang (MGH)
- Network Management by U. Dlack (MGH)

L T P
4 - -

Digital Image Processing

Class Work	:	50 Marks
Exam	:	100 Marks
Total	:	150 Marks
Duration of Exam	:	3 Hrs.

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Introduction and Fundamental to Digital Image Processing: What is Digital Image

Processing, Origin of Digital Image Processing, Examples that use Digital Image Processing, Fundamental steps in

Digital Image Processing, Components of Digital Image Processing System, Image sensing and acquisition, Image

sampling, quantization and representation, Basic relationship between pixels.

Image Enhancement in the Spatial Domain & Frequency domain: Background, Basic

gray level transformation, Histogram processing, Basics of spatial filtering, Smoothing and Sharpening Spatial filters, Introduction to Fourier Transform and the Frequency Domain, Discrete Fourier Transform. Smoothing and

Sharpening Frequency-Domain filters.

Section B

Image Restoration: Image Degradation/Restoration Process, Noise models, Restoration in presence of noise, Inverse Filtering, Minimum Mean Square Filtering, Geometric mean filter, Geometric transformations.

Color Image Processing: Color Fundamentals, Color models, Basis of full color image processing, Color transformations.

Section C

Image Compression: Fundamentals, Image compression models, Error free compression, Lossy compression.

Image Segmentation:Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region oriented segmentation.

Section D

Representation, Description and Recognition: Representation-chain codes, polygonal approximation and skeletons, Boundary descriptors-simple descriptors, shape numbers, Regional descriptors-simple, topological descriptors, Pattern and Pattern classes-Recognition based on matching techniques.

Recognition: Pattern and pattern Classes, Decision-Theoretic Methods.

Text Book:

- Digital Image Processing by Rafael C.Gonzalez & Richard E. Woods –2002, Pearson Education

Reference Book:

- Digital Image Processing by A.K. Jain, 1995,-PHI

Advanced Database Management Systems

L	T	P	Class Work	:	50 Marks
4	-	-	Exam	:	100 Marks
			Total	:	150 Marks
			Duration of Exam	:	3 Hrs.

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Data Models: EER model and relationship to the OO model, Object Oriented data model and ODMG standard, Other data models - NIAM, GOOD, ORM.

Query Optimisation: Query Execution Algorithms, Heuristics in Query Execution, Cost Estimation in Query Execution, Semantic Query Optimisation.

Section B

Database Transactions and Recovery Procedures: Transaction Processing Concepts, Transaction and System Concepts, Desirable Properties of a Transaction, Schedules and Recoverability, Serializability of Schedules, Transaction Support in SQL, Recovery Techniques, Database Backup, Concurrency control, Locking techniques for Concurrency Control, Concurrency Control Techniques, Granularity of Data Items.

Client Server Computing: Client Server Concepts, 2-Tier and 3-Tier Client Server Systems, Client/Server Architecture and the Internet, Client /Database Server Models, Technology Components of Client Server Systems, Application Development in Client Server Systems.

Section C

Distributed Databases: Reliability and Commit protocols, Fragmentation and Distribution, View Integration,

Distributed database design, Distributed algorithms for data management, Heterogeneous and Federated Database

Systems.

Deductive Databases: Recursive Queries, Prolog/Datalog Notation, Basic inference Mechanism for Logic Programs, Deductive Database Systems, Deductive Object Oriented Database Systems.

Section D

Commercial and Research Prototypes: Parallel database, Multimedia database, Mobile database, Digital

libraries, Temporal database.

Text Book:

- Fundamentals of Database Systems (3 edition), Elmasri R. and Navathe S.B., 2000, Addison Wesley, Low Priced Edition.

Reference Book:

- Database System Concepts by A. Silbershatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition.

CSHE-08-04-1-F

Human Computer Interaction

L T P

4 - -

Class Work : 50 Marks

EXAM :

DURATION

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Introductions & overview of HCI.:

History of computer user interfaces, HCI - history and intellectual root

Human information processing limitations, human decision making.

1. Human cognitive and sensory limits
2. Human memory
3. Human problem solving
4. Skill acquisition
5. Users' conceptual models (mental models)
6. Decision making

Computer systems and user interfaces, human-system interaction:

- Input and output devices, Mechanics of particular devices, Speech input, sound and speech output, Computer architecture, Performance characteristics of humans and systems, Color issues, Computer graphics, Color representation, color maps, color range of devices

Section B

Interaction models and metaphors:

- Use of abstract metaphors for describing interface behavior, Use of metaphors to support user understanding, Dialog input and output techniques and purposes, Screen layout issues, Dialog interaction: types and techniques, navigation and orientation, multimedia and non-graphical dialogues, Dialog issues: response time, control, standards, look and feel, Layers model of architecture of design and windowing systems, Windows manager models, e.g., X, Macintosh, MS Windows, Hypermedia and WWW

Principles guiding well-designed human-system interaction:

- Paradigms for interaction, Principles to support usability, Accounting for users with disabilities

Section C

The design process – overview:

- The typical software development lifecycle (idealized vs. actual), User-centered design overview, “Three pillars of design”, Usability engineering overview, Reconciling UCD and usability testing

The design process - task and user needs analysis:

- Task analysis definition, Techniques for task analysis, Sources of information

The design process – making use of task and user data for system design.

- Use cases, scenarios, Structuring the information, Information architecture, User and process flows, Wireframes, Mockups, comps, Other methods of conveying structure and function

Section D

Designing for universal access:

- What is accessibility? What is accessible software, Examples of accessibility adaptations, What's driving software accessibility, Implications for software organizations

Speech user interfaces:

- Attributes of speech user interfaces, Evaluating speech user interface quality

HCI in mission-critical and high-risk environments:

- Safety implications of human-computer interaction, Effects of automation, Addressing the effects

Text books:

- Hackos, J.T. & Redish, J.C. (1998). User and task analysis for interface design. John New York: Wiley & Sons.
- Norman, D. (1988). The design of everyday things. New York: Basic Books.

Reference Books:

- Designing the User Interface: Strategy for Effective Human Computer Interaction, 3rd edition, Bel Shneiderman, Perason Edu. Publ. 2000
- Human Computer Interaction Dix, A et al. Prentice Hall 1993
- Graphical User Interface Design and Evaluation Redmond-Pyle, D. & Moore, A. Prentice Hall 1995
- The Art of Human-Computer Interface Design Laurel, B Addison-Wesley 1990

CSHE-08-04-2-F

Fuzzy Logic

L T P
4 - -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs.

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, α -cuts, Properties of α -cuts, Decomposition, Theorems, Extension Principle,

Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations

Section B

Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.

Fuzzy Relations: Crisp & Fuzzy Relations, Projections & Cylindric Extensions, Binary Fuzzy Relations, Binary Relations on single set, Equivalence, Compatibility & Ordering Relations, Morphisms, Fuzzy Relation Equations.

Section C

Possibility Theory: Fuzzy Measures, Evidence & Possibility Theory, Possibility versus Probability Theory.

Fuzzy Logic: Classical Logic, Multivalued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

Section D

Uncertainty based Information: Information & Uncertainty, Nonspecificity of Fuzzy & Crisp sets, Fuzziness of Fuzzy Sets.

Applications of Fuzzy Logic in soft computing.

Text / Reference books :

- Fuzzy Sets, Uncertainty & Information by G.J.Klir & T.A. Folyger, PHI, 1988.
- Fuzzy sets & Fuzzy logic by G.J.Klir & B.Yuan, PHI, 1995.

CSE-08-04-3-F

Natural Language Processing

L T P
4 - -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs.

Note:For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Components of natural language processing: lexicography, syntax, semantics, pragmatics, word level representation of natural languages prosody & natural languages.

Formal languages and grammars: chomsky hierarchy, Left-Associative grammars, ambiguous grammars, resolution of ambiguities.

Section B

Computation linguistics: recognition and parsing of natural language structures: ATN & RTN,General techniques of parsing: CKY, Earley & Tomitas algorithm.

Section C

Semantics-knowledge representation semantic networks logic and inference pragmatics, graph models and optimization, prolog for natural language semantic.

Section D

Application of NLP: intelligent work processors: Machine translation, user interfaces, Man-Machine interfaces, natural language querying, tutoring and authoring systems, speech recognition, commercial use of NLP.

Text Book:

- “Natural Language Understanding” James Allen ,Benjamin-1995, cummings Pub. Comp. Ltd.,

Reference Books:

- “Language as a cognitive process”, Terry Winograd 1983, AW
- “Natural Language processing in prolog” G. Gazder, 1989, Addison Wesley.
- “ Introduction of Formal Language Theory, Mdlj Arbib & Kfaury, 1988, Springer Verlog

L T P
4 - -

Class Work : 50 Marks
Exam : 100 Marks
Total : 150 Marks
Duration of Exam : 3 Hrs.

Note: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which have to attempt 5 questions out of 9 questions.

Section A

Introduction: Review of the Traditional Methodologies, Advantages of Object Oriented Methodologies over Traditional Methodologies, Classes, Objects, Encapsulation, Association, Aggregation, Inheritance, Polymorphism, States and Transitions. Visual Modelling using Unified Modelling Language (UML): What is Visual Modelling? Object Oriented Modelling, Introduction to Unified Modelling Language (UML): History of UML, Overview of UML – Capabilities, Usage of UML.
Introduction to Rational Rose CASE tool: Introduction–Importance of Rational Rose, Capabilities of Rational Rose Case Tool.

Section B

Introduction to Objectory Software Development Process: Introduction, Benefits, Phases and Iterations, Elaboration Stage, Construction Stage, Transition Stage.
Creating Use Case Diagrams: Actors and Use Cases, Use Case Relationships, Types of Relationships, Use Case Diagrams: Creating Main Use Case -, Relationships -, Additional Use Case - Diagrams in Rational Rose, Activity Diagrams Activities, Transitions, Decision Points, Swimlanes
Identifying Classes ,Packages and drawing a Class Diagram: State, Behaviour, Identity of Objects, Stereotypes and Classes, Creating and Documenting Classes in rational Rose, Packages, Drawing a Class Diagram Specifying Relationships : The Need of Defining Relationships, Association and Aggregation
Relationships, Naming Relationships, Role Names, Multiplicity Indicators, Reflexive Relationships, Package Relationships, Inheritance, Finding Relationships, Creating Relationships in Rational Rose

Section C

Discovering Object Interactions: Documenting Scenarios using Interaction Diagrams, Types of Interaction Diagrams, Adding Behaviour and Structure: Representing Behaviour and Structure, Creating Attributes & operations and documenting them, Displaying attributes and operations, Association Classes, Analysing Object Behaviour: Modelling Dynamic Behaviour, States
Checking the Model: Making the Model Homogeneous, Combining Classes, Splitting Classes, Eliminating Classes, Consistency Checking, Scenario Walk-through, Event Tracing, Documentation Review, Designing the System Architecture : The need for Architecture, The “4+1” view of Architecture, The Logical view, The Component View, The Process View, The Deployment View, The Use Case view.

Section D

The Iteration Planning Process: Benefits, Goals, Design the User Interface, Adding Design Classes, The Emergence of Patterns, Designing Relationships, Designing Attributes and Operations, Designing for Inheritance, Coding, Testing, and Documenting the Iteration.

Text Books:

- “UML User Guide”, Grady Booch, James Rumbaugh, Ivar Jacobson, 2000, Addison Wesley.
- Visual Modeling with Rational Rose 2000 and UML By Terry Quatrani Foreword by Grady Booch, 2000

Reference Books:

- “UML Reference Guide”, James Rumbaugh, Ivar Jacobson, Grady Booch, 2000, Addison Wesley.
- “The Objectory Software Development Process”, Ivar Jacobson, Grady Booch, James Rumbaugh, 1999, Addison Wesley.
- UML Distilled by Maxtin Fowler with Kendall Scott, 2000 ,Second Edition
- Sams Teach Yourself “UML” In 24 Hours By Joseph Schmuller ,2000