Annexure No.	**31 F**
SCAA Dated	**29.02.2008**

BHARATHIAR UNIVERSITY, COIMBATORE.

MASTER OF COMPUTER APPLICATIONS (MCA)

With Compulsory Diploma in Web Applications

For Affiliated Colleges

(Effective from 2007-2008)

1. Eligibility for Admission to the Course

Candidates for admission to the first year course leading to the Degree of Master of Computer Applications (M.C.A) will be required to posses the qualification as per AICTE norms:

A pass in any Degree with Mathematics at +2 level or any degree with at least one paper in Mathematics / Statistics at Degree Level.

In case of SC/ST Candidates, a mere pass in any of the above Bachelor's Degree will be sufficient.

2. Duration of the Course

This Course of Study shall be based on Semester System. This Course shall consist of six Semesters covering a total of three Academic Years. For this purpose, each Academic Year shall be divided into two Semesters; the first, third and fifth Semesters; July to November and the second, fourth and sixth Semesters; December to April. The first year examination is conducted in non-semester pattern. The Practical Examinations shall be conducted at the end of each Semester.

3. Course of Study

The Course of the Degree of Master of Computer Applications(MCA) shall be under the Semester System according to the Syllabus to be prescribed from time to time. This Course consists of Core Subjects and Elective Subjects. An additional **Diploma in Web Applications** is along with this course.

4. Scheme of Examinations

MASTER OF COMPUTER APPLICATIONS (MCA)

Sem	Subject and Paper		Instructional Hours per week	University Examinations	
				Duration in Hrs	Max Marks*
I	Paper I	Introduction to Information Technology	4	3	100
	Paper II	Computer Organisation and Architecture	4	3	100
	Paper III	Problem Solving in C	4	3	100
	Paper IV	Numerical Algorithms & Statistics	4	3	100
	Paper V	Accounting and Financial Management	4	3	100
	Practical I	Information Technology Lab	3	3	100
	Practical II	Problem Solving using C Lab	4	3	100
	Dip. Paper I	Diploma Paper I	3	3	100
II	Paper VI	Data Structures and Algorithms	4	3	100
	Paper VII	Relational Database Management Systems	4	3	100
	Paper VIII	System Software and Operating Systems	4	3	100
	Paper IX	Computer Graphics	4	3	100
	Paper X	Mathematical Foundations of Computer Science	4	3	100
	Practical III	Data Structures and Algorithms Lab	3	3	100
	Practical IV	RDBMS Lab	4	3	100
	Dip. Paper II	Diploma Paper II	3	3	100
III	Paper XI	Object Oriented Analysis Design and C++	4	3	100
	Paper XII	Unix Programming	4	3	100
	Paper XIII	Analysis and Design of Information Systems	4	3	100
	Paper XIV	Computer Networks	4	3	100
	Paper XV	Operations Research	4	3	100
	Practical V	OOPS & C++ Lab	3	3	100
	Practical VI	Network & Unix Lab	4	3	100
	Dip.Paper III	Diploma Paper III	3	3	100

Sem	Subject and Paper		Instructional Hours per week	University Examinations	
				Duration in Hrs	Max Marks*
IV	Paper XVI	Visual Programming	4	3	100
	Paper XVII	Java Programming	4	3	100
	Paper XVIII	Management Concepts and Communication	4	3	100
	Paper XIX	Elective – I	4	3	100
	Paper XX	Elective – II	4	3	100
	Practical VII	Visual Programming Lab	4	3	100
	PracticalVIII	Java Programming Lab	3	3	100
	Dip.Paper IV	Diploma Paper IV	3	3	100
V	Paper XXI	Software Engineering	4	3	100
	Paper XXII	Software Testing	4	3	100
	Paper XXIII	Data Mining and Warehousing	4	3	100
	Paper XXIV	Elective – III	4	3	100
	Paper XXV	Elective – IV	4	3	100
	Practical IX	Mini Project	5	3	100
	Practical X	Software Testing Tools Lab	5	3	100
VI	Project Work and Viva Voce (150 + 50)				200

* Includes 25% continuous internal assessment marks

Compulsory Diploma in Web Applications - SCHEME OF EXAMINATION

Subject and Paper		Instructional Hours per week/Credits	University Examinations	
			Duration in Hrs	Max Marks
Paper I	Web Designing	3/4	3	100
Paper II	Web Services	3/4	3	100
Paper III	ASP.NET	3/4	3	100
Paper IV	ASP.NET programming Lab	3/4	3	100
Total		12/16		400

ELECTIVES FOR FOURTH SEMESTER

ELECTIVE – I

E.1.1. Client Server Technology
E.1.2. Digital Image Processing
E.1.3. Neural Networks

ELECTIVE – II

E.2.1. Multimedia and its Applications
E.2.2. Distributed Computing
E.2.3. Simulation and Modelling

ELECTIVES FOR FIFTH SEMESTER

ELECTIVE – III

E.3.1. Software Project Management
E.3.2. Embedded Systems
E.3.3. Bio-informatics

ELECTIVE – IV

E.4.1. WAP & XML
E.4.2. E-Commerce
E.4.3. Artificial Intelligence & Expert Systems

5. Requirement to appear for the Examinations

a) A candidate will be permitted to take the University Examination for any Semester, if

i) he/she secures not less than 75% of attendance out of the 90 instructional days during the Semester.

b) A candidate who has secured attendance less than 75% but 65% and above shall be permitted to take the Examination on the recommendation of the Head of the Institution to condone the lack of attendance as well as on the payment of the prescribed fees to the University.

c) A candidate who has secured attendance less than 65% but 55% and above in any Semester, has to compensate the shortage of attendance in the subsequent Semester besides, earning the required percentage of attendance in that Semester and take the Examination of both the Semester papers together at the end of the latter Semester.

d) A candidate who has secured less than 55% of attendance in any Semester will not be permitted to take the regular Examinations and to continue the study in the subsequent Semester. He/she has to re-do the Course by rejoining the Semester in which the attendance is less than 55%.

e) A candidate who has secured less than 65% of attendance in the final Semester has to compensate his / her attendance shortage in a manner to be decided by the Head of the Department concerned after rejoining the Course.

6. Restriction to take the Examinations

a) Any candidate having arrear paper(s) shall have the option to take the Examinations in any arrear paper(s) along with the subsequent regular Semester papers.

b) Candidates who fail in any of the papers shall pass the paper(s) concerned within 6 years from the date of admission to the said Course. If they fail to do so, they shall take the Examination in the revised Text / Syllabus, if any, prescribed for the immediate next batch of candidates. If there is no change in the Text / Syllabus they shall take the Examination in that paper with the Syllabus in vogue, until there is a change in the Text or Syllabus.

In the event of removal of that paper consequent to the change of Regulations and / or Curriculum after a 6 year period, the candidates shall have to take up on equivalent paper in the revised syllabus as suggested by the chairman and fulfill the requirements as per Regulations/Curriculum for the award of the Degree.

7. The Medium of Instruction and Examinations

The medium of instruction and Examinations shall be in English.

8. Submission of Record Notebooks for Practical Examinations & Project Viva-Voce.

Candidates taking the Practical Examinations should submit bonafide Record Note Books prescribed for the Examinations. Otherwise the candidates will not be permitted to take the Practical Examinations.

Candidates taking the Project Viva Examination should submit Project Report prescribed for the Examinations. Otherwise the candidates will not be permitted to take the Project Viva-voce Examination.

9. The Minimum (Pass) Marks

A candidate shall be declared to have passed in a paper if a student obtains not less than 50% of marks in that paper. A candidate shall be declared to have passed the whole Examination if the student passes in all the papers.

10. Improvement of Marks in the subjects already passed

Candidates desirous of improving the marks secured in their first attempt shall reappear once within the subsequent Semester. The improved marks shall be considered for classification but not for ranking. If there is no improvement there shall not be any change in the original marks already awarded.

11. Classification of successful candidates

A candidate who passes all the Examinations in the first attempt within a period of five years securing 75% and above marks in the aggregated shall be declared to have passed with First Class with Distinction.

Successful candidates passing the P.G. Degree Examinations, securing 60% marks and above shall be declared to have passed the exam in First class. All other successful candidates shall be declared to have passed the Examination in Second Class.

12. Ranking

A candidate who qualifies for the PG Degree Course passing all the Examinations in the first attempt, within the minimum period prescribed for the Course of Study from the date of admission to the Course and secures 1st or 2nd Class shall be eligible for ranking and such ranking will be confined to 10% of the total number of candidates qualified in that particular subject to a maximum of 10 ranks.

The improved marks will not be taken into consideration for ranking.

13. Conferment of the Degree

No candidate shall be eligible for conferment of the Degree unless he / she has undergone the prescribed Course of Study for a period of not less than ten Semesters in an Institution approved of by and affiliated to the University or has been exempted there from in the manner prescribed and has passed the Examinations as have been prescribed.

14. Evening College

The above Regulations shall be applicable for candidates undergoing the respective Courses in the Evening Colleges also.

15. Revision of Regulations and Curriculum

The above Regulation and Scheme of Examinations will be in vogue without any change for a minimum period of three years from the date of approval of the Regulations. The University may revise /amend/ change the Regulations and Scheme of Examinations, if found necessary.

16. Transitory Provision

Candidates who have undergone the Course of Study prior to the Academic Year 2007-2008 will be permitted to take the Examinations under those Regulations for a period of four years i.e. up to and inclusive of the Examination of April 2012 thereafter they will be permitted to take the Examination only under the Regulations in force at that time.

17. Question Paper Pattern :

Section A : 10 x 1 = 10 (2 Objective Questions from each Unit)
Section B : 5 x 5 = 25 (Either or Type, One Question from each Unit)
Section C : 5 x 8 = 40 (Either or Type, One Question from each Unit)

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Subject Title: INTRODUCTION TO INFORMATION TECHNOLOGY
Course Number:
Number of Instruction Hours: 4
Subject Description
This course presents the basics of data and information, acquiring graphical data , data Storage, Computer software ,Computer networks, Data organization.
Goal
To enable the students to learn the basic types of data, image compression fundamentals, memory cell, CPU
Objectives
On successful completion of the course the students should have:

- Understood the concepts of data and information.
- Understood the concepts of data storage, Software, Hardware and Internet.

UNIT I

Data and Information : Types of data, simple model of a computer – Desktop computer. Acquisition of numbers and textual data : Introduction – Input units – Internal representation of numeric data, representation of characters in computers – Error detecting codes.

UNIT II

Acquiring graphical data : Introduction – Acquisition of textual data, pictures – Storage format for pictures – Image compression fundamentals – Image acquisition with digital camera. Acquiring audio data – Acquisition of video – Processing multimedia data – Processing and displaying textual data.

UNIT III

Data Storage : Introduction – Memory cell – RAM, ROM, Floppy Disk Drive, CD ROM, Archival Memory – Central Processing Unit - Output Devices.

UNIT IV

Computer software – Computer networks – Data organization.

UNIT V

Some Internet Applications – Email – WWW – Information Browsing Service – Information Retrieved from World Wide Web – Audio on Internet – Business Information System : Introduction – Types of information needed by organization – Why should we use computer in business – Design of operational information system – System life cycle – Computer systems for transaction processing.

REFERENCE BOOKS

1. V. Rajaraman “Introduction to Information Technology”, Prentice Hall of India, 2003.
2. Ajoy Kumar Ray & Tinku Acharya, “Information Technology – Principles and Applications “, Prentice Hall of India, 2004.
3. Research and Development Wing, ITL Education, “IT Tools and Applications”, Macmillan India Ltd., 2004.
4. S.K. Sarkar & A.K. Gupta, “Elements of Computer Science”, S. Chand & Co., 2002.

Subject Title: COMPUTER ORGANIZATION AND ARCHITECTURE
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the architecture and organization of computers.
Goal:
To enable the students to learn the basic functions, principles and concepts of Computer architecture.
Objectives:
On successful completion of the course the students should have:

- Understood computer architecture
- Understood number systems, I/O, Registers and memory

UNIT I

Number System: Binary, Decimal, Octal, Hexadecimal – Conversion from one to other – Complements - Binary codes.

Basic Logic Gates – Basic Theorems and Properties of Boolean Algebra – NAND, NOR implementation – Sum of Products – Product of Sums – Karnaugh map – Tabulation Method – Don't Care Conditions.

UNIT II

Combinational Logic Circuit Design: Multiplexers – Demultiplexers – Decoders – Encoders – Half Adder – Full Adder – Subtractor – Parallel Adders.

Flip-flops: RS, D, JK Flip-flops – Registers – Shift Registers – Ripple counters – Synchronous counters.

UNIT III

Register Transfer and Micro Operations: Arithmetic circuit – Logic Circuit – Shift Circuit – Arithmetic Logic Shift unit - Stack Organization – Instruction formats – Addressing modes – Data Transfer, Data Transfer, Manipulation and program control instructions.

UNIT IV

Input – Output organization: Peripheral Devices – Input – Output interface – Asynchronous Data Transfer (Strobe & Handshaking Method) – Modes of Transfer – Priority Interrupt – DMA – IOP.

UNIT V

Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.

REFERENCE BOOKS

1. M. Morrris Mano, "Digital Logic and Computer Design", PHI.
2. M. Morrris Mano, "Computer system architecture" Third Edition, PHI/ Pearson Education.
3. Albert Paul Malvino, Donald P. Leach, "Digital Principles and Applications", Tata Mc Graw Hill Pub. Company Ltd.
4. J.P.Hayes, "Computer Architecture and Organization" Tata Mc Graw Hill Pub. Company Ltd.
5. William Stallings, "Computer Organization & Architecture – Designing for performance", Pearson Education, Sixth Edition.

Subject Title: PROBLEM SOLVING IN C
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the Programming techniques in C, explains data types, arrays, pointers, files.
Goal:
To enable the students to learn the basic functions, principals and concepts of programming in C fundamentals.
Objectives:
On successful completion of the course the students should have:

- Understood the Programming in C language

UNIT I

Planning the Computer Program – Flow Chart – Types of Logic used in Flowchart – Computer Languages – Hierarchy of Programming Languages – Classifications of Programming Languages – Popular Programming Languages – Program development process – Characteristics of a Good Program – Program Development Process – Error in Programming.

UNIT II

An overview of C – Data types and sizes – Declarations – Variables – Constants – Operators – Expressions – Storage Classes – Program Control Structures – Loop Control Structures – C Formatted Input/Output – Arrays – Strings

UNIT III

Function – Function Arguments – Function Prototype – Recursion – Structures – Unions – Bit Manipulations and Enumerations – Self-Referential Structures – Dynamic Memory Allocation.

UNIT IV

Pointers – Introduction – Pointers and Arrays – Pointers and Strings – Pointers and Structures – Pointers and Data structures.

UNIT V

File processing – C Preprocessors – Command Line Arguments – Low Level Programming in C – Calling BIOS and DOS Interrupts – Port I/O Functions to Access CMOS – Keyboard and Speaker – Writing into Video Buffer.

REFERENCE BOOKS

1. Yeswanth Kanetkar, “Let us C”
2. Yeswanth Kanetkar, “Pointers in C”
3. Yeswanth Kanetkar, “TSR through C”
4. D.P. Nagpal, “Computer Fundamentals – Concepts system & Applications”
5. Ashok N.Kamthane. “Programming with ANSI and Turbo C”, Pearson Education Asia, 2003.
6. E.Balagurusamy, “Programming in ANSI C”, Tata McGraw Hill
7. Deitel & Deitel, “C How to Program”, Third Edition, PHI/Pearson Education Asia.
8. Tenenbaum, Langsam and Angenstein, :Data Structures Using C”, PHI, ISBN: 81 – 203 – 0696 – 1.

Subject Title: NUMERICAL ALGORITHMS & STATISTICS
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the matrix, numerical methods, and solution of numerical algebraic & transcendental equations, bivariate distribution.
Goal:
To enable the students to learn the basic matrix, numerical methods, tables.
Objectives:
On successful completion of the course the students should have:

- Understood the concept of matrix, distribution, correlation & regression.
- Understood the Numerical Algorithms, Statistics and probability.

UNIT I

Matrix – Rank of a Matrix – Consistency and inconsistency of systems of linear algebraic equations.

Numeral Methods : Curve fitting by methods of least squares - Fitting of a straight line – parabola and exponential curve.

UNIT II

Numerical Methods: Finite difference operators – Difference table – Numerical Interpolation – Finding missing values – Langrange's interpolation. Numerical Differentiation – Numerical integration – Trapezoidal and Simpson's $1/3^{rd}$ rule and $3/8^{th}$ rule.

UNIT III

Solution of Numerical algebraic & transcendental equations – Bisection methods – Method of False position – Newton – Raphson method – Iterative method.

Methods of solving simultaneous linear algebraic equations – Gauss elimination method – Gauss Seidal Iterative methods.

UNIT IV

Univariate Distribution – Frequency Distribution – Grouped and Ungrouped distributions – Measures of Central tendency – Measures of dispersion – Coefficient of variation.

Bivariate Distribution : Correlation – Types of correlation – Karl Pearson's coefficient of correlation – Rank correlation – Regression – Regression equations – Methods of solving regression equations.

UNIT V

Probability : Introduction to Probability – Addition and multiplication theorems conditional probability – Baye's theorem – Probability Distribution – Binomial, Poisson, Uniform, Exponential and Normal distributions. (No derivations – Simple problems only).

REFERENCE BOOKS

1. M.K. Venkataraman, "Numerical Methods in Science and Engineering", National Publishing Company.
2. S.C. Gupta and V.K. Kapoor, "Fundamental of Mathematics Statistics" , Sultan Chand & Sons.
3. P. Kandaswamy K. Thilakavathy and K. Gunavathi, "Numerical Methods", S. Chand & Company Limited, New Delhi, 2nd Edition.

Subject Title: ACCOUNTING AND FINANCIAL MANAGEMENT
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents accounting, final accounts, Ratio analysis, Funds Flow Statement, Budget and Budgetary Control, Costing.
Goal:
To enable the students to learn the accounting fundamentals, principles and concepts.
O**bjectives:**
On successful completion of the course the students should have:

- Understood the basics of Accounting And Financial Management.

UNIT I

Accounting: Definition, Objectives, Advantages, Accounting Concepts, Accounting Conventions. Methods of Accounting – Single Entry and Double Entry System. Basic Books of Accounts – Journal and Ledger – Preparation of Trial Balance.

Final Accounts: Trading and Profit and Loss Account and Balance Sheet of Sole Proprietary Concern.

UNIT II

Ratio Analysis: Meaning – Advantages – Limitations – Classification of Ratio : Profitability, Turnover and Solvency Ratios.

UNIT III

Funds Flow Statement: Concept of Funds – Funds flow Statement – Uses and Limitations – Preparation of Fund Flow Statement – Cash Flow Statement

UNIT IV

Budget and Budgetary Control: Meaning and Definition, Objectives of Budgetary Control, Advantages and Limitations Preparation of Different Types of Budgets.

UNIT V

Costing: Definition, Nature and Importance Advantages and Limitations of Cost Accounting – Classifications of Cost – Preparation of Cost Sheet

Marginal Costing: Meaning, Advantages – Cost – Volume Profit Analysis – Break Even Analysis – Uses and Assumptions – Applications of Marginal Costing.

REFERENCE BOOKS

1. N. Vinayakam, Mani Nagarajan, “Principles of Accountancy”, Eurasia Publishing House, New Delhi.
2. S.N. Maheswari, “Principles of Management Accounting”, Sultan Chand & Co.
3. Sharma and Sasi K. Gupta, “Management Accounting”, Kalyani Publishers.
4. T.S Grewal, “Introduction to Accountancy”, Sultan Chand & Co.
5. Ramachandran and Srinivasan, “Management Accounting”, Sri Ram Publications, Trichy.

PRACTICAL I
INFORMATION TECHNOLOGY LAB

1. Problems using PC Packages. (Word, Excel, PowerPoint)
2. Problems using an Accounting Package.
3. Problems using Simple Multimedia Packages.

PRACTICAL II
PROBLEM SOLVING USING 'C' LAB

1. Programs based on Numerical Algorithms and Statistics.
2. Programs Using Arrays.
3. Programs using Structure.
4. Programs to Access the Array Element using Pointers.
5. Programs Using File.
6. Programs using Control Structures.
7. Programs Using Functions with Pointers.

Subject Title: DATA STRUCTURES AND ALGORITHMS
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course gives an introduction of algorithms, linked lists, internal sorting, symbol tables with case study.
Goal:
To enable the students to learn the data structure fundamentals, principles and concepts.
O**bjectives:**
On successful completion of the course the students should have:

- Understood the various Data Structures, Algorithms for sorting and searching.

UNIT I

Introduction: Introduction of Algorithms, Analysing Algorithms. Arrays: Spare Matrices – Representation of Arrays. Stacks and Queues. Fundamentals – Evaluation of Expression Infix to Postfix Conversion – Multiple Stacks and Queues – Perform Analyse the Algorithms.

UNIT II

Linked List: Singly Linked List – Linked Stacks and Queues – Polynomial Addition – More on Linked Lists – Sparse Matrices – Doubly Linked List and Dynamic – Storage Management – Garbage Collection and Compaction. Trees: Basic Terminology – Binary Trees – Binary Tree Representations – Binary Trees – Traversal – More on Binary Trees – Threaded Binary Trees – Binary Tree Representation of Trees – Council Binary Trees. Graphs: Terminology and Repersentations – Traversals, Connected Components and Spanning Trees – Shortest Paths and Transitive Closure – Perform Analyse the Algorithms.

UNIT III

Internal Sorting: Insertion Sort – Quick Sort – 2 Way Merge Sort – Heap Sort – Shell Sort – Sorting on Several Keys. External Sorting: Storage Devices – Sorting with Disks: K-Way Merging – Sorting with Tapes – Perform Analyse the Algorithms.

UNIT IV

Symbol Tables: Static Tree Tables – Dynamic Tree Tables – Hash Tables: Hashing Functions – Overflow Handling. Files: Files, Queries and Sequential organizations – Index Techniques – File Organizations.

UNIT V

Case Study: Recursion – Towers of Hanoi – Simulation of an Airport – Pattern Matching in Strings – Game Trees.

REFERENCE BOOKS

1. Ellis Horowitz, Sartaj Shani, "Data and File Structures" Galgotia Publication.
2. Ellis Horowitz, Sartaj Shani, Sanguthevar Rajasekaran, "Computer Algorithms", Galgotia Publication.
3. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Pearson Education Asia, Second Edition.
4. Robert Kruse, C.L.Jondo, Bruce Leung, "Data Structures and Program Design in C", PHI/Pearson Education Asia, Second Edition.
5. Gregory L. Heileman, "Data Structures Algorithms and Object Oriented Programming" Tata McGraw Hill Publication Company Ltd.
6. Tremblay Sorenson, "An introductions to Data Structures with Applications", 2nd Edition, Tata McGraw Hill Pub Company Ltd.
7. Dr.M.Murugan, "Graph Theory and Algorithms", Muthali Pub. House, Chennai, 2003.

Subject Title: RELATIONAL DATABASE MANAGEMENT SYSTEMS
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the introduction of database management systems , explains ER model, structure of relational database, indexing and advance data base concepts.
Goal:
To enable the students to learn the basic functions, principals and concepts of
Database management systems.
Objectives:
On successful completion of the course the students should have:

- Understood the basic principles of database management systems, parallel & distributed databases.
- Gained knowledge over various database models, schemas and SQL statements.

UNIT I

Overview of database systems: Managing data- A historical perspective – File systems versus a DBMS - Advantages of a DBMS- Describing and storing Data in a DBMS - Queries in a DBMS - Transaction management – Structure of a DBMS. Database design & ER diagrams – Entities, Attributes, and Entity Sets – Relationships and Relationship Sets- Additional feature of the ER model- conceptual Database design with the ER model.

UNIT II

Relational Model: Integrity constraints over relations – Enforcing integrity constraints – Querying relational data – Logical database design : ER to Relational –Introduction to Views – Destroying / Altering Tables & Views. Relational Algebra and Calculus: Relational Algebra – Relational Calculus

UNIT III

SQL: Queries, Programming, Triggers: The form of a basic SQL Query – UNION, INTERSECT and EXCEPT – Nested Queries – Aggregate operators – Null values –Complex integrity constraints in SQL - Triggers & Active data bases. Transaction Management Overview: The ACID Properties - Transactions & Schedules – Concurrent execution of Transactions – Lock-based concurrency control – Performance of Locking –Transaction support in SQL.

UNIT IV

Schema Refinement and Normal forms: Introduction to Schema refinement – Functional dependencies – Reasoning about functional dependencies – Normal forms –Properties of Decompositions – Normalization – Schema Refinement in data base design – other kinds of dependencies. Security : Introduction to Database security -Access control – Discretionary Access control – Mandatory Access control – Additional issues to security. Concurrency control : 2PL, serializability and Recoverability – Introduction to Lock Management - Lock Conversions –Specialized Locking techniques - Concurrency control without locking.

UNIT V

Parallel & Distributed databases: Introduction – Architecture for parallel databases – Parallel Querry evaluation – Parallelizing individual operations –Parallel Querry Optimization – Introduction to distributed Databases – Distributed DBMS architecture sorting data in a distributed DBMS. Object Database Systems: Motivation Example – Structured data types – Operation on structured data types – Encapsulation & ADTS – Inheritance - Objects, OIDS and Reference Types - Database design for and ORDBMS – OODBMS – Comparing RDBMS, OODBMS and ORDBMS.

REFERENCE BOOKS

1. Raghu Ramakrishnan, Johannes Gehrke –"Database Management Systems", Third Edition, McGraw-Hill Higher Education.
2. Silberschatry, Korth, Sundarshan, "Database system Concepts", Fourth Edition, Mc Graw-Hill Higher Education.
3. Elmasri, Navathe, "Fundamentals of Database Systems", Third Edition, Pearson Education Asia.
4. S.S. Khandare, "Database Management and Oracle Programming", First Edition, 2004, S.Chand and Company Ltd.
5. Nilesh Shah, "Database Systems using Oracle", 2002, Prentice Hall of India.
6. Rajesh Narang, "Database Management Systems", 2004, Prentice Hall of India.

Subject Title: SYSTEM SOFTWARE AND OPERATING SYSTEM
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the principles of System Software, Compilers, Operating System, Principles of Deadlock, Uniprocessor scheduling.
Goal:
To enable the students to learn the basic functions, principless and concepts operating system and system software.
Objectives:
On successful completion of the course the students should have:

- Understood System Software and Operating System concepts.

UNIT I

System Software: Definition – Components of system software – Evolution of system software. Software Processors: Introduction – Translators – Loaders – Interpreters – Assemblers: Overview – Design of a two – Pass assembler – Macros and Macro processors.

UNIT II

Compilers: Overview of the compilation process – Scanning – Parsing – Storage allocation – Compilation of control structures - Code optimization. Loaders and linkage editors: Loading, linking and relocation – Relocatability – Linkage editing.

UNIT III

Operating System – Overview – Objectives and functions – Evolution of operating systems – Process states – Principles of concurrency – Mutual exclusion – Semaphores.

UNIT IV

Principles of Deadlock – Prevention – Detection – Avoidance – Memory management – Fixed partition – Dynamic partition – Simple paging – Simple segmentation – Virtual memory – Locality – Paging – Page size – Segmentation.

UNIT V

Uniprocessor scheduling – Types of scheduling – Scheduling algorithms – File management – File organization and access – Directories – File sharing – Secondary storage management.

REFERENCE BOOKS

1. D.M. Dhamdhere, “Systems Programming and Operating Systems”, Tata McGraw-Hill Publishing Company Ltd., New Delhi.
2. William Stallings, “Operating Systems” , Second Edition, PHI, 2001
3. Pramod Chandra P. Bhatt, “An Introduction to Operating Systems”, Prentice Hall of India, 2003.
4. Andrew S. Tanenbaum, “Modern Operating System”, Prentice Hall of India, Second Edition.

Subject Title: COMPUTER GRAPHICS
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents a Survey of Computers Graphics, Bresenham's Algorithm, Two Dimensional Geometric Transformations, Three Dimensional Concepts, Surface Detection Methods.
Goal:
To enable the students to learn basic transformations, algorithms and concepts.
Objectives:
On successful completion of the course the students should have:

- Understood the Computer Graphics and the various graphic algorithms.
- Understood the 2D and 3D transformations, models and surface rendering

UNIT I

A Survey of Computers Graphics – Overview of Graphics Systems – Output Primitives: Points and Lines, DDA, Bresenham's Algorithm, Properties of Circles & Ellipse, Pixel Addressing.

UNIT II

Two Dimensional Geometric Transformations: Basic Transformations, Matrix Representations, Composite Transformations – Line Clipping – Two Dimensional Viewing – Graphical User Interfaces and Interactive Import Methods.

UNIT III

Three Dimensional Concepts – Three Dimensional Object Representations: Polygon Surfaces – Curved Lines and Surfaces – Quadric Surfaces – Super Quadrics Blobby objects – Spline Representations – Cubic Spline Interpolation.

UNIT IV

Three Dimensional Geometric and Modeling Transformations – Three Dimensional Viewing, Viewing Pipeline, Viewing Co-Ordinates, Projections Clipping.

UNIT V

Visible – Surface Detection Methods: Classification of Visible – Surface Detection Algorithms, Back face Detection, Depth –Buffer Method, A-Buffer Method, Scanline Method, BSP-Tree Method.

Illumination Models and Surface – Rendering Methods: Basic Illumination Models – Polygon Rendering Methods – Color Models and Color Applications – Computer Animation

REFERENCE BOOKS

1. Donald Hearn, M.Pauline Baker, "Computer Graphics C Version" Second Edition, Pearson Education.
2. Zhigangxiang, Roy Phastock, "Computer Graphics", 2nd Edition, TMH.

Subject Title: - MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
Course Number:
Number of Instruction Hours: 4
Subject Description: This course presents the set theory, Introduction to Probability Theory, Automata Theory, Mathematical Logic, and Numerical Methods.
Goal: To enable the students to learn the basic functions, principals and concepts of mathematical foundations of computer science.
Objectives:
On successful completion of the course the students should have:

- Understood the set theory and Probability Theory
- Understood the Automata Theory, Mathematical Logic and Numerical Methods.

UNIT I

Matrices : Definition – Types of Matrices – Basic operations in Matrix – Determinants – Properties of Determinants – Inverse of a Matrix – Finding Eigen values and vectors – Cayley – Hamilton theorem.

UNIT II

Set Theory: Basic set operations – Relations – Types of Relations – Representation of relations in matrix form – Composition of relations – Functions – Types of functions – Principle of mathematical induction.

Boolean Algebra: Definition – Sub Boolean algebra – Boolean functions and Boolean Expression.

UNIT III

Mathematical Logic : Introduction – Connectives, NAND & NOR connectives – Tautology and Contradiction – Truth tables – Logical Networks – Normal forms – Principal disjunctive normal form – Principal conjunctive normal form – Equivalence formulae – Indirect method of proof. Predicate calculus, free and bound variables, inference theory for predicate calculus.

UNIT IV

Graph Theory : Graphs, Diagraph – Types of graph – Simple theorems – Definitions of paths, reach ability – Matrix representation – Shortest path problem – Binary trees – Traversal of binary trees – Expression trees – Infix, postfix, prefix expressions.

UNIT V

Grammars and Language : PSG – Types of grammars – Productions – Regular grammar and languages – Finite State Automata (FSA) – Deterministic and Non deterministic FSA – Conversion of NDFSA to DFSA.

REFERENCE BOOKS

1. M.K. Venkatraman, “Engineering Mathematics”, Vol II, National Publishing Co.
2. Hopcraft & Ullman , “Introduction to Automata Theory, Languages & Computation”, II edition, Pearson Education.
3. Tremblay & Manohar, “Discrete Mathematical structures with applications to computer science” , TMH.
4. J.K. Sharma, “Discrete Mathematics, Macmillan India, Ltd., 2003.
5. P. Radha, T. Santha, “Discrete Mathematics for Computer Science & Applications”, Kalaikathir Publications, , 2003.
6. M. Vijayaraghavan, “Foundations of Mathematics”, Scitech, 2001.

PRACTICAL III

DATA STRUCTURES & ALGORITHMS LAB

1. Array Creation and Operations.
2. Stack and Queue Operations.
3. Recursion, Infix to Postfix Conversion.
4. Polynomial Addition using Singly Linked List.
5. Doubly Linked List Operations.
6. Tree Traversals
7. Graph – Shortest Path
8. Searching – Linear, binary, Fibonacci
9. Sorting – Radix, shell, Quick, Heap, Merge.

PRACTICAL IV

RDBMS LAB

Study features of commercial RDBMS packages such as Oracle and Developer 2000. laboratory exercise should include defining scheme of applications, creation of a database, writing SQL queries to retrieve information from database. Use of host language interface with embedded SQL. Use of forms and report writer package. Some sample applications, which may be programmed, are given below.

- Banking system various schemes
- Online reservation system.
- Personal information.
- Student mark processing system (Internal and External marks).
- Hotel management.
- Stock maintenance.
- College admission system. (both, UG and PG)

Subject Title: OBJECT ORIENTED ANALYSIS AND DESIGN & C++
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the Object Model, classes and objects, overloading, files, exception handling, OO analysis.
Goal:
To enable the students to learn the basic functions, principles and concepts of Object oriented programming.
Objectives:
On successful completion of the course the students should have:

- Understood the Object model and relationship among objects
- Gain knowledge in C++ programming

UNIT I

The Object Model: The Evolution of the Object Model – Elements of the Object Model – Applying the Object Model. Classes and Objects: The Nature of an Object – Relationship among Objects.

UNIT II

Classes and Object: Nature of Class – Relationship Among classes – The Interplay of classes and Objects. Classification: The importance of Proper Classification – identifying classes and objects – Key Abstractions and Mechanism.

UNIT III

Introduction to C++ - Input and output statements in C++ - Declarations - control structures – Functions in C++.

UNIT IV

Classes and Objects – Constructors and Destructors – operators overloading –Type Conversion - Inheritance – Pointers and Arrays.

UNIT V

Memory Management Operators - Polymorphism – Virtual functions – Files –Exception handling - sting handling – Templates.

REFERENCE BOOKS

1. Grady Booch, “Object Oriented Analysis and Design with Applications”, Second Edition, Pearson Education.
2. Ashok N. Kamthane, “Object Oriented Programming with ANSI &Turbo C++”, First Indian Print -2003, Pearson Education.
3. Samanta “Object Oriented Programming with C++ and Java”, PHI.
4. Balagurusamy “Object Oriented Programming with C++”, TMCH, Second Edition, 2003.
5. Debasingh Jana, “C++ and Object Oriented Programming Paradigm”, 2003, PHI.
6. M.P. Bhave and S.A. Patekar, “Object Oriented Programming with C++”, 2004, Pearson Education.

Subject Title: UNIX PROGRAMMING
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the introduction, inter process communication, classical IPC problems, shell programming and system programming in UNIX.
Goal:
To enable the students to learn the basic fundamentals of UNIX operating system, and UNIX programming
Objectives:
On successful completion of the course the students should have:

- Understood the UNIX file system.
- Learnt shell programming & system programming in UNIX

UNIT I
Unix – Introduction – Basic commands – files – permissions – directories – processes – pipes – redirection – filters – vi editor – unix file system – unix file structure.
UNIT II
Shell programming – Shell Syntax : Variables – conditions – control structures – functions – commands – command execution – simple programs
UNIT III
Unix System Programming – System calls and device drivers – Library functions – low level file access – system calls for managing files – files and directory maintenance – scanning directories.
UNIT IV
Process and signals – process – process structure – starting new processes – signals
UNIT V
Interprocess communication – Pipes: process pipes – pipe call – parent and child processes - Semaphores: Definition – example – facilities – shared memory: overview – functions – message queue: overview – functions – Sockets: socket connections.

REFERENCE BOOKS:

1. Peter Dyson, Stan Kelly – Bootle, John Heilborn, “UNIX Complete”, BPB Publications, 1999
2. Richard Stones, Neil Matthew, “Beginning Linux Programming”, WROX, 1999
3. Uresh Vahalia, “UNIX Internals, The New Frontiers”, Pearson Education Limited, 2002

Subject Title: ANALYSIS & DESIGN OF INFORMATION SYSTEMS
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the Information systems analysis overview, system requirement specification, process specification and Data input methods.
Goal:
To enable the students to learn the basic types of information, overview, data dictionary
Objectives:
On successful completion of the course the students should have:

- Understood the analysis & design of information systems
- Learnt the system and process specifications and various data input methods

UNIT I

Information and Management: Types of information – Why do we need a Computer based information system – Management structure – Management and information requirements – qualities of information – Examples of information systems.

UNIT II

Information systems analysis overview: Overview of Design of an Information system – the Role and Task of a System Analyst - Attributes of a Systems Analyst – Tools used by Systems Analyst- Information Gathering : Strategy to gather information – Information Sources – Methods of Searching for Information – Interviewing Techniques – Questionnaires – other methods of information search – Case study.

UNIT III

System Requirement Specification : Data Dictionary – Steps in systems Analysis – Modularizing requirements specification – Feasibility Analysis: Deciding on project goals – Examining alternative solutions – Evaluating proposed system – Cost-benefit analysis – Payback period – Feasibility report- system proposal – Data flow diagram : symbols used in DFDs – Describing a system with a DFD – Good conventions in developing DFDs – Logical and Physical DFDs.

UNIT IV

Process specification: Process specification methods – structured English – Decision Tables : Decision table Terminology and Development - Extended Entry Decision table - Establishing the logical correctness of decision tables – use of Karnaugh maps to detect Logical errors in Decision table – Eliminating redundant specifications

UNIT V

Data input methods: Data input – Coding Techniques – Detection of Error in Codes – Validating Input data – Interactive Data input – Designing outputs: output Devices – Objectives of Output design – Design of Output Reports – design of screens – use of Business Graphics – Control, Audit, Testing and Security of information system – System Design Example.

REFERENCE BOOKS

1. V. Rajaraman , “Analysis and Design of Information System” – 2nd Edition – Prentice-Hall of India, 2004.
2. James A Senn, “ Analysis & Design of Information Systems”, Second Edition, MCH International Edition .

Subject Title: COMPUTER NETWORKS
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the Introduction to computer networks, the physical layer, Data link layer, network layer, Session layer.
Goal:
To enable the students to learn the computer networks concepts and layer description.
Objectives:
On successful completion of the course the students should have:

- Understood the use of computer networks.
- Understood the functions of network layers

UNIT I

Introduction: Use of computer networks – Network Hardware – Network software – Reference models – Example of networks.

UNIT II

The Physical Layer: The Theoretical basis for data communication – Guided transmission Media – Wireless transmission – Communication satellites – The Public switched Telephone network – Cable Television - Mobile telephone system.

UNIT III

Data link layer: Data link layer design issues – Error detection and correction – Elementary data link protocols – Sliding window protocols – Protocol Verification - Example data link Protocols.

UNIT IV

Network layer : Network layer design issues – Routing algorithms – Congestion, Control algorithms – Quality of service – Internetworking – Network layer in the internet. Transport layer: The transport service – Elements of transport protocol – A simple transport protocol - The internet Transport Protocols : UDP – The Internet Transport Protocols : TCP - Performance issues.

UNIT V

Session layer : Design issues, synchronization - Presentation layer : Design issues, cryptography – Application layer : Design issues, file transfer, E-mail.

REFERENCE BOOKS

1. Andrew S. Tanenbaum, “Computer Networks”, IV Edition, PHI/Pearson Education,
2. P. Green – Computer Network Architectures and Protocols, Plenum Press, 1982.
3. Harry Katzan – An Introduction to “Distributed Data Processing”, A Petrocelli Book, New York / Princeton.
4. Tittel – Theory and Problems of Computer Networking, Schaum’s outline series, TMH.
5. Godbole – Data Communication & Networking, TMH.
6. Leon Garcia – Communication Networks : Fundamental Concepts & Key Architecture, TMH.
7. Hari & Barani, “Projects in Networking”, 2005, SCITECH Publications

Subject Title: OPERATIONS RESEARCH
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents linear programming, transportation problem, inventory control, replacement model, and queuing theory.
Goal:
To enable the students to learn the formulation of LPP, mathematical formulation, Assignment problem.
Objectives:
On successful completion of the course the students should have:

- Understood the linear programming problems & programming problems
- Understood the queuing theory & inventory control problems

UNIT I

Linear Programming : Formulation of LPP – Graphical solutions to LPP –Simplex Method - Big M method – Two – Phase Simplex Method - Duality in Linear Programming: Primal & Dual Problems – Dual Simplex Method.

UNIT II

The Transportation Problem: Introduction – Mathematical Formulation- Finding Initial Basic Feasible Solutions – Moving towards Optimality – Unbalanced Transportation Problems – Degeneracy. The Assignment Problem: Introduction – Mathematical formulation - Hungarian Assignment Method – Maximization in Assignment Problem – Unbalanced Assignment Problem – Impossible Assignment.

UNIT III

Inventory control : Introduction – Costs involved in inventory - Deterministic models : EOQ models without and with shortage - Buffer stock and Reorder Level – Price Break models – ABC Analysis.

UNIT IV

Replacement model : Introduction – Replacement of items that deteriorates gradually : value of money does not change with time – value of money changes with time – Replacement of items that fails suddenly : Individual Replacement –Group Replacement.

PERT/CPM: Introduction – Construction of Network - CPM calculations –PERT Calculations.

UNIT V

Queuing Theory : Introduction - Characteristics of queuing system - Problems of single server with finite / infinite population model – Problems of multi server with finite /infinite population model.(No derivation)

REFERENCE BOOKS

1. Kanti Swarup, P.K. Gupta, Man Mohan, “Operations Research”, Sultan Chand & Sons.
2. P.K. Gupta, D.S Hira, “Problems in Operations Research”, S.Chand & Company Ltd.
3. Hamdy A. Taha, “Operations Research – An Introduction”, Seventh Edition, PHI/Pearson Education.
4. Frederick S. Hillier, Gerald J. Lieberman, “Introduction to Operations Research”, Tata McGraw Hill Pub Company Ltd., Seventh Edition.
5. J.K.Sharma, “Operations Research Theory and Applications”, Macmillan India Ltd., Second Edition.

PRACTICAL V

OOPS & C++ LAB

1. C++ Program using operator overloading functions.
2. C++ Program using Type Conversion.
3. C++ Program using String manipulation functions.
4. C++ Program using friend functions.
5. C++ Program using inheritance.
6. C++ Program using Polymorphism.
7. C++ Program using files.
8. C++ Program using pointers.
9. C++ Program using templates.

PRACTICAL VI

NETWORK & UNIX LAB

1. Study of Asynchronous and Synchronous communication using UNIX
2. Study of different routing Protocols using UNIX
3. Study of RPC under Client – Server environment using UNIX
4. Study of different application standards using UNIX in the areas of
   * File transfer access and management .
   * Remote logging and Virtual terminals.
   * E- mail Systems.
5. Study of network configurations and systems details.
6. Shell Programs using the concepts of OS.
7. System Programs using UNIX.

Subject Title: VISUAL PROGRAMMING
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents an overview of VB and .NET, functions, VC++ Programming, arrays, ODBC.
Goal:
To enable the students to learn the basic VB.NET and concepts of arrays, VC++
Objectives:
On successful completion of the course the students should have:

- Understood VB.net programming
- Understood VC++ programming

UNIT I

Introduction to VB.Net – Welcome to Visual Basic.NET – Opening closing windows toolbars – Existing project – Auto Hide – Customizing windows placing controls on a form – Selecting and resizing controls – Relocating controls – Properties windows and setting properties of forms and controls (using properties window and using event procedure).

UNIT II

Visual Basic.NET variables - Data types constant – Building project – Displaying output – Operators – Conditional statements – If-then, Select-case – Looping – Do, For next, Nested loops.

Import statement – Msg box – Functions – Input Box ( ) – Functions – User defined and built-in functions – Controls.

UNIT III

Arrays – Menus and dialog boxes, structures programming – Object oriented Programming. Files classification – Handling files using function and classes – Directory class – File class – File processing.

UNIT IV

Visual C++: Programming: MFC and Windows – MFC Fundamentals – MFS Class Hierarchy – MFC Member & Global Functions – Various Object Properties – Cobject, CArchive, CWinApp, CWnd, CFile, CGD, Object, CExcept, CDialog, CString, CEdit, CList – Resources: Menus – Accelerators, Dialogs, Icons, Bitmaps, Versions – Message Maps – Document/View Architecture.

UNIT V

VC++ (Contd): connecting to Data Source – DAO – ODBC – Thread – Based Multitaksing – Visual C++ APPWIZARD and class Wizard.

REFERENCE BOOKS

1. Eric A Smith, Valor Whisher, Hank Marquis, “Visual Basic 6 Programming Bible”.
2. Herbert Schildt, “MFC Programming From the Ground up” Second Edition , Tata McGrawHill.
3. MSDN Visual studio Library.
4. Cornell, “Visual Basic 6 From the Ground Up”, Tata Mcgraw – Hill Company Ltd
5. Mveller, “Visual C++ from the Ground up”, TMCH.
6. Viktor Toth, “Visual C++6 Unleased”, Second Edition, Techmedia.

Subject Title: JAVA PROGRAMMING
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the basic concepts of object oriented programming, methods data types, class and objects, packages; overview of JDBC, Overview of Servlet technology.
Goal:
To enable the students to learn the basic functions, principles and concepts of java programming.
Objectives:
On successful completion of the course the students should have:

- Understood the basics of java programming
- Learnt multithreading, string manipulation, Java Beans and Servlets

UNIT I

Introduction: History of JAVA, JAVA class libraries – Basics of a typical JAVA environment – Arithmetic, Equality and Relational Operators – Thinking about Objects, Applet: Adding Integers (Example) – Control Structures: if, if/else, while, for, switch, do/while, break and continue – Operators: Assignment, Increment and Decrement and Logical – Primitive Data types.

UNIT II

Methods: program modules in JAVA – Methods – Method definitions – JAVA API packages – Duration of identifiers – Scope rules – Method overloading - Arrays – References and Reference parameters – Passing arrays to methods – Multiple subscripted arrays – Class scope – Controlling access to members – Creating packages – Constructors – Overloaded constructors – Set and Get methods – Final instance variables – Packages access – Using this reference – Finalizers – static Class members – Data abstraction and Information Hiding – Superclasses and Subclasses – protected members – Constructers and Finalizers in subclass – inner class definitions – Type wrapper class for primitive types.

UNIT III

String constructors – String methods: length, CharAt, getChars, hashCode, value of, intern and miscellaneous string methods – Substrings and concatenating strings – stringBuffer class – stringTokenizer Class – Graphics contexts and Graphics Objects – color and Font controls – Drawing lines, Rectangles, Ovals, Arcs, Polygons and Polylines - The JAVA2D API – Swing overview – Jlabel – Event handling model – JtexField, JpasswordField, Jbutton, JcheckBox, Jradio Button, JcomboBox, Jlist, JtextArea, Jslider – Mouse event handling, Adapter classes – Layout managers – Panels – Using menus with frames – Boxlayout manager.

UNIT IV

The basics of JAVA exception handling – Try blocks – Throwing,Catching and Rethrowing an exception – Throws clause – finally block – Class Thread: an overview – Thread states – Thread priorities and scheduling – Thread synchronization – Runnable interface – Thread groups – Loading, displaying and scaling images – Files and Streams – Creating, Reading and Updating a sequential access file – Creating, Writing and Reading a random access file – Class file – Reading, Inserting and Updating a database (Use JDBC to a MS Access)

UNIT V

Overview of Servlet technology - Handling HTTP GET and POST requests – Session tracking – RMI: defining, implementing the RMI – Define the Client – Compile Execute the server and the client – Networking : Reading a file on a web server – Establishing a simple server and a simple client (using stream sockets) – Random and BitSet Class – Class arrays – Interface Collection and Class Collections – Sets – Maps – JAVABEANS : Preparing a class to be a JavaBean – Creating a JavaBean – Adding Beans and Properties to a JavaBean – Connecting Beans with Events in the BeanBox – the BeanInfo class.

REFERENCE BOOKS

1. Deitel and Deitel, " Java How to Program", Third Edition, PHI/Pearson Education Asia.
2. Keyur shab,"Java 2 programming", Tata McGraw-Hill Pub. Company Ltd.
3. C.Xavier,"Programming with Java 2",SciTech Publications (India) P. Ltd.
4. Cays S. Horstmann, Gary Cornell, "Core Java2 Volume I – Fundamentals", Pearson Edition, 2001
5. Cays S. Horstmann, Gary Cornell, "Core Java2 Volume II – Fundamentals", Pearson Edition, 2003

Subject Title: MANAGEMENT CONCEPTS & COMMUNICATION
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the basic concepts of management, planning, motivation, controlling, staffing and communication.
Goal:
To enable the students to learn the basic definition of management, functions and communication
Objectives:
On successful completion of the course the students should have:

- Understood management concepts & communication
- Understood planning, motivation, controlling, staffing and communication.

UNIT I

Management – meaning ad definition – features – functions - importance –difference between Administration and management – management hierarchy.

Planning – meaning – nature – objectives – importance - steps in planning –advantages and limitations – management by objectives.

UNIT II

Organization – Meaning – functions – principles - types of organization -merits and demerits – delegation of authority – Decentralization - advantages and disadvantages.

Departmentation – meaning - process – basis types of Departmentation - importance.

UNIT III

Staffing – definition - processing of staffing - recruitment - sources of recruitment - stages in selection procedure - trading and development.

Motivation - meaning and importance – types - theories of motivation - Maslow, McGregor, herzberg. Leadership - need and importance – qualities of leadership - leadership styles.

UNIT IV

Controlling – definition - steps in control process - requirements of effective control system. Advantages and limitations - budgetary and non-budgetary control techniques.

Communication - meaning and importance - process of communication - principles – types – barriers to communication - overcoming barriers.

UNIT V

Written communication - Business letters – lay-outs of business letter - drafting letters for sales and collection.

Oral communication – interviews - telephone conversation - instruction –dictation. Conducting meetings: notice, agenda, minutes.

REFERENCE BOOKS

1. L.M. Prasad, “Principles and Practice of Management”, Sultan Chand and Sons.
2. Tripathy and Reddy, “Principles of management”, Tata Mcgraw Hill.
3. Koontz and Werich, Management”.
4. Rajendran paul and Korala Kalli, “Essentials of Business communication”, Sultan Chand & sons.

PRACTICAL VII

VISUAL PROGRAMMING LAB

VC++ PRACTICAL LIST

1. Program to crate a Window Using MFC
2. Program to implement Message Maps
3. Program to build Arithmetic Calculator
4. Program to perform Car Application
5. Program for List Box Application
6. Program to implement Threads
7. Program to Create Circle & Rectangle
8. Program to Draw Circles On Mouse Click Point
9. Program for Payroll Application using ODBC
10. Program for Students Details using DAO

VB.NET PROGRAM LIST

1. Program for a various font application
2. Program for a notepad application
3. Program for employee details
4. Program for supplier details
5. Program for hospital management
6. Program for newspaper vendor
7. Program for simple calculator.
8. Program for create and reading text file.

PRACTICAL VIII

JAVA PROGRAMMING LAB

1. Create an employee package to maintain the information about the employee. Use constructors to initialize the employee number and use overloading method to set the basic pay of the employee. By using this package create a java program.
2. Program to implement polymorphism, inheritance and inner classes.
3. Create a frame with user specific size and position it at user specific position (use command line argument). Then different shapes with different colours (use menus).
4. Java program to handle different mouse events.
5. Create an applet for a calculator application.
6. Java program to maintain the student information in text file.
7. Animate images at different intervals by using multi threading concepts.
8. Program to send a text message to another system and receive the text message from the system (use socket programming).
9. Java program by using JDBC concepts to access a database.
10. Java program to implement RMI.
11. Java program by using to implement the tree viewer.
12. Java bean program to view an image.
13. Java program that prohibit to reading of text files that containing bad words.

Subject Title: SOFTWARE ENGINEERING
Course Number:
Number of Instruction Hours: 4
Subject Description: This course presents the role of software, system analysis, design concepts, methods, testing methods and strategies
Goal: To enable the students to learn the basic functions, principles and concepts of software engineering.
Objectives:
On successful completion of the course the students should have:

- Understood the role of software engineering
- Understood the design concepts, testing methods and strategies

UNIT I

The evolving role of software – Software – Software Crises and Myths – Software Engineering: Layered Technology – The software process model – Evaluating Software Process models – Component Based development – The formal methods model – 4GT – Software Project Planning: Project Planning objectives – Software Scope – resources – Software Project estimation – Decomposition Techniques – Empirical estimation models.

UNIT II

Analysis concepts & Principles: Requirement Analysis – Analysis Principles – Software Prototyping – Specification. Analysis modeling: Data Modeling – Functional modeling & information flow – Behavioral modeling.

UNIT III

Design concepts & Principles: The design process – Design Principles – Design concepts – Effective modular design.

Architectural design: Software Architecture – Data design – Analysing alternative Architectural design – Mapping requirements into software Architecture – Transform mapping – Transaction mapping.

UNIT IV

User interface design: The Golden Rules – User interface design – Task analysing and modeling – interface design activities – implementation tools – Design Evaluation.

Component level design: Structured Programming – Comparison of Design notations.

Object-Oriented design: Design for object – Oriented systems – the system design process – The object design process.

UNIT V

Software Testing Techniques: Software Testing Fundamentals – Test case design – White box Testing – Basis path Testing – Control structure testing – Black box Testing.

Software Testing strategies: A Strategic Approach to software testing – Strategic issues – Unit Testing – integration testing – Validation testing – System testing.

REFERENCE BOOKS

1. Roger S Pressman – “Software Engineering a Practioner’s Approach”, Fifth Edition, McGraw-Hill Higher Education.
2. Rajib Mall, “Fundamentals of Software Engineering”, PHI, Second Edition.
3. Sommerville, “Software Engineering”, Pearson Education, Sixth Edition.
4. Richard Fairly, “Software Engineering Concepts”, Tata McGraw Hill, 1997
5. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, “Fundamentals of Software Engineering”, Second Edition, PHI/Pearson Education Asia.

Subject Title : SOFTWARE TESTING
Course Number:
Number of Instruction Hours: 4
Subject Description : This course provides principles of Software Testing and tools.

Goal :
To enable the students to learn about the principle and tools of Software testing.

Objectives :
On successful completion of the course the students must have

- understood the concepts of Software testing
- got the skill of software testing
- exposed to software testing tools.

Content

UNIT I
Purpose of Software testing – Some Dichotomies – a model for testing – Playing pool and consulting oracles – Is complete testing possible – The Consequence of bugs – Taxonomy of Bugs.

UNIT II
Software testing Fundamentals – Test case Design – Introduction of Black Box Testing and White Box testing – Flow Graphs and Path testing – Path testing Basics - Predicates, Path Predicates and Achievable Paths - Path Sensitizing – Path Instrumentation – Implementation and Application of Path Testing.

UNIT III
Transaction Flow testing – Transaction Flows – techniques – Implementation Comments – Data Flow Testing – Basics – Strategies – Applications, Tools and effectiveness – Syntax Testing – Why, What, How – Grammar for formats – Implementation – Tips.

UNIT IV
Logic Based Testing – Motivational Overview – Decision tables – Path Expressions – KV Charts – Specifications – States, State Graphs and transition Testing – State Graphs – Good & bad states – state testing Metrics and Complexity.

UNIT V
Testing GUIs – Testing Client – Server Architecture – Testing for Real-time System – A Strategic Approach to Software testing – issues – unit testing – Integration Testing – Validation testing – System testing – The art of Debugging.

REFERENCES :

1. Boris Beizer, Software testing techniques, Dreamtech Press, Second Edition – 2003.
2. Myers and Glenford.J., The Art of Software Testing, John-Wiley & Sons,1979
3. Roger.S.Pressman, Software Engineering – A Practitioner's Approach ,Mc-Graw Hill, 5th edition, 2001
4. Marnie.L. Hutcheson, Software Testing Fundamentals, Wiley-India,2007

Subject Title: DATA MINING AND WAREHOUSING
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the basic data mining, data mining techniques, classification, clustering and data warehousing.
Goal:
To enable the students learn the data mining techniques and data warehousing concepts.
Objectives:
On successful completion of the course the students should have:

- Understood the data mining and data warehousing techniques.

UNIT I

Basic data mining tasks – data mining versus knowledge discovery in databases – data mining issues – data mining metrices – social implications of data mining – data mining from a database perspective.

Data mining techniques: Introduction – a statistical perspective on data mining – similarity measures – decision trees – neural networks – genetic algorithms.

UNIT II

Classification: Introduction – Statistical – based algorithms - distance – based algorithms – decision tree - based algorithms - neural network – based algorithms –rule - based algorithms – combining techniques.

UNIT III

Clustering: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms - Partitional Algorithms.

Association rules: Introduction - large item sets - basic algorithms – parallel & distributed algorithms – comparing approaches- incremental rules – advanced association rules techniques – measuring the quality of rules.

UNIT IV

Data warehousing: an introduction - characteristics of a data warehouse – data marts – other aspects of data mart. Online analytical processing: introduction - OLTP & OLAP systems – data modelling –star schema for multidimensional view –data modelling – multifact star schema or snow flake schema – OLAP TOOLS – State of the market – OLAP TOOLS and the internet.

UNIT V

Developing a data WAREHOUSE: why and how to build a data warehouse –data warehouse architectural strategies and organization issues - design consideration – data content – metadata distribution of data – tools for data warehousing – performance considerations – crucial decisions in designing a data warehouse.

Applications of data warehousing and data mining in government: Introduction - national data warehouses – other areas for data warehousing and data mining.

REFERENCE BOOKS

1. Margaret H. Dunham, "Data mining introductory and advanced topics", Pearson education, 2003.
2. C.S.R. Prabhu, "Data warehousing concepts, techniques, products and applications", PHI, Second Edition.
3. Arun K.Pujari, " Techniques", Universities Press (India) Pvt. Ltd., 2003.
4. Alex Berson, Stephen J. Smith, "data warehousing, data mining, & OLAP, TMCH, 2001.
5. Jiawei Han & Micheline Kamber, " Data mining Concepts & Techniques", 2001, Academic press

PRACTICAL IX

MINI PROJECT
(GUIDELINES FOR MINI PROJECT)

* The aim of the Mini Project is to lay a foundation for the Main Project.

* Each student should carry out individually one Mini Project Work and it may be a case study using the software packages that they have learned or may be an implementation of a concept in a paper prescribed on a journal.
* It should be compulsorily done in the college only under the supervision of the staff concerned.
* University Exam will be conducted as like a practical exam with one Internal and one External Examiner, which carries 50 marks for project evaluation and 25 marks for viva examination. Remuneration for the examiners is equivalent as that of practical examination.

PRACTICAL X

SOFTWARE TESTING TOOLS LAB

Various S/W Testing Can Be Done Related To the Methods Given Below Using Any Of The S/W Testing Tools

1. Design Phase testing
2. Program Phase Testing.
3. Debugging
4. Evaluation of test results
5. Installation phase testing & Acceptance testing

ELECTIVE I

Subject Title: Client Server Technology
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the overview of client/server computing, client/server hardware and software requirements, application development and production environments.
Goal:
To enable the students to learn the concept of client/server computing
Objectives:
On successful completion of the course the students should have:

- Understood the client/server computing techniques
- Understood the client/server application development and production environments

UNIT I
Overview of Client/Server computing: What is Client/Server Computing-Benefits of Client/Server Computing-Evolution of Client/server Computing: Hardware and Software Trends-Overview of Client /Server Applications: Components of Client/Server Application-Classes of client/server application-Categories of Client/Server Applications-Understanding Client /Server Computing: Obstacles-Open systems and standards-Factor for success
UNIT II
The Client Hardware and Software: Client Components-Client operating systems-GUI-X Windows versus Windowing–Database access-Application logical-Client Software Products: GUI Environment-Database access tools Client Requirements-The Server-Categories –Features of Server Machines-Classes of Server Machines-Server Environment.
UNIT III
Server Requirements-Server Data Management and Access Tools-Data Manager Features-Data Management Software-Database Gateways-Overview of Networking-LAN Hardware and Software: LAN Hardware-Network Operating Sytems
UNIT IV
Applications Development Environments-Managing the Production Environment-Distributed Transaction Management-Integrating Multivendor Environments-
UNIT V
Production Requirements: System Management-Network Management-Runtime Specifications-Distributing Software Updates-Hardware and Software Trends

REFERENCE BOOKS:

1. **Dawna Travis Dewire, " Client Computing", Tata McGRAW-Hill Edition, 2003**
2. **Robert Orfali, Dan Harkey and Jerri Edwards, "Essential Client/Server Survival Guide", John Wiley & Sons Inc., 1996.**
3. **Joe Salemi, "Client/Server Databases".**
4. **Patrick Smith et al., "Client/Server Computing".**
5. **Larry I.Vaughn, "Client/Server System Design and Implementation".**
6. **Alex Berson, "Client/Server Architecture".**
7. **Neil Jenkins et al., "Client/Server Unleashed".**

ELECTIVE I
Subject Title: DIGITAL IMAGE PROCESSING
Course Number:
Number of Instruction Hours: 4
Subject Description
This course presents the Introduction to Digital image Processing, fundamentals, image enhancement and image restoration techniques
Goals
To enable the students to learn the fundamentals of Digital Image Processing, image compression and segmentation
Objectives
On Successful completion of the course the students should have:

- Understood the fundamentals of Digital Image Processing, image compression and segmentation

UNIT I

Introduction: What is Digital image processing – the origin of DIP – Examples of fields that use DIP – Fundamentals steps in DIP – Components of an image processing system.

Digital Image Fundamentals: Elements of Visual perception – Light and the electromagnetic spectrum – Image sensing and acquisition – Image sampling and Quantization – Some Basic relationship between Pixels – Linear & Nonlinear operations.

UNIT II

Image Enhancement in the spatial domain:- Background – some basic Gray level Transformations – Histogram Processing – Enhancement using Arithmetic / Logic operations – Basics of spatial filtering – Smoothing spatial filters – Sharpening spatial filters – Combining spatial enhancement methods.

UNIT III

Image Restoration: A model of the Image Degradation / Restoration Process – Noise models – Restoration is the process of noise only – Spatial Filtering – Periodic Noise reduction by frequency domain filtering – Linear, Portion – Invariant Degradations – Estimating the degradation function – Inverse filtering – Minimum mean square Error Filtering – Constrained least squares filtering – Geometric mean filter – Geometric Transformations.

UNIT IV

Image Compression: Fundamentals – Image compression models – Elements of Information Theory – Error Free compression – Lossy compression – Image compression standards.

UNIT V

Image Segmentation: Detection and Discontinuities – Edge Linking and Boundary deduction – Thresholding – Region-Based segmentation – Segmentation by Morphological watersheds – The use of motion in segmentation.

REFERENCE BOOKS

1. Rafael C. Gonzalez, Richard E. Woods, “Digital Image Processing”, Second Edition, PHI/Pearson Education.
2. B. Chanda, D. Dutta Majumder, “Digital Image Processing and Analysis”, PHI, 2003.
3. Nick Efford, “Digital Image Processing a practical introducing using Java”, Pearson Education, 2004.

ELECTIVE I
Subject Title: NEURAL NETWORKS
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the introduction to the basic neuron, kohenen self- organizing network, hop field networks, associative memory, fuzzy.
Goal:
To enable the students to learn the basic functions, principles and concepts of Neural Networks.
Objectives:
On successful completion of the course the students should have:

- Understood the pattern classification in Neural Networks
- Understood the fuzzy relation and fuzzy logic

UNIT I

Pattern classification - Learning and Generalization - Structure of neural networks - ADA line, Delta rule - input output value - perceptions - Linear separability - Back propagation - XOR Function - Introduction to Boolean neural networks.

UNIT II

Hopfield Networks - Energy - The Hamming Network - RAM -Boltzmann machine - Instar, outstar network - ART - Kohonen's Network Neocognitron.

UNIT III

Fuzzy relation - Member function - Fuzzy matrices - Fuzzy entropy - Fuzzy operation - Fuzzy composition.

UNIT IV

Fuzzy variables - Linguistic variables - Measure of fuzziness - Transition Matrix - Concept of Defuzzication and Applications

UNIT V

CASE STUDY: Application of Neural Networks in character recognition, drug discovery, speech recognition; Application of Fuzzy logic concepts in Fuzzy controller design and Fuzzy querying in Relational database model.

REFERENCE BOOKS

1. P.D.Wasserman, "Neural computing and practice", Van Nostran Reinhold, New York, 1991.
2. Limin Fu, "Neural Network in computer Intelligence ", McGraw Hill International editions, 1994.
3. B Kosko, " Neural Network and Fuzzy systems", Prentice Hall, 1996.
4. Klir & Yuan, "Fuzzy sets and Fuzzy logic", Theory and Applications, Prentice Hall of India, 1996.

ELECTIVE II
Subject Title: MULTIMEDIA & ITS APPLICATIONS
Course Number:
Number of Instruction Hours: 4
Subject Description
This course presents the Introduction to Multimedia, Images & Animation.
Goals
To enable the students to learn the concepts of Multimedia.
Objectives
On Successful completion of the course the students should have:

- Understood the Multimedia animation and Desktop Computing.

UNIT I

What is Multimedia – Introduction to making Multimedia – Macintosh and Windows Production platforms – Basic Software tools.

UNIT II

Making Instant Multimedia – Multimedia authoring tools – Multimedia building blocks – Text – Sound.

UNIT III

Images – Animation – Video.

UNIT IV

Multimedia and the Internet – The Internet and how it works – Tools for World Wide Web – Designing for the World Wide Web.

UNIT V

High Definition Television and Desktop Computing – Knowledge based Multimedia systems.

REFERENCE BOOKS

1. Tay Vaughan, “Multimedia making it work”, Fifth Edition, Tata McGraw Hill.
2. John F. Koegel Bufford, “Multimedia Systems”, Pearson Education.
3. Judith Jeffloate, “Multimedia in Practice (Technology and Applications)”, PHI, 2003

ELECTIVE II
Subject Title: Distributed Computing
Course Number:
Number of Instruction Hours: 4
Subject Description
This course presents the Introduction to fully Distributed Processing Systems, Communication Line Loading and Client/Server Network Model.
Goals
To enable the students to learn the concepts of Distributed Computing
Objectives
On Successful completion of the course the students should have:

- Understood the Distributed Processing Systems Design, Client/Server Network Model and Distributed databases.

UNIT I

Distributed Systems: Fully Distributed Processing Systems – Networks and Interconnection Structures – Designing a Distributed Processing System.

UNIT II

Distributed Systems: Pros and Cons of Distributed Processing – Distributed Databases – The Challenge of Distributed Data – Loading Factors – Managing the Distributed Resources – Division of Responsibilities.

UNIT III

Design Considerations: Communication Line Loading – Line Loading Calculations – Partitioning and Allocation – Data Flow Systems – Dimension Analysis – Network Database Design Considerations – Ration Analysis – Database Decision Trees – Synchronization of Network Databases.

UNIT IV

Client/Server Network Model: Concept – File Server – Printer Server – an e-mail Server.

UNIT V

Distributed Databases: An overview – Distributed Databases – Principles of Distributed Databases – Levels of Transparency – Distributed Database Design – The R* Project Technique Problems of Heterogeneous Distributed Databases.

REFERENCE BOOKS

1. John A. Sharp, “An Introduction to Distributed and Parallel Processing”, Blackwell Scientific Publications, 1987.
2. Uyless D. Black,“Data Communications & Distributed Networks”.
3. Joel M. Crichllow, “Introduction to Distributed & Parallel Computing”.
4. Stefans Ceri, Ginseppe Pelagatti, “Distributed Databases Principles and systems”, McGraw Hill Book Co., New York, 1985.

ELECTIVE II
Subject Title: SIMULATION & MODELLING
Course Number:
Number of Instruction Hours: 4
Subject Description : This course presents the Principles of Modelling, Random Generation and Simulation Techniques.
Goals : To enable the students to gain knowledge in Simulation techniques and languages, random number generation and distribution techniques.
Objectives
On Successful completion of the course the students should have:

- Gained Knowledge of Simulation & Modeling Techniques.

UNIT I

Principle of computer modeling and simulation, Monte Carlo simulation. Nature of computer modelling and simulation. Limitations of simulation, areas of application. System and environment – components of a system – Discrete and continuous systems. Models of a system – A variety of modelling approaches.

UNIT II

Random number generation, technique for generating random numbers – Midsquare method – The midproduct method – Constant multiplier technique – Additive congruential method – Linear congruencies method – Tests for random number – The Kolmogorov Smirnov test – The chi-square test.

Random variable generation – Inverse transform technique – Exponential distribution – Uniform distribution – Weibull distribution, empirical continuous distribution – Generating approximate normal variates.

UNIT III

Empirical discrete distribution – Discrete uniform distribution – Poisson distribution – Geometric distribution – Acceptance – Rejection technique for Poisson distribution – Gamma distribution.

UNIT IV

Design and evaluation of simulation experiments – Input – Output analysis – Variance reduction technique – Verification and validation of simulation models. Discrete event simulation – Concepts in discrete – event simulation – Manual simulation using event scheduling, single channel queue, two server queue, simulation of inventory problems.

UNIT V

Simulation languages – GPSS – SIMSCRIPT – SIMULA – Programming for discrete event systems in GPSS and C.

Case Study: Simulation of LAN – Manufacturing system – Hospital management system.

REFERENCE BOOKS

1. Jerry Banks and John S. Carson II, “Discrete Event System Simulation”, Prentice Hall Inc, 1984.
2. Narsingh Deo, “System Simulation with Digital Computer”, Prentice Hall of India, 1979.
3. Francis Neelamkovil, “Computer Simulation and Modeling”, John Wiley & Sons, 1987.
4. Averil M. Law and W. David Kelton, “Simulation Modeling and Analysis”, McGraw Hill International Editions, 1991.

ELECTIVE III
Subject Title: SOFTWARE PROJECT MANAGEMENT
Course Number:
Number of Instruction Hours: 4
Subject Description:

This course presents the product life cycle, software configuration management, software requirements gathering, design and development phases.

Goal:

To enable the students to learn the entire product life cycle of software project.

Objectives:

On successful completion of the course the students should have:

- Understood the Software configuration management and quality assurance
- Understood the Software Requirements gathering, estimation and testing

UNIT I

Product Life Cycle: Introduction –Idea Generation- Prototype Development Phase- Alpha phase –Beta phase- Protection phase- Maintenance and obsolescence phase. Project Life Cycle Models: What is project life cycle model-A frame work for studying different life cycle models- The waterfall model- The prototype model- The Rapid Application Development Model- The spiral model and its variants. Metrices: Introduction- The metrices roadmap- A typical metrices strategy – What should you measure – Set Targets and Track them- Understanding and Trying to minimize variability- Act on data-People and Organisational Issues in metrices programmes- Common Pitfalls to watch out for in metrices programmes- Metrices implementation checklists and tools.

UNIT II

Software configuration management: Introduction-Basic definitions and terminology- The Process and Activities of software Configuration Audit –software configuration management in geographically distributed teams-Metrices in software configuration management –software configuration management tools and automation. Software quality assurance: How do you define quality- why is quality important in software- Quality Control and quality assurance –cost and benefits of quality – software quality analyst's functions- some popular misconceptions about the SQA's role –software quality assurance tools –organisational structures –Profile of a successful SQA-measures of SQA success –pitfalls to watch out for in the SQA's role. Risk management: Introduction-what is Risk management and why is it important- Risk management cycle- Risk identification: common tools and techniques- Risk quantification –Risk monitoring-Risk mitigation- Risks and mitigation in the context of global project- Teams –some practical techniques in risk management –metrices in risk management.

UNIT III

Software Requirements gathering: Inputs and start criteria for requirements gathering- Dimensions of requirements gathering-steps to be followed during requirements gathering- outputs and quality records from the requirements phase- skills sets required during the requirements phase- Differences for a Shrink-wrapped software- challenges during the requirements management phase- metrices for the requirement phase.

Estimation: what is estimation-when & why is estimation done – The Three phases of estimation-estimation methodology- Formal models for size estimation –Translation effort estimated into schedule estimates –common challenges during estimation – metrices for the estimation processes.

UNIT IV

Design and development phases: some difference in our chosen approach-Salient features of design- Evolving an architecture /Blueprint –Design for reusability- Technology choices /constraints –Design to standards –design for portability- User interface issues- design for testability-design for diagnosability- design for maintainability- design for Installability-Inter – Operability design-challenges during design and development phases-skill sets for design and development metrices for design and development phases.

Project management in the testing phase: Introduction- what is testing- what are the activities that make up testing- test scheduling and types of tests-people issues in testing-management structures for testing in global teams –metrics for testing phase.

UNIT V

Project management in the maintenance phase: Introduction- activities during the maintenance phase-management issues during the maintenance phase- configuration management during the maintenance phase –skill sets for people in the maintenance phase-estimating size, effort and people resources for the maintenance phase- advantages of using geographically distributed teams for the maintenance phase-metrics for the maintenance phase.

Globalization issues in project management: Evolution of globalization- challenges in building global teams-models for the execution of some effective management techniques for managing global teams.

Impact of the internet on project management: Introduction – the effect of internet on project management –managing projects for the internet- effect on project management activities.

REFERENCE BOOKS

1. Gobalswamy Ramesh, “Managing Global Software Projects”, Tata McGraw Hill Publishing Company, 2003.
2. S.A. Kelkar, “Software Project Management –A concise study”, PHI, 2003
3. Milk Cotterel, Bob Hughes, “Software Project Management”, Inclination / Thomas computer press, 1955.
4. Derrel Ince, H. Sharp and M. Woodman, “Introduction to software project management and quality assurance”, Tata McGraw Hill, 1995.
5. Stephen H. Kan, “Metrices and Models in Software Quality Engineering”, Pearson Education Asia, Second Edition.

ELECTIVE III
Subject Title: EMBEDDED SYSTEMS
Course Number:
Number of Instruction Hours: 4
Subject Description:

This course presents the introduction to embedded systems, Devices and Buses for Device Networks, Program modelling concepts, Inter – process communication & Synchronization of processes, Tasks and threads.

Goal:

To enable the students learns the embedded systems concepts and fundamentals.

Objectives:

On Successful completion of the course the students should have:

- Understood the RTOS concepts.
- Understood the Embedded software Development

UNIT I

Introduction to Embedded Systems: An embedded System – Processor in the system – Other hardware units – software embedded into a system – Exemplary Embedded systems – On chip and in VLSI Circuit. Processor and Memory selection for an Embedded systems.

UNIT II

Devices and Buses for Device Networks: I/O devices – Timer and counting Devices. Device Drivers and Interrupts Servicing Mechanism: Device drivers – Parallel Port device drivers in a system – Serial Port device in a system – Device drivers for internal programmable timing devices – Interrupt servicing mechanism – context and the periods for context-switching, deadline and interrupt latency

UNIT III

Program modeling concepts in single & Multiprocessor systems software- Development Process: Modeling Processes for Software analysis before software Implementation – Programming models for event controlled or response time constrained real time programs – Modeling for microprocessor systems. Software Engineering Practices in the Embedded Software Development Process: Software algorithm complexity – Software Development process life cycle and its models – Software analysis – Software design – Software implementation – Software Testing, Validating and Debugging – Real time programming issues during the software development process – Software project management – Software maintenance – UML.

UNIT IV

Inter – process communication & Synchronization of processes, Tasks and threads: Multiple processes in an application – Problem of sharing data by multiple tasks and routines – Inter Process communication.

REAL TIME OPERATING SYSTEM:- Real time and Embedded systems operating systems – Interrupt routines in RTOS environment – RTOS Task scheduling models, Interrupt latency and Response times of the Tasks as performance Metrices – performance Metric in scheduling models for periodic, sporadic and Aperiodic Tasks – IEEE standard POSIX 1003.1b functions for Standardization of RTOS and Inter-task communication functions – List of Basic

actions in a preemptive scheduler and Expected times taken at a processor – Filters – point strategy for synchronization between the processes, ISRs, OS functions and tasks and for Resource management – Embedded Linux Internals

UNIT V

Hardware – Software co-design in an embedded System: Embedded System Project Management – Embedded system design and co-design issues in system development processes – Design cycle in the development phase for an Embedded system – Uses of Target system, or its Emulator and In-circuit Emulator – Use of software tools for development of an embedded system – Use of scopes and logic analysis for system hardware tests – Issues in Embedded system design

Case Study: An Embedded System for an Adaptive cruise control system in a car, embedded system for a smart card.

REFERENCE BOOKS

1. Raj Kamal, “Embedded Systems – Architecture, programming and design”, Tata Mcgraw – Hill, 2003.
2. David E. Simon, “An Embedded Software primer” Pearson Education Asia, 2003.

ELECTIVE III
Subject Title: BIO – INFORMATICS
Course Number:
Number of Instruction Hours: 4
Subject Description: This course presents an introduction to bioinformatics, Genome information resources, data base searchers and pair wise alignment, multiple sequence alignment, RNA structure, proteomics.
Goal: To enable the students learns the bioinformatics concepts and fundamentals.
Objectives:

On successful completion of the course the students should have:

- Understood the bioinformatics and Genome information resources.
- Understood the pair wise alignment, multiple sequence alignment, RNA structure, proteomics.

UNIT I

Introduction – Importance of Bioinformatics – Biological Sequence / Structure – Deficit – Genome Projects – Status – Sequence analysis – Homology and analogy. EMBNET – NCBI – Virtual Tourism. Primary Sequence Databases: Biological data base – Primary Sequence Database – Composite Protein Sequence Database – Secondary database – Composite protein – Pattern database – structure and classification of database.

UNIT II

Genome Information Resources. DNA Sequences data base – Specialised genomic Resources. DNA Sequence analysis. Why analyse DNA? – Gene structure – Features of DNA sequence analysis – Issues in the interpretation and EST search – Approach of Gene hunting – Cell CDNA libraries and ESTs – Approaches to EST analysis – Effect of EST data on DNA data base examples of EST analysis.

UNIT III

Data Base Searchers and Pair Wise Alignment : Data base searching – Alphabets and Complexity – Comparing Two Sequences – Sub-Sequence – Identity and Similarity – Dot plots – Simple alignment – Gaps – Scoring Matrices – Dynamic Programming – BLAST and its relative – FASTA and related algorithms – Alignment scores and statistical significance of database sequences.

Global and local Alignments: Algorithms – Similarities – Semi global alignment.

UNIT IV

Multiple Sequence Alignment: Goal – Definition – Consensus – Complex – Methods – Database of multiple Alignment – searching database with multiple alignment. Methods of Photo Genetics : Distance Based Methods – Based Methods – Comparison.

UNIT V

RNA Structure : Amino Acids – Polypeptide Composition Algorithm – Modeling protein folding prediction – RNA Sequence Structure.

Proteomics: Classification – Techniques – Inheritors – Drying Design – Structures – X-Ray Crystal – NMR – Empirical Methods and prediction techniques.

REFERENCE BOOKS

1. T.K. Attwood, D.J. Parry-Smith, “Introduction to Bioinformatics”, Pearson Education Asia, 2003.
2. Dan E. Krane, Michale L. Raymer, “Fundamental Concepts of Bioinformatics”, Pearson Education Asia, 2003.

ELECTIVE IV
Subject Title: WAP & XML
Course Number:
Number of Instruction Hours: 4
Subject Description:

This course presents the rise of mobile data, the wireless mark up language, user interface design, and wireless telephony applications.

Goal:

To enable the students learns mobile concepts, WML and applications.

Objectives:

On successful completion of the course the students should have:

- Understood clearly the principles of WAP & XML**.**

UNIT I

The Rise of Mobile Data: Market Convergence Enabling Convergence – Key Services for the Mobile Internet. Overview of the Wireless Application Protocol: The Origins of WAP – Overview of the WAP Architecture – Components of the WAP Standard – Network Infrastructure Services Supporting WAP Clients – WAP Architecture Design Principles – Relationship to Other Standards.

UNIT II

The Wireless Markup Language: Overview – The WML Document Model – WML Authoring – URLs Identify Content – Markup Basics – WML – Basics – Basic Content – Events, Tashs and Bindings

UNIT III

Variables – Other Content you can Include – Controls – Miscellaneous Markup – Sending Information – Application Security – Other Data: The Meta Element – Document Type Declarations – Errors and Browser Limitations – Content Generation – WML Version Negotiation.

UNIT IV

User Interface Design: Making Wireless Applications, Easy to Use: Web Site Design: Computer Terminals Vs Mobile Terminals – Designing a Usable WAP Site – Structured Usability Methods – User Interface Design Guidelines – Design Guidelines for Selected WML Elements.

UNIT V

Wireless Telephony Applications: Overview of the WTA Architecture – WTA Client Framework – WTA Server & Security – Design Considerations – Application Creation Toolbox – Future WTA Enhancements.

The Mobile Internet Future: Better Content, Easier Access – Beyond Browsing – Beyond Cellular – Mobile Data Unleashed.

REFERENCE BOOKS

1. Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Daniel Mauney, Jari Alvinen, David Bevis, Jim Chan, Stefan Hild, “The Wireless Application Protocol”, Pearson Education, 2003.

ELECTIVE IV
Subject Title: E-COMMERCE
Course Number:
Number of Instruction Hours: 4
Subject Description:
This course presents the introduction to E-Commerce, Network Infrastructure, Information publishing technology, Securing network transaction, search engines.
Goal:
To enable the students to learn the basic functions, principles and concepts of E-Commerce.
Objectives:
On successful completion of the course the students should have:

- Understood the E-Commerce framework

UNIT I

Electronic Commerce framework – Electronic Commerce of Media convergence- The Anatomy of E-commerce applications – Electronic Commerce Applications – Electronic Commerce Organization Applications – Masket Forces Influencing the I-way – Components of the I-way – Network Access Equipment – the Last Mile: Local roads and access Ramps – Global Information Distribution Networks – Public policy Issues shaping the I-way

UNIT II

Architectural framework for electronic commerce – World Wide web (WWW) as the architecture – Web background: Hypertext publishing – Technology behind the web – security and the web – Consumer-oriented applications – Mercantile models from the consumer's perspective – Mercantile models from the Merchant's Perspective

UNIT III

Types of Electronic payment systems – Digital Token-Based Electronic Payment Systems – Smart cards and Electronic Payment Systems – Credit Card based Electronic Payment systems – Risk and Electronic Payment Systems – Designing electronic payment systems - Electronic data interchange – EOI Applications in Business – EDI: Legal, Security, and Privacy issues – EDI and Electronic Commerce.

UNIT IV

Internal Information systems – Macroforces and Internal Commerce – Work Flow Automation and Coordination Customization and Internal commerce – Supply chain commerce systems – making a business case for a document Library – Types of digital documents – Issues behind Document Infrastructure – corporate Data warehouses.

UNIT V

The New Age of Information-Based Marketing – Advertising on the Internet- charting the Online Marketing process – Market Research – Search and Resource Discovery Paradigms – Information search and Retrival – Electronic commerce Catalogs or Directories – Information Filtering – Consumer – Data Interface Emerging Tools.

REFERENCE BOOKS

1. Ravi Kalakota, Andrew B. Whinston, " Frontiers of Electronic Commerce", Pearson Education Asia, 2003.
2. Jeffery F. Rayport, Bernard J. Jaworski, "E- Commerce", TMCH, 2002.
3. P.T. Joseph, "E- Commerce – A Managerial Perspective", PHI, 2003.

ELECTIVE IV
Subject Title: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS
Course Number:
Number of Instruction Hours: 4
Subject Description:

This course presents the introduction to Problem solving and AI, state space search methods, problem reduction, predicate calculus in problem solving, expert systems.

Goal:

To enable the students to learn the basic functions, principles and concepts of Artificial intelligence and expert systems

Objectives:

On successful completion of the course the students should have:

- Understood the Artificial intelligence and expert systems
- Learnt the Heuristic techniques and reasoning

UNIT I

Introduction: AI Problems - Al techniques - Criteria for success. Problems, Problem Spaces, Search: State space search - Production Systems - Problem Characteristics - Issues in design of Search.

UNIT II

Heuristic Search techniques: Generate and Test - Hill Climbing- Best-First, Problem Reduction, Constraint Satisfaction, Means-end analysis. Knowledge representation issues: Representations and mappings -Approaches to Knowledge representations -Issues in Knowledge representations - Frame Problem.

UNIT III

Using Predicate logic: Representing simple facts in logic - Representing Instance and Isa relationships - Computable functions and predicates - Resolution - Natural deduction. Representing knowledge using rules: Procedural Vs Declarative knowledge - Logic programming - Forward Vs Backward reasoning - Matching - Control knowledge.

UNIT IV

Statistical reasoning – Knowledge representation – Planning– Understanding.

UNIT V

Learning – Common sense – Perception and Action – Expert System.

REFERENCE BOOKS

1. Elaine Rich and Kevin Knight," Artificial Intelligence", Tata McGraw Hill Publishers company Pvt Ltd, Second Edition, 1991. (chapters 1-6 only).
2. George F Luger**,** "Artificial Intelligence",4th Edition, Pearson Education Publ,2002.

COMPULSORY DIPLOMA IN WEB APPLICATIONS (DWA)

PAPER I : Web DESIGNING

(for the candidates admitted during 2007-08 batch only)

Subject Title : Web Designing
Course Number:
Number of Instruction Hours: 3 **No. of credits : 4**
Subject Description

This Course presents the basics of Web designing.

Goals:

To enable the students to learn the Programming Languages for Web designing **Objectives :**
On successful completion of the course the students should have:

- Understood the fundamentals of Web design and how to program using ASP and XML.

Contents

UNIT I

Basics of Web Technology: Web page creation- Scripting Language - HTML Tags – VBScript- JavaScript- Looping -Array handling -Functions and Procedures - Object creation - Validating Form Elements;

UNIT II

ASP : Active Server Pages- Server Side Scripting- Servers : IIS, PWS _ ASP Objects – Request- Response- Session- Server- Application objects- globel.asa file - Cookies - External & Internal cookies.

UNIT III

ASP Components - Ad Rotator- Context Rotator- Browser Capability- Page counter - Server objects- Database connectivity - DSN -Retrieving information from table - Manipulating records in tables. Implementation of ASP concepts in .NET environment.

UNIT IV

XML :XML essentials - XML Documents - Valid Documents- Entities and attributes - Cascade Style Sheets - XML Scheme - Handling XML Documents and Data Binding.

UNIT IV

XML DOM - XSL Transformations - XSL Formatting Objects - XML and ASP- XML and Servlets - XML and Perl- WML

REFERENCE BOOKS:

1. Steven Holzner – “Inside XML “, 2000 Edition, Techmedia Publishers.
2. “Unleashed ASP”- Techmedia Publisher.
3. “Interactive VBScript” – Techmedia Publishers.

Paper II : WEB SERVICES

Subject Title : Web Services
Course Number:
Number of Instruction Hours: 3 Number of Credits : 4
Subject Description
This Course presents the Web Services Provided.
Goal : To enable the students to learn what is web service and Protocols used for Web services
Objective
On successful completion of the course the students should have:

- Understood how to build the real world applications using Web Services.

Contents

Unit I

Introduction to Web Services – Industry standards, Technologies and Concepts underlying Web Services – their support to Web Services, Applications that consume Web Services.

Unit II

XML – its choice for Web Services – Network protocols to backend databases – Technologies – SOAP, WSDL – exchange of information between applications in distributed environment – Locating remote Web Services – its access and usage, UDDI Specification – an introduction.

Unit III

A brief outline of Web Services – Conversation – static and interactive aspects of system interface and its implementation, Work Flow – Orchestration and refinement, Transactions, Security issues – the Common attacks – security attacks facilitated within Web services Quality of Services – Architecting of systems to meet users requirement with respect to latency, performance, reliability, QOS metrics, Mobile and wireless Services – energy consumption, network bandwith utilization, Portals and Services Management.

Unit – IV

Building real world Enterprise applications using Web Services – sample source codes to develop Web Services – Steps necessary to build and deploy Web Services and Client applications to meet Customer's requirement – Easier development, Customisation, maintenance, Transactional requirements, seamless porting to multiple devices and platforms.

Unit – V

Development of Web Services and applications onto Tomcat application Server and Axis SOAP server (both are freewares) – Web Services Platform as a set of Enabling technologies for XML based distributed Computing.

REFERENCE BOOKS :

1. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services: An Architects Guide", Prentice Hall, Nov 2003
2. Keith Ballinger, "NET Web services: Architecture and Implementation with .Net", Pearson Education, First Education Feb 2003.
3. Ramesh Nagappan, Developing Java Web Services: Architecting and developing secure Web Services Using Java", John Wiley and Sons, first Edition Feb 2003
4.Eric A Marks and Mark J Werrell, "Executive Guide to Web services", John Wiley and sons, March 2003
5.Anne Thomas Manes, "Web Services: A managers Guide" Addison Wesley, June 2003.

Paper III : ASP. NET

Subject Title : ASP.NET
Course Number:
Number of Instruction Hours: 3 Number of Credits : 4
Subject Description
This Course presents the Introduction to ASP.NET programming.
Goals
To enable the students to learn what is ASP.NET fundamentals, Components & Web forms
Objective
On successful completion of the course the students should have:

- Understood how to build the applications using ASP.NET.

Contents

Unit I

Getting Setup - what is ASP.NET- Setting up for ASP.NET- The development environment – ASP & ASP.NET. An overview – ASP.NET Programming Languages. Programming Basics: Basics of Programming - Program Flow – Effective Coding Techniques –Designing Applications.

Unit II

How Dynamic Website Applications work- Processing ASP.NET with Visual basic. NET:VB.NET Programming Language Structures –Built in ASP.NET objects & Interactivity- The response object –The ASP Server object.

Unit III

Web forms & ASP.NET:

Web forms- ASP.NET Configuration, Scope and State: ASP.NET and configuration- ASP.NET and state –The application object –ASP sessions – The session object.

Unit IV

ASP.NET objects and components:

The Scripting Object Model- Active Server Components and Controls –More Active Server Components.

Unit V

Web services & ASP. NET –WSDL & SOAP- Web services Background – ASP.NET &SQL server- using SQL server –using databases in ASP.NET applications- ActiveX data objects- the ADO.NET objective model –coding structured query language.

REFERENCE BOOKS:

1.Dave Mercer, “ASP. NET A Beginner’s Guide”, Tata McGraw –Hill Pub. Company Ltd, 2002
2.Matt J. Couch, “ASP. NET and VB. NET Web programming “, Pearson Education, 2002.
3..Kirk Allen Evans, Ashwin Kamanna, Joel Mueller, “XML and ASP.NET”, Pearson Education, 2002.

Paper IV : ASP.NET PROGRAMMING LAB

Subject Title : ASP.NET PROGRAMMING LAB
Course Number:
Number of Instructional Hours:3 Number of Credits : 4
Subject Description
This course provides the introduction to .NET programming.
Goal :
To enable the students to learn about the development of web based applications using ASP.NET.
Objectives :
On successful completion of the course the students must have

- understood the basics of .NET programming
- got the skill of developing Web Applications
- knowledge to develop database applications in .NET environment.

REFERENCE BOOKS:
1.Dave Mercer, “ASP. NET A Beginner’s Guide”, Tata McGraw –Hill Pub. Company Ltd, 2002
2..‘Beginning ASP.NET 2.0’ by Chris Hart.

MODEL QUESTION PAPERS

I – SEMESTER

INTRODUCTION TO INFORMATION TECHNOLOGY

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is meant by Information?
2. Define Numeric Data
3. What is meant by pixel?
4. Define Multimedia.
5. What is the use of RAM.
6. List the any two output devices.
7. What is meant by Internet Working.
8. Define protocols.
9. What is meant by hyper link?
10. What is the use of HTML?.

SECTION B (5 * 5 = 25)

11. a) Explain the types of data? (OR)
    b) Explain the representation of characteristics in computer.
12. a) How the pictures are stored on digital camera . (OR)
    b) Explain acquiring audio data and its format.
13. a) Explain about ROM memory device and its various types. (OR)
    b) Draw the functional block diagram of CPU.
14. a) State the importance of computer Networks (OR)
    b) State the uses of Routers.
15. a) What is the necessity of E-Mail? (OR)
    b) Explain the use of computer in business

SECTION C (5 * 8 = 40)

16. a) With block diagram, explain the simple model of the computer. (OR)
    b) Describe the arrangement of data acquisition system.
17. a) Describe image compression fundamental in details. (OR)
    b) Discuss in detail about processing of multimedia data
18. a) With block diagram, explain how read write operations are performed in a RAM. (OR)
    b) Explain the working principles of CD-ROM.
19. a) Write an essay on open system inter connection model (OR)
    b) Explain in detail about inter connection tools in computer networks
20. a) Briefly explain about information browsing service (OR)
    b) Discuss in detail about design of operations information system

I – SEMESTER

COMPUTER ORGANISATION AND ARCHTIECTURE

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Define instruction codes.
2. What do you mean by three – state bus buffer?
3. Define binary incrementer.
4. What do you mean by accumulator?
5. Define interrupt cycle.
6. Define DMA controller.
7. What do you mean by bit oriented protocol?
8. Define auxiliary memory.
9. What do you mean by pipelining?
10. RISC stands for _____

SECTION B (5 * 5 = 25)

11. a) Explain timing and control in detail. (OR)
b) Write notes on bus and memory transfer.

12. a) Write notes on interrupt. (OR)
b) Explain in detail about accumulator logic.

13. a) Write notes on bus scheduling. (OR)
b) Explain in detail about peripheral devices.

14. a) Write notes on virtual memory. (OR)
b) Explain in detail about memory management.

15. a) Write notes on memory interleaving. (OR)
b) Explain SIMD array processor.

SECTION C (5 * 10 = 50)

16. a) Write notes on:
(i) Register transfer language.
(ii) Instruction codes. (OR)
b) Explain in detail about logic micro – operation.

17. a) Explain in detail about design of basic computer. (OR)
b) Write notes on input-output configuration, input-output instruction and program interrupt.

18. a) Draw the diagram of input output interface and explain in detail. (OR)
b) Explain in detail about asynchronous data transfer.

19. a) Explain in detail about auxiliary memory. (OR)
b) Discuss the differences between cache memory and main memory.

20. a) Explain in detail about vector processing. (OR)
b) Discuss in detail about MIMD.

I – SEMESTER

PROBLEM SOLVING AND PROGRAMMING IN C

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (1*10=10)

1. Give the flowchart symbol for the input and output
2. Name the basic components of a computer
3. Name the four basic data types in C
4. What is an escape sequence?
5. What is a prototype?
6. Differentiate arrays and structures
7. What is meant by opening a datafile?
8. What is the purpose of fopen?
9. What is meant by bitwise operations?
10. What is a pointer?

SECTION B (5 * 5 =25)

11. a) What is the use of flowchart? (or)
    b) What are the advantages of modular programming?
12. a) Write short notes on if-else(or)
    b) Write short notes on operator precedence
13. a) Write a program to find greatest among N numbers (or)
    b) In which situation function arguments are passed as pointers? Explain
14. a) Write a program to check the palindrome (or)
    b) Differentiate unions and structures
15. a) What are the common programming errors?
    b) Write about CMOS

SECTION C (5 * 8 =40)

16. a) What are the steps involved in software development? (or)
    b) What is technique of a good programming?
17. a) Explain switch statement (or)
    b) Explain gets and puts
18. a) Write a program to reverse a number (or)
    b) How can u return more values from a function?
19. a) State merits and demerits of pointers (or)
    b) Explain the unconditional, conditional statement
20. a) Explain the file concept with example (or)
    b) Discuss the various standard system functions

M.C.A DEGREE EXAMINATION

I – SEMESTER

NUMERICAL ALGORITHMS & STATISTICS

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. If the rank of matrix A is r, then the determinant of every (r+1) * (r+1) sub matrix is zero-state True or False
2. Convert $y = \frac{x}{a+bx}$
3. The process of finding the value of a function inside a given range is called----------
4. Express $(\Delta^2 -3\Delta+2)y^n=0$ in terms of operator E.
5. What is the Order of convergence of Newton Rapshon method.
6. Locate the negative root of $x^2-2x+5=0$ approximates.
7. The algebraic sum of the deviations of a set of values from their medium is zero-True or False?.
8. Write down the formula for rank correlation.
9. When do you say that two events are independence?
10. State addition theorem probabilities

SECTION B (5 * 5 = 25)

11. a) Find the rank of the matrix A=

$$\begin{bmatrix} 3 & -1 & 2 \\ 0 & 1 & -3 \\ 6 & -1 & 1 \end{bmatrix}$$

(OR)

b) Explain the method of fitting a curve of the form $y= ax^b$ by the method of least squares.

12. a) Evaluate $\frac{\Delta^2}{E} ex.$ $\frac{Eex}{\Delta^2 e^x}$ (OR)

.b) Evaluate $(\Delta + \nabla)^2 (x^2+x)$

13. a) Explain the Bisection method of finding the a root of equation f(x)=0 (OR)

b) Explain Gauss –Seidel iterative procedure for solving a system of linear equations

14. a) Explain the different measures of dispersion (OR)

b) Prove that -1 <= r <= 1 where r is the correlation coefficient.

15. a) If A and B are independent events prove that A and B are also independent

(OR)

b) Define uniform distribution over (a, b) and find its mean

SECTION C (5 * 8 = 40)

16. a) Find the condition on a, b, c so that the equations x+2y-3z=b, 3x-y+2z=b,x-5y+8z=c have a solution (OR)

b) Fit a curve of the form $y=ae^{bx}$ for the following data: .

X:	0	2	1
Y:	5.012	10	31.62

17. a) The following table gives the population of a town during the last six census. Estimate the using Newton's interpolation formula, the increase in the population during the period 1946 to 1948.

Year :	1911	1921	1931	1941	1951	1961
Populations :	12	13	20	27	39	52

(OR)

b) Calculate $\frac{dy}{dx}$ and $\frac{dy^2}{dx^2}$ at x=1.35 from the following data:

X:	1.1	1.2	1.3	1.4	1.5	1.6
Y:	-1.62628	0.15584	2.45256	5.39168	9.125	13.83072

18. a) Solve the Gauss-Elimination method.

$$X_1-x_2+x_3 = 1$$
$$-3x_1+2x_2-3x_3 = -6$$
$$2x_1-5x_2+4x_3 = 5$$

(OR)

b) Compute the real root of $x\log_{10}x=1.2$ correct to three decimal places using Newton Rapshon method

19. a) Obtain the rank correlation coefficient for the following data:

X:	68	64	75	50	64	80	75	40	55	64
Y:	62	58	68	45	81	60	68	48	50	70

(OR)

c) Given that X=4Y+5 and Y=KX+4 are the lines of regression of X on Y and Y on X respectively .Show that 0<4k<1. If K = 1/6, find the means of two variables and the correlation between them.

20. a) In a bolt factory machines A, B and C manufacturer respectively 25%, 35% and 40% Of the total of their output 5, 4, 2 percents are defective bolts. A bolt is drawn at random and is found to be defective. What are the probabilities that it was manufactured by the machine A , B and C?

(OR)

b) Fit a passion distribution to the following data:

X:	0	1	2	3	4	5	6	7	8
F:	56	156	132	97	37	22	4	0	1

I – SEMESTER

ACCOUNTING AND FINANCIAL MANAGEMENT

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Wages paid to Ram for erection of machinery is debited to
   (a) Ram A/c (b) Wages A/c
   (c) Machinery A/c (d) Cash A/c
2. Closing Stock must be shown in
   (a) Profit and Loss A/c (b) Trading A/c and Balance Sheet
   (c) Not in the above
3. Accrued income is an item of
   (a) Asset (b) Liability (c) Neither of the two
4. Current Assets include
   (a) Cash and Bank Balance (b) Machinery
   (c) Furniture (d) All the above
5. Which of the following is not a source of fund
   (a) Purchase of Machinery (b) Profit earned during the year
   (c) Issue of capital (d) Long term loans raised
6. Sales Budget is a
   (a) Functional Budget (b) Master Budget (c) Expenditure Budget
7. Variable cost per unit
   (a) Remains Fixed (b) Fluctuates with the volume of production
   (c) Varies oppositely with Volume of production (d) Varying according to periods
8. At BEP
   (a) Contribution exceeds Fixed cost (b) Contribution equals Fixed cost
   (c) Fixed cost exceeds Contribution (d) None of the above
9. What is Working Capital?
10. What is meant by Fixed Expenses?

SECTION B (5 * 3 = 15)

11 a) Define the term accounting and State the objectives of financial accounting.(OR)
   b) From the following calculate the Gross Profit.

Opening Stock	Rs. 40,000
Closing Stock	Rs. 65,000
Carriage inwards	Rs. 5,000
Sales	Rs. 1,50,000
Wages	Rs. 18,000

12. a) How do you test the liquidity of a firm? (OR)
    b) Calculate Current Assets from the following :
    Current Ratio 1.5 : 1
    Current Liabilities Rs. 90,000

13 a) Differentiate between Funds Flow and Cash Flow Statement. (OR)
    b) Find the Funds from operation from the following :
    Profit and Loss A/c 1.1.2004 - Rs. 18,000
    31.12.2004 - Rs. 58,500
    Loss on sale of machine Rs. 8,000
    Depreciation Rs. 20,000
    Dividend Income Rs.30,000.

14 a) Explain the classification of budget. (OR)
    b) Prepare a production budget for three months ending March 31, 1999 for a factory producing four products, on the basis of the following information:

Type of Product	Estimated Stock on Jan 1, 1999 (Units)	Estimated Sales during Jan-Mar (Units)	Desired Closing Stock on Mar 31, 1999 (Units)
A	2,000	10,000	5,000
B	3,000	15,000	4,000
C	4,000	13,000	3,000
D	5,000	12,000	2,000

15 a) From the following information relating to Quick Standards Ltd,. You are required to find out a) P/V Ratio b) Break-Even Point c) Profit
    Total Fixed Costs Rs. 4,500
    Total Variable Costs Rs. 7,500
    Total Sales Rs. 15,000 (OR)

    b) Prepare a Cost Sheet from the following details :
    Direct Materials Rs. 10,000
    Direct Labour Rs. 4,000
    Direct Expenses Rs. 500
    Factory Expenses Rs. 1,500
    Administrative Expenses Rs. 1,000
    Selling Expenses Rs. 300
    Sales Rs. 20,000

SECTION C (5 * 10 = 50)

16. a) Compare Single Entry with Double Entry System of Book-keeping. (OR)

b) From the details given by Mr. Arul, Prepare Final Accounts for 31st Dec 1997.

Particulars	Debit (Rs)	Credit (Rs)
Land	4,000	
Opening Stock (1.1.97)	4,000	
Machinery	6,600	
Purchases	13,000	
Wages	3,500	
Interest paid	1,300	
Cash	230	
Debtors	8,000	
Purchase Returns		1,500
Bills Payable		700
Capital		15,000
Bills Receivable	1,500	
Sales		22,000
Rent	1,270	
Furniture	300	
Creditors		6,000
Drawings	500	
Sales Return	1,000	
	45,200	45,200

Adjustments: a) Closing Stock (31.12.97) was Rs. 4,500
b) Outstanding Rent Rs.130

17. a) Explain the procedure for the preparation of Funds Flow Statement. (OR)

c) The Balance Sheets of SUN Ltd for the year ended 31st December 2003 and 2004 were as follows :

Liabilities	2003	2004	Assets	2003	2004
Share Capital	80,000	1,20,000	Premises	55,400	1,13,200
Share Premium	8,000	12,000	Plant and Machinery	36,500	51,300
General Reserve	6,000	9,000	Furniture	2,400	1,500
Profit & Loss A/c	19,500	20,800	Stock	22,100	26,000
5% Debentures	-	26,000	Debtors	35,600	39,100
Income tax Provision	9,800	10,900	Bank	4,800	4,000
Creditors	33,500	36,400			
	1,56,800	2,35,100		1,56,800	2,35,100

Depreciation written off during the year 2004 was as under

Plant and Machinery - Rs. 12,800
Furniture - Rs. 400

Prepare a statement of sources and uses of funds.

18 a) What do you understand by Ratio Analysis. Explain the advantages and Disadvantages of Ratio Analysis. (OR)

b) The following information of a company is given :

Current Ratio 2.5 : 1
Acid-test Ratio 1.5 : 1
Current Liabilities Rs.50,000.

Find out a) Current Assets b) Liquid Assets c) Inventory

19 a) What is Budgetary Control. Explain its advantages and disadvantages (OR)

b) The Budgeted Expenses for the production of 10,000 units in a factory are furnished below

	Per unit (Rs.)
Materials	70
Labour	25
Variable Overheads	20
Fixed Overheads (Rs. 1,00,000)	10
Direct variable Overhead	5
Selling Expenses (15% Fixed)	13
Distribution Expenses (20% Fixed)	7
Administrative Expenses (Rs. 50,000)	5
	155

Prepare a budget for the production level of 8,000 units.

20 a) Define Cost Accounting. Discuss the advantages and limitations of Cost Accounting. (OR)

b) B Corporation Limited has prepared the following budget estimates for the year 2004-05.

Sales (Units) 15,000
Fixed Expenses 34,000
Sales (Rs.) 1,50,000
Variable cost per unit Rs. 6

Find a) P/V Ratio b) Break Even Point c) Margin of Safety
d) Sales required to earn a profit of Rs. 34,000
e) Profit at a Sales level of Rs. 2,00,000.

II – SEMESTER

DATA STRUCTURES & ALGORITHMS

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is the primitive data structure?
2. State the use of priority queue.
3. Give any two applications of stack.
4. What is meant by linked list?
5. What are the ways to represent binary tree?
6. Give the average case time complexity of the heap sort
7. Define the term 'sorting'.
8. What is called hash clash?
9. State the use of indexing technique.
10. What is recursion?

SECTION B (5 * 5 = 25)

11. a) What is a stack? Write an algorithm to insert and delete an element in the stack.
(OR)
b) Write a procedure in C that will reverse the order of the entries in an integer array.
12. a) What is double linked list? How does it differ from singly linked list? (OR)
b) What is meant by sparse matrix representation? Discuss the method it can be represented efficiently?
13. a) Distinguish between internal and external sorting methods. (OR)
b) Write the algorithm for sorting of 'n' numbers using insertion sort.
14. a) Explain indexing techniques. (OR)
b) Write short notes on dynamic tree table.
15. a) Explain the need for using recursion (OR)
b) Write a short note on pattern matching in strings.

SECTION C (5 * 8 = 40)

16. a) What is meant by queue? Explain the operations performed on the queue.(OR)
b) Discuss infix, postfix and prefix expressions with example. How will you convert an infix expression to postfix form?
17. a) What are the operations performed on a singly linked list? Write an algorithm for the same. (OR)
d) Write short notes on: I) Garbage collection II) Compaction.
18. a) Explain merge sort with example. (OR)
b) What is heap sort? Explain with an example.
19. a) Explain briefly about the concept of hashing. (OR)
c) Write a short note on:
(i) Static tree table
(ii) Dynamic tree table.
20. a) Discuss about the Game trees. (OR)
b) Explain the concept of towers of Hanoi problem.

II – SEMESTER

RELATIONAL DATABASE MANAGEMENT SYSTEM

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is physical data independence?
2. Define candidate key?
3. Define cardinality of a relation?
4. What is formula?
5. What is DML?
6. Define Transaction?
7. What is Lossless-join?
8. Expand DES
9. What is meant by pipelined Parameters?
10. What is data skew?

SECTION B (5 * 5 = 25)

11. a) Compare file system versus a DBMS . (OR)
    b) Write short notes on weak entities.
12. a) Describe primary and foreign constraints with suitable examples. (OR)
    b) Explain briefly semantics of TRC queries.
13. a) What is Trigger? How do you create it? Give an Example (OR)
    b) What is schedule? What are the difference types of schedules?
14. a) What is multivalued dependency? Give an example (OR)
    b) Write short notes on different access control.
15. a) Explain briefly different types of distributed DBMS architectures. (OR)
    b) What is Substitution Principle? Give an example

SECTION C (5 * 8 = 40)

16. a) (i) Explain different levels of abstraction in a DBMS
    (ii) Compare entities versus attributes (OR)
    b) Construct an E-R diagram for a university registrar's office. The office maintains data about each class, including the instructors, the enrollment and place of the meetings. For each student-class pair, a grade is recorded. Document that you make about the mapping constraints.
17. a) Explain any five relational algebra operators with suitable examples. (OR)
    b) i) Discuss how do you enforce integrity constraints.
    ii) Write short notes on logical data base design.
18 a) i) Describe the specification of compare integrity in SQL-92
    ii) Explain the characteristics of transaction. (OR)
    b) Discuss lock-based concurrency control in detail.
19 a) Explain BCNF and 3NF with suitable examples (OR)
    b) What is Deadlock? Explain how do you prevent and detect it with suitable examples.

20 a) i) Discuss the architecture of parallel databases
    ii) Compare RDBMS, OODBMS and ORDBMS (OR)
    b) Explain the difference between RDBMS and ORDBMS database design through examples

II – SEMESTER

SYSTEM SOFTWARE AND INTRODUCTION TO OPERATING SYSTEM

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Mention the components of system software.
2. What is the function of the loader
3. What is parsing?
4. What is Relocation?
5. What is a semaphore?
6. What are the process states?
7. What is Deadlock?
8. What is meant by Virtual Memory?
9. What is Uniprocessor Scheduling?
10. Mention any 2 Secondary Storage Devices?

SECTION B (5 * 5 = 25)

11. a) Write a short note on evolution of system software. (OR)
    b) Write short notes on macros.
12. a) Write a short note on the compilation control structures. (OR)
    b) Explain Linkage editing.
13. a) What are the objectives and functions of a operating system. (OR)
    b) Write a note on the use of semaphores as a synchronization tool.
14. a) What are the deadlock detection measures (OR)
    b) Write a short note on Simple paging.
15. a) Discuss on File management. (OR)
    b) What is meant by a directory? – Explain

SECTION C (5 * 8 = 40)

16. a) Explain the design of the two pass assembler. (OR)
    b) Discuss the function of translators and loaders
17. a) Discuss code optimization in detail (OR)
    b) Describe loading, linking and relocation
18. a) Explain in detail principles of concurrency. (OR)
    b) Discuss the evolution of operating system.
19. a) Explain Deadlock avoidance in detail (OR)
    b) Discuss the concept of dynamic partition of memory.
20. a) Explain any 2 scheduling algorithms. (OR)
    b) Explain file sharing on detail.

II – SEMESTER

COMPUTER GRAPHICS

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Define refresh CRT.
2. Write expansion for CAD.
3. What is known as wrap around?
4. Define clipping.
5. What is known as surface rendering?
6. Mention two representation schemes for solid objects.
7. Define cabinet projection.
8. What is known as normalized projection co-ordinate system?
9. Define image space.
10. Define Color model.

SECTION B (5 * 5 = 25)

11. a) Define aspect ratio. (OR)
    b) Differentiate random scan display and raster scan display.
12. a) Briefly write about shear. (OR)
    b) Explain text clipping with an example.
13. a) Discuss briefly about stereoscopic views. (OR)
    b) Write short notes on polygon meshes.
14. a) Briefly discuss about viewing pipeline. (OR)
    b) Write short notes on vanishing point.
15. a) Discuss briefly diffuse reflection. (OR)
    b) Write about key-frame animation.

SECTION C (5 * 8 = 40)

16. a) With neat diagram explain the working principle of CRT. (OR)
    b) Explain the following in detail:
        (i) Properties of Ellipse
        (ii) Flat – panel display
        (iii) Plasma – panel display.
17. a) Explain Cohen Sutherland line clipping algorithm in detail. (OR)
    e) Discuss the logical classification of input devices in detail.
18. a) Explain three dimensional concepts in detail. (OR)
    b) Discuss B-spline curves and surfaces with their properties.
19. a) Write in detail about three dimensional transformation. (OR)
    b) Explain 3D viewing in detail.
20. a) Discuss in detail about scan-line method. (OR)
    b) Explain any three color models in detail.

II – SEMESTER

FOUNDATIONS OF COMPUTER SCIENCE

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Find the sum of eigen values of the matrix $\begin{matrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{matrix}$
2. State Cayley Hamilton theorem.
3. If A={1,2,3} and B={c, d} compute A×B.
4. Let A={1,2,3} and R={(1,2),(1,3),(2,2),(2,3),(3,1),(3,3)} on A. Find R.
5. Define tautology.
6. Express P ∨Q interms of ↓only.
7. Define Euler graph.
8. Define a digraph with an example.
9. Find the language generated by the grammar S → a Sb/ab.
10. Define a finite state automata.

SECTION B (5 * 5 = 25)

11. a) Obtain the inverse of A= $\begin{matrix} 1 & 1 \\ 2 & 1 \end{matrix}$ (OR)

    b) Find the eigen value of $\begin{matrix} 2 & 3 \\ 0 & 4 \end{matrix}$ corresponding to the eigen vector. $\begin{matrix} 1 \\ 0 \end{matrix}$

12. a) Prove that A – (A ∩ B)= A – B. (OR)

    b) Define equivalence relation with an example.

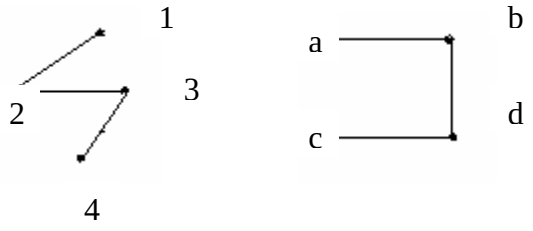
13. a) Show that (P → R) ∧ (Q → R) ⇔ (P ∨ Q) → R. (OR)

    b) Write an equivalent formula for P ⇄ Q interms of ↑ only.

14. a) Show that sum of degrees of the vertices in an undirected graph is even.

(OR)

a. Show that the two graphs shown in figure are isomorphic.



15. a) Construct finite automata accepting the language of the set of all strings in{0,1} with three consecutive 0's.

(OR)

b) Let A= {a, b}, construct an automata M which will accept precisely those words from A which will have even number of b's.

SECTION C (5 * 8 = 40)

16. a) Find the eigen values and eigen vectors of the matrix

$$A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$$

(OR)

b) Using Cayley Hamilton theorem find the inverse of

$$A = \begin{bmatrix} 1 & 1 & 2 \\ 2 & 1 & 4 \\ 3 & 5 & 1 \end{bmatrix}$$

17. a) Simplify the Boolean function F(A,B,C,D)= $\sum$(0,1,2,3,4,5,7,6,8,9,11). (OR)

f) Prove that $5^{2n} - 1$ is divisible by 24 for all n>=1 by mathematical induction.

18. a) Show that $P \rightarrow Q$, $Q \rightarrow \neg R$, R, $P \vee (J \wedge S)$ implies $J \wedge S$. (OR)

b) Obtain pdnf and pcnf of the formula $(\neg P \rightarrow Q) \wedge (Q \Leftrightarrow P)$.

19. a) Show that "A non-empty connected graph G is Eulerian if and only if its vertices are all of even degree".

(OR)

b) Represent the following expression as binary trees and write the prefix and postfix forms of the expression ((A – C) × D) / (A+(B – D)).

20. a) Write the grammar which generates the language L= $\{a^n b^n c^n / n>=1\}$.Mention the type of grammar.

(OR)

b) Let M =($\{q_0,q_1\}$,{0,1}, δ,q_0,$\{q_1\}$) be an NFA where

$\delta(q_0,0) = \{ q_0,q_1\}$ $\delta(q_0,1) = \{ q_1\}$

$\delta(q_1,0) = \emptyset$ $\delta(q1,1) = \{q_0, q_1\}$

III – SEMESTER

OBJECT ORIENTED ANALYSIS DESIGN AND C++

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is an object?
2. What is meant by association?
3. Name any two object oriented features present in C++.
4. List any two operators in C++ that cannot be overloaded.
5. What is the role of destructors in C++ programs?
6. What is an exception? Give an example.
7. What is persistence?
8. What is a Meta class?
9. Write any two string handling functions present in C++.
10. What is polymorphism?

SECTION B (5 * 5 = 25)

11. a) What are invariants? What happens when an invariant is isolated? (OR)
    b) State the difference between strong and weak typing.
12. a) What is Conceptual Clustering . (OR)
    b) What is key abstraction? What way is it useful.
13. a) What are the inputs statements in C++? Give examples. (OR)
    b) Explain in brief the syntax of if-else statements in C++.
14. a) What are pointers? How are pointers initialized in C++? (OR)
    b) State the need for constructors with an example.
15. a) What are Templates? (OR)
    b) When are memory management operators used in C++ programs?

SECTION C (5 * 8 = 40)

16. a) Explain the kinds of relationships among objects. (OR)
    b) Explain the major elements of the object model.
17. a) Describe the approaches to classification. (OR)b)

Explain the following relationships:

i) Inheritance ii) using iii) Instantiation

18. a) Explain the various control structures in C++ with syntax and examples. (OR)
    b) Write a C++ program to check whether a given number is prime or not
19. a) Write a C++ program to overload the '+' operator to add two complex numbers. (OR)
    d) With an example program in C++, explain how a user defined data type is converted to a basic data type
20. a) Explain the concept of polymorphism with an example program in C++. (OR)
    b) Explain the exception handling constructs in C++.

III – SEMESTER

UNIX PROGRAMMING

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is general syntax of chmod?
2. What is a pipe in unix?
3. What are the loop statements available in unix for shell programming?
4. Write down the purpose of sleep and wait commands in shell programming.
5. Write any two low-level function names used to access device drivers.
6. What is the use of lseek system call?
7. What is the purpose of ps command?
8. _____ is the command used to terminate a process in unix.
9. Define semaphore?
10. What is a socket?

SECTION B (5 * 5 = 25)

11. a) Explain ls command with suitable examples. (OR)
    b) Explain unix file structure.
12. a) How conditions can be checked in shell programming? Explain (OR)
    b) Explain different types of operators available in shell programming
13. a) Explain library functions in unix (OR)
    b) Explain scanning directories
14. a) Explain the mechanism of process creation. (OR)
    b) Explain background processing.
15. a) Explain the usage of pipes in unix. (OR)
    b) Explain semaphores in unix

SECTION C (5 * 8 = 40)

16. a) Explain in detail about the (i) vi editor with proper commands (ii) filters (OR)
    b) Write short note on :
    i) File permissions. ii) Redirection.
17. a) Explain control structures in shell programming (OR)
    b) Write a shell program to
    i) To compare two strings ii) test a file for its various attributes
18. a) Explain any few system calls for managing files (OR)
    b) Explain files and directory maintenance.
19. a) Explain the process structure (OR)
    b) Discuss about few signals used in unix
20. a) Explain inter-process communication in unix. (OR)
    b) Explain sockets in unix in detail.

III – SEMESTER

ANALYSIS AND DESIGN OF INFORMATION SYSTEM

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is operational information?
2. Who is Line manager?
3. What is meant by feasibility study?
4. Write down any one main source of information.
5. What is payback method?
6. What is context diagram?
7. What is the use of DFD?
8. What is meant by ambiguous specification in an decision table?
9. What is meant by inter-field relationship check?
10. What is use of coding technique?

SECTION B (5 * 5 = 25)

11. a) Explain why do we need a computer-based information system. (OR)
    b) Write briefly about the goals of materials management.
12. a) Write a note on interviewing technique. (OR)
    b) Explain about the stages in a systems life cycle.
13. a) Differentiate document flow and logical data flow diagrams. (OR)
    b) Explain about the stages in a system life cycle.
14. a) What is meant by extended entry decision table? Explain it is brief. (OR)
    b) Explain how redundant specification can be eliminated from the decision tables, with an example.
15. a) Explain in brief about Modulus – N coding scheme. (OR)
    b) Explain how input data can be validated

SECTION C (5 * 8 = 40)

16. a) Discuss in detail about different types of information. (OR)
    c) Write short note on :
    i) Finance Management ii) Qualities of information.
17. a) Explain in detail about the design of an information system (OR)
    b) Discuss about the attributes of a systems analyst and tools used by him
18. a) Explain in detail about requirements specification with an example (OR)
    b) Discuss about data dictionary.
19. a) Discuss about different conventions used in structured English process description (OR)
    b) Explain in detail about decision table terminology and development.
20. a) Explain about the use of business graphics in designing outputs. (OR)
    b) Discuss about different control techniques used in information systems.

III – SEMESTER

COMPUTER NETWORKS

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Define a computer network.
2. List any two applications of computer networks.
3. List any two error detection and correction techniques.
4. What does the sender's window size represents in sliding window protocol?
5. List any two congestion control methods.
6. Give any two examples of routing algorithms.
7. Why transport layer is called an End-to-End layer?
8. List the functions of transport layer.
9. List any two data compression techniques.
10. What is electronic mail?

SECTION B (5 * 3 = 15)

11. a) explain briefly about network hardware and software. (OR)
    b) Write a brief note on ARPANET.
12. a) what are the characteristics of High Speed LANS? briefly explain. (OR)
    b) Briefly explain the data link layer design issues.
13. a) What are the properties of routing algorithms? Briefly explain. (OR)
    b) What are the factors responsible for congestion to occur in a network? Briefly explain.
14. a) Discuss the relationship between the transport layer and the upper OSI layers. (OR)
    b) Discuss the relationship between the transport layer and the lower OSI layers.
15. a) Write a brief note on domain name system. (OR)
    b) Write a brief note on multimedia

SECTION C (5 * 10 = 50)

16. a) With the help of a neat block diagram explain the functions of different layers in the OSI model. (OR)
    b) Describe in detail about ISDN
17. a) Describe in detail about sliding window protocol (OR)
    b) Explain the salient features of IEEE 802 Standards
18. a) Explain in detail any one adaptive routine algorithm. (OR)
    b) Describe in detail about Internet Working
19 a) Describe in detail the transport service provided by the transport layer. (OR)
    b) Describe in detail about Transport Service provided by the transport layer
20 a) Explain any one encryption technique detail. (OR)
    b) Describe in detail about SNMP.

III – SEMESTER

OPERATIONS RESEARCH

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. A set of values $x_1, x_2, \ldots\ldots x_n$ which satisfies the constrains of the LPP is called the
   (a) solution (b) feasible solution
   (c) optimum solution (d) basic solution
2. Let the constraint of a LPP model is $x_1+x_2 \geq 7$.Then the non-negative variable x_3 which satisfy $x_1+x_2-x_3=7$ is called
   (a) slack variable (b) surplus variable
   (c) artificial variable (d) decision variable
3. A transportation problem is said to be balanced of
   (a) $\sum a_i \neq \sum b_j$ (b) $\sum a_i = 0 \neq \sum b_j$
   (c) $\sum a_i = \sum b_j$ (d) $\sum a_{i=1} \neq \sum b_j$
4. If each entry is increased by 3 in a 4 × 4 assignment problem, what is the effect in the optimal value?
   (a) Increased by 12 (b) Increased by 16
   (c) Increased by 9 (d) Increased by 12
5. How many costs involved in inventory?
   (a) 3 (b) 4 (c) 2 (d) 5
6. EOQ decreases when the cost of item
   (a) decreases (b) increases
   (c) increases by one time (d) increases by two time
7. Choose the correct answer. Replacement of an existing machine aims at
   (a) more automation and lesser dependence on workmen.
   (b) reduction in the annual capital cost.
   (c) lower average annual cost of using the machine.
8. If the standard deviation of the critical activities in a project are 2, 3 and 6, then the standard deviation of the critical path is
   (a) 7 (b) 5 (c) 3 (d) 6
9. m/m/I model is known as
   (a) Poisson model (b) Birth death model
   (c) Exponential model (d) Multiserver model
10. The utilization factor under multiserver model is
   (a) $\lambda/s\mu$ (b) λ/μ (c) λ/μ' (d) λ'/μ

SECTION B (5 * 5 = 25)

11. a) Express the following LPP in the standard form.

$$\text{Max } z = 8x_1+5x_2$$

Subject to

$$2x_1+x_2 \leq 500,$$
$$x_1 \leq 150,$$
$$x_2 \leq 250,$$
$$x_1, x_2 \geq 0.$$

(OR)

b) Write the dual of the following LPP:

Max $z = 6x_1+4x_2+3x_3$

Subject to

$2x_1+4x_2+3x_3 \leq 20,$

$x_1+3x_3 \leq 15,$

$3x_2+5x_3 \leq 60,$

$x_3 \leq 10,$

$x_1, x_2, x_3 \geq 0.$

12. a) Find the initial basic feasible solution for the following transportation problem by North West Corner rule.

	X	Y	Z	Supply
I	1	2	6	**7**
II	0	4	2	**12**
III	3	1	5	**11**
Demand	10	10	10	

(OR)

b) Describe the mathematical formulation of an assignment problem.

13 a) Explain briefly lead time and reorder level. (OR)

b) A company uses annually 50,000 units of an item each costing Rs.1.20. Each order costs Rs.45 and inventory carrying costs are 15% of the annual average inventory value. Find EOQ.

14 a) Write a short note on replacement situations. (OR)

b) Construct the network for the project whose activities and their precedence relationships are given below:

A<C, D, I;B<G, F; D<G, F; F<H, K; G,H<J; I, J < E.

15. a) Explain Transient and steady states. (OR)

b) In a railway yard, goods train arrive at a rate of 30 trains per day.Assuming that inter arrival time follows an exponential distribution and the service time distribution is also exponential, with an average of 36 minutes. Calculate the mean queue size.

SECTION C (5 * 8 = 40)

16. a) Using graphical method to solve the following LPP:

Minimize $z = 3x_1+2x_2$

subject to

$5x_1+x_2 \geq 10,$
$x_1+x_2 \geq 6,$
$x_1+4x_2 \geq 12,$
$x_1, x_2 \geq 0.$

(OR)

b) Solve the LPP:

Minimize $z = 3x_1 - x_2$
subject to
$2x_1+x_2 \geq 2,$
$x_1+3x_2 \leq 3,$
$x_2 \leq 4,$
$x_1, x_2 \geq 0.$

17. a) Determine the optimum solution to the following transportation problem:

	D_1	D_2	D_3	D_4	Capacity
O_1		2	3	4	**6**
O_2		3	2	0	**8**
O_3		2	2	1	**10**
Demand	4	6	8	6	

(OR)

g) Find the optimal assignment for the problem with the given cost matrix.

	I	II	III	IV
A	5	3	1	8
B	7	9	2	6
C	5	4	5	7
D	5	7	7	6

18 a) The annual demand for a product is 1,00,000 units. The rate of production is 2,00,000 units per year. The set up cost per production run is Rs.5,000 and the variable production cost of each item is Rs.10. The annual holding cost per unit is 20% of the value of unit. Find the optimum production lot-size, the length of production run.

(OR)

b) Find the optimal order quantity for a product for which the price-break is as follows:

Quantity	Unit cost
$0 \leq Q_1 < 50$	Rs.10
$50 \leq Q_2 < 100$	Rs.9
$100 \leq Q_3$	Rs.8

The monthly demand for the product is 200 units , the cost of the storage is 25% of the unit cost and ordering cost is Rs.20.00 per order.

19 a) A machine owner finds from his past records that the costs per year of maintaining a machine whose purchase price is 6000 are as given below:

Year :	1	2	3	4	5	6	7	8
Maintenance cost :	1000	1200	1400	1800	2300	2800	3400	4000
Resale price :	3000	1500	750	375	200	200	200	200

(OR)

b) The following table list the jobs of a network along with their time estimates:

Jobs :	1 – 2	1 – 3	2 – 4	3 – 4	4 – 5	3 – 5
Optimistic time :	2	9	5	2	6	8
Most likely time :	5	12	14	5	6	17
Pessimistic time :	14	15	17	8	12	20

Calculate the length and variance of the critical path.

20 a) In a super market, the average arrival rate of customer is 10 in 30 minutes following Poisson process. The average time taken by the cashier to list and calculate the customer's purchases is 2.5 minutes following exponential distribution. What is the probability that the queue length exceeds 6? What is the expected time spent by a customer in the system?

(OR)

b) People arrive at a theatre ticket both in Poisson distributed arrival rate of 25 per hour. Service time is constant at 2 minutes. Calculate (i) The mean number in the waiting line. (ii) The mean waiting time (iii) The utilization factor.

IV – SEMESTER

VISUAL PROGRAMMING

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is a handle in window programming?
2. DDE is ----------.
3. State the advantage of using 'double precision' data type in VB.
4. What is a form?
5. What is tree view?
6. What is data control?
7. What is an Accelerator?
8. What is a Bitmap?
9. What is ODBC?
10. What is a table?

SECTION B (5 * 5 = 25)

11. a) Write a note on DLL. (OR)
    b) Write about windows registry.
12. a) Explain briefly date function in VB. (OR)
    b) Write short notes on message box.
13. a) Explain the picture box with an example. (OR)
    b) What is the purpose of the progress bar?
14. a) Write a note on Cobject. (OR)
    b) Write the procedure for creating Icons in VC++.
15. a) Explain Cthread. (OR)
    b) Discuss Cmutex with an example.

SECTION C (5 * 8 = 40)

16. a) Write a window program for displaying a text in a window on selecting the menu item 'OPEN'. (OR)
    b) Explain the procedure for using any two Dialog Box controls in windows program.
17. a) Explain about any five numeric functions in VB with examples for each. (OR)
    h) Explain with an example, how user defined functions are handled in VB.
18. a) Write a VB program to display a list in a list box and to display the item selected from it on a textbox. (OR)
    b) Discuss briefly about Active-X controls.
19. a) Explain the following:
    (i) Cexcept (ii) Cedit (OR)
    b) Explain with an example, how menu is handled in VC++.
20. a) Describe in detail, the various data access methods in VC++. (OR)
    b) Explain the following:
    (i) Csemaphore.
    (ii) Cevent.

IV – SEMESTER

JAVA PROGRAMMING

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is the use of Java class libraries.
2. Write any two relational operators in JAVA.
3. What is meant by Data abstraction?
4. Define Method overloading.
5. What is charAt()?
6. What are adapter classes?
7. What are thread priorities?
8. Write the stream classes in Files.
9. What is RMI?
10. Define the client.

SECTION B (5 * 5 = 25)

11. a) Write down the Arithmetic operators with the users. (OR)
    b) Write short notes on switch statement with example.
12. a) Discuss about scope rules. (OR)
    b) Write short notes on Information hiding.
13. a) Explain about hashcode. (OR)
    b) Write short notes on Jslider.
14. a) What are the basics of JAVA exception handling? (OR)
    b) Write short notes on Thread synchronization.
15. a) Discuss about HTTP requests. (OR)
    b) Write short notes on servers?

SECTION C (5 * 8 = 40)

16. a) Discuss in detail about the History of JAVA. (OR)
    b) Write briefly about the various control structures in JAVA.
17. a) Explain in detail about Method overloading. (OR)
    i) Write brief notes on superclass and subclass.
18. a) Discuss on string buffer class. (OR)
    b) Write brief notes on Jbutton.
19. a) Discuss on thread scheduling. (OR)
    b) Explain how to create the sequential file.
20. a) Discuss on post requests. (OR)
    b) Explain about the Bean Info class.

IV – SEMESTER

MANAGEMENT CONCEPTS AND COMMUNICATION

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Define organization.
2. What do you mean by scalar chain?
3. Define Externally imposed policy.
4. Define MBO.
5. What is meant by departmentation.
6. Distinguish between Selection and Recruitment.
7. Define motivation.
8. Write a note on leadership behaviour.
9. Define grapevine.
10. What is Gesture?

SECTION B (5 * 5 = 25)

11. a) Explain the concept of Management. (OR)
b) State any two activities of an organization in view of Henri Fayol.
12. a) What are the functions of leader in setting and achieving of organizational goals.(OR)
b) Write short notes on critical contact theory of recruitment.
13. a) Bring out the importance of communication in industry. (OR)
b) What is meant by Semantic Barrier.
14. a) List down the advantages and disadvantages of body language. (OR)
b) Define drafting and give two ways of effective drafting.
15. a) What do you mean by the term ‘cut-score’ in selection tests. (OR)
b) Discuss the errors in interview. Explain any one.

SECTION C (5 * 8 = 40)

16. a) Explain the functions and features of Management. (OR)
b) What are the steps involved in MBO? Discuss about their advantages and disadvantages in brief.
17. a) Discuss the various qualities of leader and skills of leader. (OR)
j) Explain the process of theories of Motivation.
18. a) Explain the training methods with its advantages. (OR)
b) What are the techniques involved in selection.
19. a) Discuss the various types of communication with small examples. (OR)
b) What are the barriers to communication.
20. a) Discuss the various procedures for conducting meeting. (OR)
b) Draft a letter to your supplier requesting him to extend the time for the settlement of the account.

I – SEMESTER

CLIENT SERVER TECHNOLOGY (Elective – I)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is Server?
2. What do you mean by 2 – Tier Architecture?
3. Define Right sizing.
4. What is MOM?
5. What is Base Services?
6. Define Data Mining.
7. Differentiate Server Architecture and Multithread Architecture.
8. What is IPC?
9. Define Intranet.
10. What is CORBA?

SECTION B (5 * 5 = 25)

11. a) Explain 3 – Tier Architecture. (OR)
    b) Write short notes on Gartner Classifications.
12. a) Discuss on Database Connectivity. (OR)
    b) Write short notes on Server Scalability.
13. a) Discuss on Transaction Process Monitors. (OR)
    b) Explain SQL Database Servers.
14. a) Discuss on Data Warehousing. (OR)
    b) Write short notes on RPC.
15. a) Discuss on Intranet. (OR)
    b) Write short notes on CORBA.

SECTION C (5 * 8 = 40)

16. a) Explain briefly about Client/Server Model. (OR)
    a. Write short notes on:
       (i) Up sizing (ii) Middleware.
17. a) Explain the Types of Server and Clients briefly. (OR)
    k) Explain in detail about Operating System Services.
18. a) Explain in detail about Client/Server Software. (OR)
    b) Write short notes on : i) Stored Procedures ii) Hybrid Architecture.
19. a) Write short notes on :
       (i) Transaction Model
       (ii) Server Architecture. (OR)
    b) Explain briefly about Client/Server Protocols.how to create the sequential file.
20. a) Discuss about Extranet in Client/Server Computing. (OR)
    b) Explain briefly about Intranet in Client/Server Computing.

IV– SEMESTER

DIGITAL IMAGE PROCESSING (Elective – I)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is Digital Image Processing?
2. What is Gray-level Resolution?
3. What is histogram matching?
4. What are convolution masks?
5. What is white noise?
6. What is rubber-sheet transformation?
7. What is data compression?
8. What is Bit-Plane coding?
9. What is Segmentation?
10. What is the use of Motion in Segmentation?

SECTION B (5 * 5 = 25)

11. a) Explain the fundamental steps in Digital Image Processing. (OR)
    b) Explain the basic concepts in Sampling and Quantization.
12. a) Explain few Basic Gray Level Transformations. (OR)
    b) Explain basics of Spatial Filtering.
13. a) Discuss Spatial and Frequency Properties of Noise. (OR)
    b) Explain Inverse Filtering.
14. a) Explain Image Compression Models. (OR)
    b) Explain Wavelet Coding.
15. a) Discuss on Edge Detection (OR)
    b) Explain segmentation by Morphological Watersheds.

SECTION C (5 * 8 = 40)

16. a) Explain the Components of an Image Processing System. (OR)
    b) Explain Image Sensing and Acquisition.
17. a) Explain Histogram Processing. (OR)
    l) Explain Smoothing and Sharpening Spatial Filters.
18. a) Explain in detail about Adaptive Filters. (OR)
    b) Explain about Geometric transformations.
19. a) Explain Error-Free Compression. (OR)
    b) Explain briefly about Lossy Compression.
20. a) Discuss about Thresholding. (OR)
    b) Explain briefly about Region-Based Segmentation.

IV – SEMESTER

NEURAL NETWORKS (Elective – I)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1.What is learning?
2.Define feed forward neural networks.
3.What is local minima?
4.Mention the use of Hope Field network?
5. What is Fuzzification?
6. Mention the meaning of fuzzy relation?
7. Give an example for fuzzy variable?
8. What is defuzzification?
9. What is speech recognition?
10. Mention any one applications of neural networks pattern recognition?

SECTION B (5 * 5 = 25)

11. a) Explain any two activation functions used in neural networks. (OR)
b) Prove that the two input logical OR function is linearly separable.
12. a) Distinguish instar and outstar networks. (OR)
b) What is BAM ? Explain
13. a) Explain Fuzzy composition with an example (OR)
b) Explain any one method of representation fuzzy relation.
14. a) Discuss the need for fuzzification (OR)
b) Explain linguistic variable with an Example.
15. a) What is fuzzy logic ? Explain. (OR)
b) Explain the difference between conventional querying and fuzzy querying.

SECTION C (5 * 8 = 40)

16. a) Explain perception training algorithm with an example its limitations. (OR)
b) Explain the method of adjusting the weights in the output layer of the back Propagation neural network
17. a) Explain the architecture and operation of ART . (OR)
b) Prove that the Hopfield network is stable using its energy function
18. a) Explain the three fuzzy operations. (OR)
b) Discuss any three membership functions.
19. a) Explain the defuzzification method used fuzzy systems (OR)
b) Write short notes on: (i) Transition Matrix (ii) Measure Of fuzziness
20. a) Explain the use of neural networks for character recognition. (OR)
b) Discuss the design of a fuzzy controller.

IV – SEMESTER

MULTIMEDIA AND ITS APPLICATIONS (Elective – II)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Expansion of MIDI is
   (a) Musical instrumental Digital Interface
   (b) Musical Instrumental Data interface
   (c) Musical Interface Digital Instrument
   (d) Musical Interface Data Instrument
2. Macintosh had good build in
   (a) video (b) Audio (c) Picture (d) All the Above
3. Type face is a family of graphic characters which includes many types of
   (a) sizes (b) Styles (c) a & b d) None of these
4. The wider- than – tall orientation is called
   (a) Portrait (b) Landscape (c) Letter (d) A4
5. Sound waves vary in ---------- and ----------
   (a) amplitude and hertz (b) Vibrations and pressures
   (c) amplitude and Frequency (d) Vibrations and frequency
6. Expand MPEG
   (a) Motion Picture Experts Group
   (b) Moving Pixel Experts Group
   (c) Moving picture Experts Group
   (d) Motion Pixel Experts Group
7. The series of frames in between the key frames are drawn in a process called
   (a) Aliasing (b) Tweening (c) Sketching (d) None of these
8. The process of building a single frame from two fields is called----------
   (a) Interlacing (b) Interloop (c) Mixing (d) Merging
9. CD-ROM contain up to
   (a) 72 minutes (b) 78 Minutes (c) 80 minutes (d) 82 Minutes
10. HDTV means ----------

SECTION B (5 * 5 = 25)

11. a) What is meant by multimedia?. (OR)
    b) Explain any three basic multimedia tools
12. a) Discuss about Audio speaker (OR)
    b) Write notes on digital scanners
13. a) Describe about image scanners? (OR)
    b) Write short notes on full motion video?
14. a) Discuss about JPEG? . (OR)
    b) Explain about multimedia in internet
15. a) Write note on desktop computing (OR)
    b) Explain the knowledge based multimedia systems

SECTION C (5 * 8 = 40)

16. a) State any five types of Multimedia file formats (OR)
    b) Discuss about any one multimedia application in detail with features

17. a) Describe the multimedia authoring tools (OR)
    b) Write a detailed note on sound card
18. a) Compare analog video and digital video (OR)
    b) Explain the objective of MPEG motion video compression standard
19. a) Describe the various operating system support available for multimedia with Examples (OR)
    b) Write detailed notes on world wide web.
20. a) Explain how multimedia can be effectively used in training and education (OR)
    b) Write about the multimedia applications which are effectively used in real world

IV – SEMESTER

DISTRIBUTED COMPUTING (Elective – II)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is Distributed System?
2. Give any one of the advantages of distributed systems compared to the traditional time-sharing system.
3. How suitable is star topology for a distributed environment?
4. What is meant by global knowledge?
5. Give an example for end-to-end protocols.
6. What are distributed resources?
7. What is the function of a printer server?
8. What is transparency ?
9. What is an e-mail server?
10. What is distributed database?

SECTION B (5 * 5 = 25)

11. a) What are the objectives of distribution? (OR)
    b) Outline the applications of distributed processing.
12. a) Discuss the basic issues in distributed databases. (OR)
    b) Discuss the clock synchronization algorithms.
13. a) Explain the implementation issues for Processor Allocation algorithms. (OR)
    b) Discuss termination of distributed algorithms.
14. a) Explain in detail about dimension analysis . (OR)
    b) Explain in detail about printer server.
15. a) List the features of distributed database system compared to centralized database system. (OR)
    b) Explain the different levels of distribution transparency with respect to complex applications.

SECTION C (5 * 8 = 40)

16. a) Enlist and explain the motivations behind the development of distributed systems. (OR)
    b) Explain the various interconnection topologies with a neat sketch.
17. a) Explain distributed control and inter process communication. (OR)

b) Distinguish among fully redundant, partially redundant and partitioned distributed databases.

18. a) Describe about network database design considerations. (OR)
    b) Explain about synchronization of network databases.
19. a) Explain E-mail server. (OR)
    b) "Distributed systems are intrinsically less secure than centralized systems" – Discuss.
20. a) Explain in detail the name resolution mechanism. (OR)
    b) Explain the various forms of transparencies.

M.C.A DEGREE EXAMINATION

IV – SEMESTER

SIMULATION AND MODELLING (Elective – II)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Define : Model.
2. What is an event?
3. Define : Independence in random numbers.
4 .List any two discrete distribution.
5. State : Force flowed law.
6. Define : Network
7. Define : Multipaging.
8. Define : Scheduling of multiprocessors.
9. Define : Validation
10. What is meant by parametrization?

SECTION B (5 * 5 = 25)

11. a) Illustrate the term 'Activity' with an example. (OR)
    b) Give an example for dynamic physical model.
12. a) List the various continuous distributions. (OR)
    b) What is meant by decision model.
13. a) Briefly explain modeling cycle. (OR)
    b) State the techniques for evaluating network models. Explain any one of them briefly.
14. a) Explain : Hierarchical modeling . (OR)
    b) Explain : FCFS scheduling.
15. a) Explain subsystem validity. (OR)
    c) Explain centre description.

SECTION C (5 * 8 = 40)

16. a) Discuss the advantages and disadvantages of simulation. (OR)
    b) Explain activity diagram with suitable example.
17. a) Generate a sequence of three random integers using linear congruential method. Assume m=100; a= 19; c=0 and X_0 =63 (OR)
    b) Explain Weibull distribution with an example.

18. a) Explain workload characterization. (OR)
    b) Arrivals to a self-service gasoline pump occur in a Poisson fashion at a rate of 12 per hour. Service time has a distribution which averages 4 minutes with a standard deviation of 1.33 minutes. What is the expected number of vehicles in the system?
19. a) Explain the channel contention in RPS I/O Systems. (OR)
    b) Explain the systems with known average multiprogramming level.
20. a) Explain various service demands with suitable example. (OR)
    b) Explain the procedure of validating model.

V – SEMESTER - SOFTWARE ENGINEERING

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Define Software Engineering
2. What is meant by project estimation?
3. What is meant by project estimation?
4. Define Behavioral Modeling?
5. What is meant by data design?
6. What do you mean by transaction mapping?
7. What is Task analysis?
8. What is an object?
9. Define Software testing?
10. What is meant by System Testing?

SECTION B (5 * 5 = 25)

11. a) Write short note on software crisis (OR)
    b) Write in detail about Software steps
12. a) Explain about analysis principles. (OR)
    b) Discuss in detail about software prototyping.
13. a) Write the design principles. (OR)
    b) Explain about transform mapping.
14. a) Explain in detail about structured programming (OR)
    b) Discuss about object design process.
15. a) Write in detail about white box testing. (OR)
    b) Write short note on unit testing

SECTION C (5 * 8 = 40)

16. a) Discuss in detail about software process model. (OR)
    b) Describe in detail about project planning.
17. a) Describe in detail about data modeling . (OR)
    b) Write brief notes on functional modeling.
18. a) Write in detail about the design concepts. (OR)
    b) Explain in detail about architectural design.
19. a) Explain in detail about Task modeling. (OR)
    b) Write brief notes on object –oriented design.
20. a) Write in detail about Basis Path Testing.. (OR)
    b) Explain in detail about integration testing.

V – SEMESTER

SOFTWARE TESTING

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Define Business Risk.
2. Define software testing.
3. What are testing tools?
4. Whys is software testing essential? Give two reasons?
5. What is Black Box testing?
6. What is Desk Debugging?
7. Define Acceptance Testing?
8. What is test documentation?
9. Define verification.
10. Define metrics.

SECTION B (5 * 5 = 25)

11.a) What is a software system? Discuss in brief. (OR)
b) How do you test a software?

12. a) What are program peer view test tools? (OR)
b) What are evaluation test results?

13. a) How do you inspect a test case? (OR)
b) What is mean by correctness of the software? How do you test the correctness?

14. a) Explain any one testing technique (OR)
b) List the features of client/server applications.

15. a) How do you improve the test process? (OR)
b) Briefly explain test documentation.

SECTION C (5 * 8 = 40)

16. a) Explain testing of a software using life cycle methodology. (OR)
b) Explain the development of software system testing tactics.

17. a) Explain design phase testing. (OR)
b) Explain acceptance testing.

18. a) Explain the testing methodology for software maintenance. (OR)
b) How do you test the validity of a software cost estimate? Discuss.

19. a) Explain the testing strategy for a rapid prototyping approach. (OR)
b) Describe in detail the testing tools and the importance.

20. a) How do you evaluate the test effectiveness? Discuss (OR)
b) Give a detail note on final test reporting.

V – SEMESTER

DATA MINING AND WAREHOUSING

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Define KDD.
2. What is meant by a Decision tree?
3. What is classification rule mining?
4. What is meant by an outlier?
5. Define frequent item set.
6. Define a Data Warehouse.
7..OLAP is ----------.
8. Data mart is ----------.
9. Define Metadata.
10. Mention any two Data Warehousing tools.

SECTION B (5 * 5 = 25)

11. a) Differentiate Data Mining and Knowledge Discovery in databases. (OR)
    b) Write a short note on genetic Algorithm.
12. a) What are statistical based classification rule mining algorithms? (OR)
    b) What are the rule based algorithms?
13. a) What is meant by clustering? (OR)
    b) What are incremental rules?
14. a) What are the characteristics of a Data Warehouse? (OR)
    b) Write short notes on snow flake schema.
15. a) Mention the organization issues in building a data warehouse. (OR)
    a. Write short notes on National Data Warehouses.

SECTION C (5 * 8 = 40)

16. a) Mention the social implications of data mining in detail. (OR)
    b) Write a note on Neural Networks as a Data Mining technique.
17. a) Explain the Decision tree – based algorithms. (OR)
    m) Discuss the combining techniques used in classification rule mining.
18. a) Explain in detail the partitional algorithms used in clustering. (OR)
    b) Describe in detail the advanced association rules techniques.
19. a) Discuss the significant aspects of OLAP systems. (OR)
    b) Explain Multifact star schema in detail.
20. a) Explain some of the applications of Data Warehousing and Data Mining in Government. (OR)
    b) Explain the Design considerations in building a data warehouse.

V – SEMESTER

SOFTWARE PROJECT MANAGEMENT (Elective – III)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is life cycle model of the project?
2. Expand the term SMART.
3. Define configuration management.
4. What is risk mitigation?
5. Name the four Dimensions of requirement gathering.
6. Give any two advantages of function point method for software size estimation.
7. Write the primary disadvantage of white box testing.
8. Define regression test.
9. Give the expansion of B2C and B2B.
10. What is called as problem repository?

SECTION B (5 * 5 = 25)

11. a) Explain the Waterfall model. (OR)
    b) Outline the steps that constitute a metrics strategy.
12. a) How are the change control process sub-divided ?Explain (OR)
    b) Why is quality important in software development?
13. a) List the challenges during the requirements management phase.
    b) Explain the common challenges during estimation.
14. a) What are the design techniques that one can follow to enhance diagno stability . (OR)
    b) Why and how is system testing done?
15. a) Explain the activities in problem reporting during the maintenance phase. (OR)
    b) Discuss the management issues during the maintenance phase.

SECTION C (5 * 8 = 40)

16. a) Briefly describe the phase in the product development life cycle. (OR)
    b) Discuss the people and organizational issues quality assurance.
17. a) Describe the main functions of software quality assurance. (OR)
    b) Explain the common tools and techniques used for identifying the potential risks.
18. a) Discuss the skill sets required during the requirements phase. (OR)
    b) What are the three phases of estimation? Explain.
19. a) Explain the principles that can be followed for designing for portability and testability .

    (OR)

    e) What are the activities that make up testing? Explain any two in detail.
20. a) Give an comparison of various models available for the execution of global projects

    (OR)

    b) Discuss the effect of internet on project management.

V – SEMESTER

EMBEDDED SYSTEMS (Elective – III)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is an embedded system?
2. What is a microcontroller.
3. What is HDLC?
4. Give two examples of useful Linux Device Drivers.
5. Define Finite State Machine.
6. What is Software complexity?
7. Define Thread.
8. Give any two points essential for Fifteen-Point Strategy for synchronization between processes.
9. Define POST.
10. What is the purpose of Smart Card?

SECTION B (5 * 5 = 25)

11. a) Explain the Classification of Embedded system. (OR)
    b) Explain Exemplary Applications of each type of Embedded systems
12. a) Explain Parallel Port Devices. (OR)
    b) Explain Device Drivers.
13. a) Explain the issues in Multiprocessor systems. (OR)
    b) Explain Software Analysis.
14. a) Discuss about the use of Semaphores for critical section. (OR)
    b) Explain when is an RTOS necessary and when is it not necessary in the Embedded System.
15. a) Explain Embedded System Project Management's Four Components. (OR)
    b. Explain the use of Software Tools for Development of an Embedded system.

SECTION C (5 * 8 = 40)

16. a) Explain Digital Signal Processor. (OR)
    b) Explain Embedded System-On-Chip (SOC) and in VLSI circuit.
17. a) Explain Synchronous, Iso-synchronous and Asynchronous communications for Serial Devices. (OR)
    n) Explain Device Servicing without using an ISR.
18. a) Explain Petri Net Model. (OR)
    b) Explain Software Development Process Life cycle and its models.
19. a) Explain Inter Process Communication. (OR)
    b) Explain Linux Kernel for the Device Drivers and Embedded System.
20. a) Explain the issues in Embedded System Design. (OR)
    b) Explain in brief the case study of an Embedded system for an Adaptive Cruise Control System in a Car.

V – SEMESTER

BIO INFORMATICS (Elective – III)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is bioinformatics.
2. Define profile.
3. What are splice variants?
4. What is the purpose of cDNA libraries?
5. Define probe.
6. What is dynamic programming?
7. What are phenotypes and genotypes?
8. What is the use of PSI-BLAST.
9. What is 2D Electrophoresis.
10. What is the purpose of NMR structures?

SECTION B (5 * 5 = 25)

11. a) Discuss the Genome projects. (OR)
    b) Why is bioinformatics important?
12. a) Explain DNA sequence databases. (OR)
    b) Explain Specialised genomic resources.
13. a) Explain database searching . (OR)
    b) Explain the Dotplot.
14. a) Explain the goal of multiple sequence alignment . (OR)
    b) Define Multiple sequence alignment.
15. a) Explain Amino Acids. (OR)
    c. Explain Reverse Protein Folding.

SECTION C (5 * 8 = 40)

16. a) Explain Biological databases. (OR)
    b) Explain Structure classification databases.
17. a) Explain the issues in the interpretation of EST searches. (OR)
    o) Explain the effects of EST data on DNA databases.
18. a) Explain Global alignment with algorithm. (OR)
    b) Explain Pairwise database searching.
19. a) Explain searching databases with multiple alignments. (OR)
    b) Explain the Distance-based Methods of Phylogenetics.
20. a) Explain Predicting RNA Secondary structures. (OR)
    b) Explain Protein Classification.

V – SEMESTER

WAP & XML (Elective – IV)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. Differentiate Server and Client.
2. State the need for a standard.
3. What is a Markup language?
4. Expand URL.
5. State the various controls that can be included in WML document.
6. State any two miscellaneous markup.
7. Differentiate computer terminal and mobile terminal.
8. State one important feature of a good user interface.
9. WTA stands for ----------.
10. Name any two tools used for application creation.

SECTION B (5 * 5 = 25)

11. a) Write a note on the origin of WAP. (OR)
    b) Relate WAP with other standards.
12. a) Describe briefly Markup Basics. (OR)
    b) What are events? Explain.
13. a) Write a short note on Meta Element. (OR)
    b) Explain briefly Document type declarations.
14. a) State a few guidelines for User Interface Design. (OR)
    b) Explain briefly structured usability methods.
15. a) Write a note on future WAT enhancements. (OR)
    d. Discuss WTA Client framework briefly.

SECTION C (5 * 8 = 40)

16. a) Describe WAP architecture in detail. (OR)
    b) Write an essay on the rise of mobile data.
17. a) Discuss in detail WML document model. (OR)
    p) What do you mean by authoring? Explain WML authoring.
18. a) Discuss in detail the various issues associated with Application Security. (OR)
    b) Describe in detail Errors and Browser limitations.
19. a) State and explain the design guidelines for selecting WML elements. (OR)
    b) Explain the various issues associated with Website Design.

20. a) Write an essay on the future of Mobile Internet. (OR)
    b) Describe in detail WTA Server and Security.

V – SEMESTER

E-COMMERCE (Elective – IV)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is E-commerce?
2. What is Information Superhighway?
3. State the different types of Electronic Commerce applications
4. State any two desirable characteristics of an Electronic Marketplace.
5. What are the three types of Electronic tokens?
6. State any two tangible benefits of EDI.
7. What is Logistics?
8. What is meant by Data Warehouse?
9. State any two guidelines for Internet Advertising.
10. What is information Filtering?

SECTION B (5 * 5 = 25)

11. a) Discuss about few E-commerce Applications. (OR)
    b) Explain Components of the I-way.
12. a) Compare Hypertext versus Hypermedia in web background. (OR)
    b) Explain Mercantile Process Models.
13. a) Explain Relationship-Based Smart Cards. (OR)
    b) Explain EDI Applications in business.
14. a) Explain Work-Flow Management. (OR)
    b) Explain how Corporate Digital Library acts as core of Document Management.
15. a) Explain Charting the On-line Marketing process. (OR)
    e. Explain in brief about Information Search and Retrieval.

SECTION C (5 * 8 = 40)

16. a) Explain Electronic Commerce Framework. (OR)
    b) Explain Network Access Equipment.
17. a) Explain the technology behind the web. (OR)
    q) Explain few Consumer-Oriented Applications in detail.
18. a) Explain the types of Electronic Payment Systems. (OR)
    b) Explain EDI Layered Architecture.
19. a) Explain the Supply Chain Management (SCM). (OR)
    b) Explain the types of Digital Documents.
20. a) Discuss about Advertising on the Internet. (OR)
    b) Explain in detail about Electronic Commerce Catalogs or Directories.

V – SEMESTER

ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS (Elective – IV)

Duration : 3 Hrs Answer all questions Marks : 75

SECTION A (10 * 1 = 10)

1. What is Artificial Intelligence?
2. State any two AI techniques.
3. What is Constraint Satisfaction?
4. What is the Frame Problem?
5. What is the difference between Forward Reasoning and Backward Reasoning.
6. What is Logic programming?
7. State any two factors that makes Understanding Hard.
8. What is meant by heuristic knowledge?
9. What is an Ontology?
10. State any two major design issues in Speech Recognition systems.

SECTION B (5 * 5 = 25)

11. a) Discuss the Tic-Tac-Toe Problem with suitable data structure and algorithm. (OR)
    b) Define the Problem as a State Space Search and discuss about it.
12. a) Explain in brief about Hill Climbing. (OR)
    b) Explain the Approaches to Knowledge Representation.
13. a) Explain representing Simple facts in logic using an example. (OR)
    b) Compare Procedural Versus Declarative Knowledge.
14. a) Explain the Fuzzy Logic . (OR)
    b) Explain the Syntactic-Semantic Spectrum of Knowledge Representation.
15. a) Explain Case-based reasoning. (OR)
    b) Explain about Perception.

SECTION C (5 * 8 = 40)

16. a) Explain the Water Jug Problem with production rules. (OR)
    b) Explain Breadth-First Search.
17. a) Explain the A* Algorithm. (OR)
    r) Explain the issues in Knowledge Representation.
18. a) Explain the Unification Algorithm. (OR)
    b) Explain Forward-Chaining and Backward-Chaining Rule Systems.
19. a) Explain the Baye's Theorem in Probability. (OR)
    b) Explain the Components of a Planning System.
20. a) What is Learning? Explain it in detail. (OR)
    b) Explain Knowledge Acquisition in an Expert system.