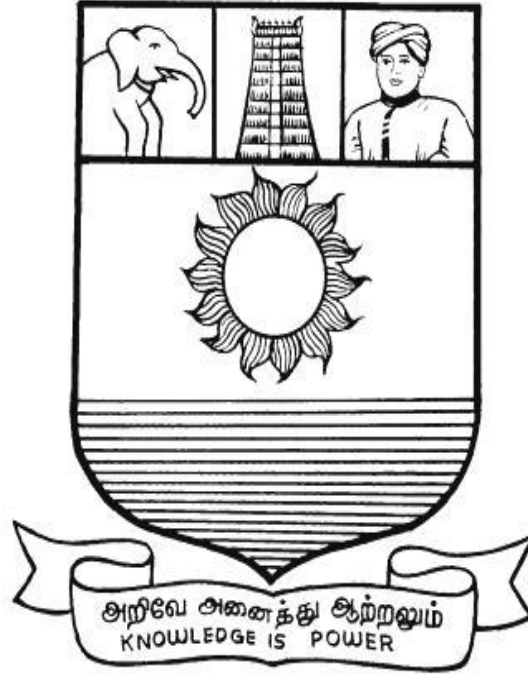


**MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI – 12.**



BOARD OF STUDIES PG (IT)

(With effect from the academic year 2017-2018 onwards)

Manonmaniam Sundaranar University,

Tirunelveli – 12.

M.SC. NETWORK & INFORMATION TECHNOLOGY

(CBCS - For Colleges)

(2 years – 4 Semesters)

REGULATIONS

(Effective from the academic year 2017-2018 onwards)

1. Eligibility for Admission:

Candidates for admission to the first year of two year M.Sc. Networking and Information Technology shall be required to have passed any degree from a recognized University accepted by the Syndicate of this University.

2. Duration of the Course:

The course shall be extended for a period of two academic years consisting of four semesters with two semesters per year.

3. Passing Requirement:

The candidate will be declared to have passed in any subject (including practical and project viva voce) of study if he/she secures not less than 50 marks in the University end semesters examinations of their subjects.

4. Classification of successful candidates:

A candidate who qualifies for the degree with 60% or more shall be declared to have passed the examination in FIRST CLASS.

A candidate who qualifies for the degree with the 75% or more shall be declared to have passed the examination in FIRST CLASS with DISTINCTION.

All other successful candidates shall be declared to have passed in SECOND CLASS

5. Procedure in the Event of Failure :

If a candidate fails in a particular subject (other than project work) he/she may reappear for the University examination in that subject in subsequent semesters and obtain pass mark.

In the event of failure in project work, a candidate shall reregister for project work and redo the project work in the subsequent and resubmit the dissertation a fresh for evaluation.

6. General Conditions :

- (a) A candidate will be deemed to have completed the course of any semester only if he/she has secured not less 75% of attendance in the total number of working days of the concerned semester as a whole shall be followed. The usual procedures of condonation and repeat semester in vogue shall be followed for others.

Notes:

1. Each paper carries an internal component.
2. There is a pass minimum of 50% for external and overall components.
3. Theory Paper
Assessment Components (External:Internal =75:25)
4. Practical Paper
Assessment Components (External:Internal =50:50)
5. Internal Assessment
For theory course

Average of the best two test marks from three compulsory Test : 15 Marks.

Assignment	: 5 marks
Seminar	: 5 marks
Total	: 25 marks

For practical course

Experimental Work	: 20 marks
Record	: 15 Marks
Model Test	: 15 Marks
Total	: 50 Marks

Question Pattern – External Exam(Theory) :

- Part-A : 10 Multiple choice Questions (One mark each) - $10 \times 1 = 10$ Marks
(Note: Two Questions per unit)
- Part-B : 5 Questions (either – or type) – (5 marks each) - $5 \times 5 = 25$ Marks
(Note: One Questions per unit)
- Part-C : 5 Questions (either – or type) – (8 marks each) - $5 \times 8 = 40$ Marks

(Note: One Questions per unit)

- (b) Choice Based Credit System is followed for all the Courses. When a student completes the required credits prescribed for the course, Overall Percentage of Marks (OPM) will be calculated as follows. The marks obtained by the candidate (sum of external and internal marks) in a paper is multiplied by the credits assigned to the paper. Such weighted marks for all the papers are added and divided by the total credit.

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits	Maximum Marks			Passing Minimum	
					Internal	External	Total	External	Total
I	Data Communication and computer Networks	Core-1	5	4	25	75	100	38	50
	Object Oriented Programming using C++	Core-2	5	4	25	75	100	38	50
	Visual Programming	Core-3	4	4	25	75	100	38	50
	Software Engineering	Core-4	4	4	25	75	100	38	50
	E-Commerce	Core-5	4	4	25	75	100	38	50
	C++ Programming Lab	Core Practical-1	4	2	50	50	100	25	50
	Visual programming Lab	Core Practical-2	4	2	50	50	100	25	50
	Sub total	7 courses	30	24					

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits	Maximum Marks			Passing Minimum	
					Internal	External	Total	External	Total
II	Advanced Java Programming	Core-6	5	4	25	75	100	38	50
	RDBMS concepts and Oracle	Core-7	5	4	25	75	100	38	50
	Principles of Information Technology	Core-8	4	4	25	75	100	38	50
	Embedded Systems	Core-9	4	4	25	75	100	38	50
	Elective-1 (select any one from Elective –I group)	Elective-1	4	3	25	75	100	38	50
	Java programming Lab	Core Practical-3	4	2	50	50	100	25	50
	Oracle Lab	Core Practical-4	4	2	50	50	100	25	50
	Sub total	7 courses	30	23					

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits	Maximum Marks			Passing Minimum	
					Internal	External	Total	External	Total
III	Web Designing	Core-10	4	4	25	75	100	38	50
	Operating Systems	Core-11	4	4	25	75	100	38	50
	Network security and Cryptography	Core-12	4	4	25	75	100	38	50
	Software Testing	Core-13	4	4	25	75	100	38	50
	Research Methodology	Core-14	4	4	25	75	100	38	50
	Elective-2 (select any one from Elective – II group)	Elective -2	4	3	25	75	100	38	50
	Web Designing and Network Lab	Core Practical-5	4	2	50	50	100	25	50
	Mini Project	Core Project-1	2+2*	2	50	50	100	25	50
	Subtotal	8 courses	30	27					

Semester	Title of the Subject	Status	Contact Hrs./ Week	Credits	Maximum Marks			Passing Minimum	
					Internal	External	Total	External	Total
IV	Main Project Lab	Core Project-2	30+2*	16	50	50	100	25	50
	Subtotal	1 course	30	16					
Total		14T+5P+2Proj+2Elect.	120	90					

*Extra hours for Project

For the Project, flexible credits are b/w 5 – 8 & Hours per week are b/w 10 - 16.

Total number of credits \geq 90 : 90

Total number of Core Courses : 21 (14 T + 5 P + 2 Prj.)

Total number of Elective Courses : 2

Total hours : 120

List of Electives offered:

Elective – I Group

(A) Management Information System

(B) Big Data analytics

Elective – II Group

(A) Data Warehousing and Mining

(B) Mobile Computing

SEM. I CORE PAPER-1 : DATA COMMUNICATION AND COMPUTER NETWORKS

Unit-I

Introduction : Data Communications – Networks – The Internet – Protocols and Standards.

Network Models : The OSI Model – Layers in the OSI Model. Physical Layer and Media :

Analog and Digital – Periodic Analog Signals – Digital Signals. Digital Transmission : Digital to

Digital Conversion – Analog to Digital Conversion . Transmission Media : Guided Media –

Unguided Media. Using Telephone and Cable Networks for Data Transmission : Telephone

Network – Digital Subscriber Line. (13L)

Unit-II

Data Link Layer : Error Detection and Correction : Introduction – Block Coding – Cyclic Codes

– Noisy Channels – HDLC. Multiple Access : Random Access. Wired LANs : Ethernet –

Standard Ethernet – Fast Ethernet – Gigabit Ethernet. (12L)

Unit-III

SONET/SDH : Architecture – Sonet Layers Virtual-Circuit Networks : Frame Relay and ATM –
. Network Layer : IPv4 Address – IPv6 Address. **(13L)**

Unit-IV

Network Layer : Internet Protocol – Internetworking – IPv4 – IPv6. Network Layer :Address
Mapping , Error Reporting and Multicasting – ICMP – IGMP. Network Layer : Delivery
,Forwarding, and Routing – Unicast Routing Protocols – Multicast Routing Protocols. **(10L)**

Unit-V

Process-to-Process Delivery: UDP, TCP – Process-to-Process Delivery – User Datagram
Protocol(UDP) – TCP. Congestion Control and Quality of Service – Data Traffic – Congestion
– Congestion Control – Quality of Service – Techniques to Improve. Application Layer : Name
space – Domain Name System – Distribution of Name Space. **(12L)**

REFERENCE BOOKS :

1. Data Communication and Networking – Behrouz A Forouzan – McGraw Hill – 4th Edition - 2006
2. Data and Computer Communications – William Stallings – Pearson – 2013
3. Computer Networks – Bhushan Trivedi – Oxford University Press - 2011

SEM. I CORE PAPER-2 : OBJECT ORIENTED PROGRAMMING USING C++

Unit-I

Principles of Object Oriented Programming : Basic Concepts of Object Oriented Programming-
Benefits of OOP –Applications of OOP – Tokens, Expressions and Control Structures : Tokens-
Keywords- Identifiers and constants-Basic data types- User Defined Data Types – Derived Data
types – Symbolic Constants –Type Compatibility – Declaration of Variables –Operators in C++
- Expressions and their types – Control Structures. **(12L)**

Unit- II

Classes and Objects Specifying a class –Defining Member functions – Memory allocation for
objects – Static Member functions –Arrays of Objects –Objects as Function Arguments –
Friendly functions –Returning Objects – Pointers to Members . Constructors and Destructors –
Parameterized Constructors –Multiple Constructors – Constructors with Default Arguments –
Copy Constructor – Destructors. **(12L)**

Unit-III

Operator Overloading and Type conversions : Defining Operator Overloading – Overloading
Unary Operators –Overloading binary Operators – Overloading binary operators using friends –

Manipulation of Strings using operators – Rules for overloading operators – Type Conversions. Inheritance : Defining derived classes – single inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Virtual base classes – Abstract Classes –Constructors in Derived classes – Nesting of classes. **(10L)**

Unit- IV

Pointers, Virtual Functions and Polymorphism - Pointers – Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual functions – Pure virtual functions Managing Console I/O Operations : C++ streams – C++ Stream Classes – Unformatted I/O Operations – Formatted Console I/O Operations – Managing Output with Manipulators . **(13L)**

Unit-V

Working with Files – Opening and closing a File – Updating a file – Command-line arguments – Templates – Class templates – Class templates with Multiple Parameters – Function Templates - Function Templates with multiple parameters- Overloading of Template functions –Member function Template-Exception handling Mechanisms. **(13L)**

REFERENCE BOOKS :

- 1.Object Oriented Programming with C++ - E. Balagurusamy ,Tata Mcgraw Hill Publications – 2006
2. Object Oriented Programming with ANSI and Turbo C++ -Ashok N.Kamthane, Pearson Education Asia Publications.

SEM. I CORE PAPER-3 : VISUAL PROGRAMMING

UNIT-I

Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers. **(10L)**

UNIT-II

Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures. **(12L)**

UNIT-III

Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - DoEvents and Sub Main - Error Trapping. **(12L)**

UNIT-IV

VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics (13L)

UNIT-V

Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop – Accessing windows API – Visual basic and Databases – Visual basic and the Internet. (13L)

REFERENCE BOOKS :

1. Gary Cornell, 1999, Visual Basic 6 from the Ground up, Tata McGraw-Hill, New Delhi .
2. Noel Jerke, 1999, Visual Basic 6 (The Complete Reference), Tata McGraw-Hill, New Delhi.

SEM. I CORE PAPER-4 : SOFTWARE ENGINEERING

Unit-I

Introductions: Evolving role of software – Software characteristics, components and its applications – Generic view of software engineering – Software process models. (12L)

Unit-II

Systems Analysis: Requirements analysis – Analysis principles – Prototyping Software requirement specification – Data modeling, functional modeling and behavioral modeling. (12L)

Unit-III

Design concepts: Design and software quality, Design concepts : Abstraction, refinement, modularity, and software architecture control hierarchy structural partitioning and information hiding, Effective modular design: functional independence, cohesion and coupling – design documentation. (12L)

Unit-IV

Design Methods: Data design – Architectural design process: transform mapping and transaction mapping – interface design – procedural design. Design for Real – Time Systems : System considerations – real time systems – analysis and simulation of real time systems. (12L)

Unit-V

Software Testing Methods : Software testing fundamentals. White box testing: basis path testing and control structure testing – black box testing – testing for specialized environments. Software Testing Strategies: A strategic approach to software testing – unit testing – integration testing – validation testing – system testing. (12L)

REFERENCE BOOKS

1. R.S.Pressman "Software Engineering", (5th edition) Tata McGraw Hill, 1997.
2. Software Engineering Principles And Practices, Second Edition, Rohit Khurana ITL ESL
3. Software Engineering Principles And Practice, Waman S Jawadekar, Tata McGraw-Hill

SEM. I CORE PAPER-5 : E-COMMERCE

Unit-I

Overview of electronic commerce: introduction-definition of electronic commerce-potential benefits of electronic commerce-internet and www as enablers of electronic commerce-impact of electronic commerce on business models-electronic commerce security-organization of topics-implications for the accounting. Electronic commerce and the role of independent third parties: introduction-consulting practices and accountants-independence-cpa vision problem- new assurance services identified by the aicpa-impact of Electronic commerce on the traditional assurance function-third party Assurance of web based electronic commerce-implications for the accounting. Regulatory environment: introduction-cryptography issues-privacy issues-web linking-domain name disputes-internet sales tax-electronic agreement and digital signature – Internet service providers and international libel laws-implications for the accounting. (12L)

Unit-II

Edi electronic commerce and the internet: introduction-traditional Edi system-data transfer and standards-financial Edi-Edi systems and the internet-impact of Edi internet applications on the accounting profession. Risks of insecure system: introduction-overview of risks associated with internet transactions-internet associated risk- intranet associated risk-social engineering-risks associated with business transactions- risks associated with confidentially maintained archival-Master file and reference data- risks associated with virus and malicious-implications of the accounting. Risks management: introduction- control weakness vs control risks – Risk management paradigm – disaster recovery plans- Implications of the accounting. (13L)

Unit-III

Internet security standards:-introductions- standard setting issues and Committees - security committees and organization - security protocols and languages-messaging protocols –secure electronic payments and protocols-the role of accountants in internet related standard setting process. Cryptography and authentication: introduction-message security issues- Encryption techniques-key management-additional authentication methods-additional non repudiation techniques. (11L)

Unit-IV

Firewalls: introduction – firewall defined – TCP/IP-open system interconnect (OSI)-components of firewall-typical functionality of firewalls- network topology-securing the firewall-factors to consider in firewall design – in-house solutions Vs commercial fire wall software-limitations of security prevention provided by firewall. Introduction-the *set* protocol – magnetic strip cards-smart cards-electronic check-electronic cash. (12L)

Unit-V

Intelligent agent: introduction-definition of intelligent agent-capabilities of intelligent agent-level of agent sophistication-agent societies- intelligent agents and electronic commerce-online information Chain - limitations of agents- implications of the accounting. Web based marketing: introduction-the scope of marketing-business marketing and information technology-strategy congruence-the four P's applied to internet marketing – the fifth “P” personalization- internet marketing techniques-online advertisement mechanisms –web site design issues- Intelligent agent and their impacts on marketing techniques. (12L)

REFERENCE BOOKS

1. M. Greenstein, T. M. Feinman, 2000, Electronic Commerce, Tata McGraw Hill, New Delhi.
2. Kalakota & Whinston, 2000, Frontiers of Electronic Commerce, 5th Indian Reprint, Pearson Edn., Delhi.

I SEMESTER PRACTICAL LISTS

C++ Programming - Practical Lists

- 1) **Write programs for the demonstration of following in C++**
 1. Classes and Objects
 2. Function Overloading
 3. Constructors and Destructors
 4. Friend function
 5. Inline Function
 6. Operating Overloading
 7. Conversion function
 8. Inheritance
 9. Method Overriding
 10. Virtual Functions
 11. Virtual Base Class
 12. Working with Files
 13. Function Templates and Exception Handling
 14. Class Template
- 2) Write C++ program using classes to find the smallest number in an array of “N” elements using pointers.
- 3) Design classes such that they support the following statements:
 - a. Rupee to dollar conversion
 - b. Dollar to Rupee conversion
- 4) To overload stream operators for reading or displaying contents of vector class's objects as below

```
cin>>v1;cout<<v2;
```
- 5) Define a class to represent a bank account, Data members;

1. Name of the Depositor
2. Account Name
3. Type of Account
4. Balance amount in the account

Member Function

1. Assign initial values
2. To deposit an amount
3. To withdraw an account
4. To display name and balance

Write a main program to test the program.

Visual Programming Lab – Practical Lists

1. Create a Text box Demo using command button Clear Text InsertDate, Show Message
2. Write a program using if... then, if ... else...end if, for..next loop and select case.
3. Display Date and Time using Timer control with Text Box and command Button.
4. Show the Adding, removing Demo using Combo box.
5. Create a new Standard Exe project, Enter the code in the Form Load event procedure. During run time the caption, mouse pointer, window state, Height and width properties should be changed.
6. Display a Demo using Common Dialog Box.
7. Create a Database using Text Box, Combo Box, Check Box, Label Box, Label Box, Frame and Command Button.

Design your form as shown below.

The screenshot shows a Windows form titled "Project1 - Form1 (Form)" with a subtitle "Employee Information". The form has a title bar with standard Windows window controls. The main area is titled "ABC and Company". On the left side, there are labels for "Emp No", "Ename", "Salary", and "Sex". Corresponding to these labels are text boxes labeled "Text1", "Text2", "Text3", and "Text4". The "Sex" label is associated with two radio buttons labeled "Option1" and "Option2". To the right of the text boxes is a section titled "Allowances" containing two radio buttons labeled "Option3" and "Option4", and two labels labeled "Label5" and "Label6". At the bottom right of the form are three buttons: "OK", "Cancel", and "Exit". At the bottom left, there is a label labeled "Label7". The form is set against a dotted grid background.

- Whenever the Textbox “TEXT1” gets the focus it must be cleared.
- The Textbox “TEXT1” should accept only numbers.
- The user must not be allowed to go out of the Text box “TEXT1”when it is empty

- The Text box “TEXT2” must accept only alphabets (uppercase)
- The Text box “TEXT3” should accept only a maximum of 8 digits and only numbers
- “TEXT4” is to input a special allowance to the female candidates. So the user must be allowed to enter values in it only if the candidate is a female candidate
- If any of the allowances is applicable to the candidate it must be displayed in the respective label boxes

HRA -2500.00

DA-3000.00

- When the user clicks the “OK” button a confirmation message must be displayed in the respective label box “Label7”
 - When the user clicks the “Cancel “ button a cancellation message must be displayed in the above mentioned label control and all the textboxes must be cleared .
 - When the user clicks the “Exit “ button stop the execution of the program .
8. Develop a application using Frame ,Check box, Option box.
 9. Design your form with 19 commands & a Text box and perform a Calculator Project ,which can able to work as like a Windows Calculator.
 10. Write a function procedure to find simple interest
 11. Write an event procedure to find the sum of numbers from 1 to selected value. Use a horizontal scroll bar to set the maximum value.
 12. Create a Data base with the following given fields using Data Visual Manger Student Number, Name, Tamil, English, Maths, Physics, Chemistry marks.
 13. Create a Menu Control using File New, Open, Save, Save as, Close, Exit, Edit, Option, Help
 14. Create the pop- up menu items Bold, Italic, Underline, Blue, Green, Red, Black, Exit. Place a text box in the form. On selecting an item in the pop-up menu the corresponding effect should be displayed.

SEM. II CORE PAPER-1 : ADVANCED JAVA PROGRAMMING

Unit-I

Introducing Java-The Evolution of Java-The logical evolution of C to C++ and Java-Object oriented programming concepts and java programming with java. Getting started with Java Developer’s kit(JDK)- The Java developer’s environment. The Java browser and the world wide web –Navigating the world wide web –using URL’s- web surfing with Java enhanced browsers –Web-Hot spots for Java developers-Java tools-Java language. **(12L)**

Unit-II

Fundamentals of Java language-Token-Using data types-Expressions-Declarations-control flow-Building objects-An introduction to classes- working with objects-packages-Inheritance-Interfaces-threads-exceptions-streams. (10L)

Unit-III

Java API packages, The structure of API Packages. Using the Java API, API web reference Structure. The Java Applet class, Java language- packages and its classes. The AWT class library-Introduction to the AWT-Using the frame class to implement application windows-Implementing dialog boxes with dialog class –organizing the components using the panel and layout classes-using common GUI controls-using Fonts - image related classes-using scroll bars. The java I/O and utility class libraries. The Net and debug class libraries (13L)

Unit-IV

Defining the applet structure- building the applet- The Java extensions to HTML – Adding animation to web documents. The reducing animation flickers- Publishing a Java- presentation on the web. Applets reuse-adding functionality to existing applets –when to reuse –when to rewrite-extending an applet-Testing the extended applet.

JDBC: Java Database Connectivity, Types of JDBC drivers, Writing JDBC applications, Types of Statement objects, Types of resultset, Inserting an updating records, using transactions. (13L)

Unit-V:

Java Servlets: Java Servlets and CGI Programming –A Simple Java Servlet –Anatomy of a Java Servlet Reading Data from a Client –Sending Data to a Client – Working with Cookies Java Server Pages: JSP-JSP tags-Tomcat-Request String –User sessions-Cookies-Session Object. (12L)

REFERENCE BOOKS

1. Peter Norton And William Stanek –Peter Norton’s Guide to Java Programming- Techmedia-1997
2. Alan.R.Willamson and Ceri L.Moran-Java Database Programming –Prentice Hall 1997.
3. C.Muthu, Programming with Java, 2nd Edition ,VNI
4. Joseph O’Neil, Java Beans Programming, TMH

SEM. II CORE PAPER-2 : RDBMS CONCEPTS AND ORACLE

Unit-I

Introduction – Purpose of data base systems – Data Models – Data Languages- Transaction management- storage Management-DBA –Database Users – System Structures – E-R Models- Entity and Entity Relationships – Mapping constraints and E-R Diagrams. **(10L)**

Unit-II

Structure of Relational databases– Relational Algebra – Tuple Relational calculus – Domain Relational Calculus- Relational commercial languages (SQL, QBE, QUEL)- Integrity constraints –Normalization – Boyce –Codd – Third and Fourth normal forms – domain – Key normal form. **(13L)**

Unit-III

Basic SQL Operations – creating a table – Insert- Rollback-Commit – AutoCommit-Delete- Update- Select, From, where and Order by -Single value tests – Like – simple tests against a list of values – Combining logic – Combining tables -Dropping tables - Dropping a column- creating a table from a table – Date functions – Conversion functions- Translate-Decode-Creating a view – Advanced sub queries-Outer joins-Natural & Inner joins-Union, Intersect & Minus – synonyms- indexes- Tablespace -Clusters- Sequences. **(12L)**

Unit-IV

Basics of Object – Relational databases: Objects – Abstract Data types – Nested tables - Varying arrays – Large objects –References - Object Views – Naming conventions for objects- Structure of an Object.

Users, Roles and Privilege: Creating a user – password management - Three Standard roles – Format for Grant command – Revoking privileges – what users can Grant: Moving to another user- Create synonym – Create a role – Granting privileges to a role – Granting a role to another role – Adding password to a role – Removing a password from a role – Enabling & Disabling roles – Revoking privileges from a role – dropping roles. **(13L)**

Unit-V

An Introduction to PL/SQL: PL/SQL overview- Declarations section - Executable commands section – Exception handling section – Triggers: Syntax – Types of Triggers: Row Level – statement – level – before & after – instead of – Schema – Database – Level triggers – Enabling & Disabling triggers – Replacing & Dropping triggers – Procedures, functions & Packages: syntax – Compile – Replace – Drop procedure, Functions & Packages – Cursor Management. **(12L)**

REFERENCE BOOKS

1. Database System Concepts– Abraham Silberchatz, Henry k. Horth, McGraw Hill – 2001.
2. ORACLE 9i – The Complete Reference – Kevin Loney, George Koch & The Experts at Tusc, Tata McGraw Hill Publishing company Ltd., 2002.

SEM.II CORE PAPER-3 : PRINCIPLES OF INFORMATION TECHNOLOGY

Unit-I

INTRODUCTION TO COMPUTERS – Generations of modern computers – Classification of digital computer systems – Anatomy of a digital computer – computer software – Hardware/software interaction – Classification of software – Operating systems (functions & classification of Os) – Introduction to Database Management system (DBMS – benefits – functions – DB users). (12L)

Unit-II

Telecommunications - Introduction to Telecommunications: Analog and Digital Signals - Modulations - Types of modulations - Pulse modulation techniques – digital modulation – modems

Computer Networks: Overview of networks - Communication processors - Communication media - Telecommunication Software – Types of network – network topology.

Communication System : Radio- TV – Microwave systems – Communication satellites – Radar – Fiber optics – ISDN – ADSL – T1 & T3 line connection. (12L)

Unit-III

Introduction to Multimedia – Multimedia Applications:- Multimedia in education and training – Multimedia in entertainment – multimedia in marketing – **Introduction to Virtual reality:** History of VR – present uses of VR – Future of VR. (10L)

Unit-IV

New Technologies in Information Technologies- Introduction to Hypermedia – Artificial Intelligence & Business Intelligence – Knowledge Discovery in Databases (KDD) – Data mining and On_Line Analytical Processing (OLAP)- Geographical Information System(GIS) (13L)

Unit-V

Application of Information Technology -Computers in business and Industry – Computers at Home – Computers in education and training- Computers in Entertainment Science, Media & Engineering- Mobile computing. (13L)

REFERENCE BOOKS

1. Fundamental of Information Technology (second edition), Alexis Leon and Mathew Leon-Leon Vikas publication.
2. Information Technology – Dennis P.Curtin, Kim Foley, Kunalson, TATA McGRAW – Hill edition.

SEM.II CORE PAPER-4 : EMBEDDED SYSTEMS

Unit-I

Embedded systems Overview - Design Challenge – Optimizing Design Metrics, Processor Technology, IC Technology – Introduction- Full Custom (VLSI) IC Technology -Semi Custom (ASIC) IC Technology, Programmable Logic Device (PLD) IC Technology.-Design Technology, Trade – Offs- Custom Single – Purpose Processors: Hardware - Combinational Logic, Sequential Logic, Custom Single - Purpose Processors Design, Optimizing Custom Single - Purpose Processors. (12L)

Unit-II

General Purpose Processors: Software – Introduction- Basic Architecture-Operation-Programmer’s View - Development Environment - Application – Specific Instruction – Set Processors, Selecting a Microprocessor, General Purpose Processor Design - Standard Single - Purpose Processors: Peripherals – Introduction - Timers - Counters and watchdog Timers - UART - Pulse width modulators - LCD Controllers - Keypad Controllers. (12L)

Unit-III

Memory - Introduction, Memory write ability and storage permanence - Common Memory Types - Composing Memory, Memory Hierarchy and cache - Advanced RAM. Interfacing – Introduction Communication Basics - Microprocessor Interfacing: I/O Addressing - Microprocessor Interfacing: Interrupts - Microprocessor Interfacing: Direct Memory Access - Arbitration, Multilevel Bus Architectures - Advanced Communication Principles - serial Protocols - Parallel Protocols-wireless protocols. (10L)

Unit-IV

State Machine and Concurrent Process Models - Introduction, Model vs Languages, Text vs Graphics, An Introductory example- A Basic State Machine Model: Finite – state machines- Finite - state machine with data path Model: FSMD - Using state machines- HCFSM and the State charts Language- Program – state machine model- process model Concurrent processes - Communication among Processes - Synchronization among processes - Implementation, Data flow model- Real time systems. (13L)

Unit-V

Advanced Embedded Systems: ATmega Processors-Introduction-architecture-instruction set-SREG-general purpose registers-stack-interrupt vectors AT 8535 Processor-Serial Ports-Memory map-Addressing modes-Operational features and programming aspects-control block-choosing the prescaler-ATmega Analog to digital converters-Serial I/O-Programmable logic-

Introduction to Xmega family-Infrared communication-Data encryption and decryption-DMA.
(13L)

REFERENCE BOOKS

1. Frank Vahid/Tony Givargis – Embedded System Design, A unified Hardware /Software Introduction – John Wiley & Sons Inc.
2. B.Kanta Rao-Embedded Systems-PHI Learning Private Limited, 2011.

ELECTIVE-I Group (A) : MANAGEMENT INFORMATION SYSTEMS

Unit-I

Introduction to Management of Information Systems-Introduction - Role and Importance of Management-Process of Management –Organization structure and theory –Strategic Management of Business.
(12L)

Unit-II

Basics of Management Information Systems-Basics of Management Information Systems-Decision making –Information Systems-Systems analysis and design –development of MIS-Choice of information Technology.

Nature of it decision, Information Technology to implementation plan, choice of the information Technology and the Management Information System.
(12L)

Unit -III

Application of Management Information Systems- Application in Manufacturing Sector - Applications in Service Sector – Decision Support Systems – Enterprise Management Systems.
(10L)

Unit-IV

Technology in Management Information Systems – Technology of Implementation Systems-Database Management Systems – Object Oriented Technology : Conceptual presentation. Client- Server architecture – Networks.
(12L)

Unit -V

Business Reprocess Engineering, Data Warehouse: Architecture of Implementation, Electronic Business Technology, WEB: A tool for Business Management. Case study: A Comprehensive case study on MIS, Information Management. System Development Cycle, Enterprise Management System, MIS in Research environment, Role of MIS in Consumer Goods Industry, Role of MIS in Capital Goods Industry, Comparison of Internet and Intranet Applications, knowledge of Management.
(14L)

REFERENCES BOOKS

1. W.S. Jawadkar - Management Information Systems – Second Edition - Tata McGraw Hill -2002.
2. Robert Schulthesis & Mary Summer - Management Information Systems- TheManager's View – Tata McGraw Hill -1999.

ELECTIVE-I Group (B) BIG DATA ANALYTICS

Unit-I

A new paradigm for big data: Scaling with a traditional database – Desired properties of a Big Data System-The problems with fully incremental architectures-Lambda Architecture-Recent Trends in Technology.

Batch Layer: DATA model for Big DATA - The properties of data- the fact-based model for representing data- Graph schemas. **Data Model for Big Data:** Why serialization framework? - Apache thrift – Limitations of serialization frameworks. **(12L)**

Unit-II

Data Storage on the batch layer: Storage requirements for the master dataset – Choosing a storage solution for the batch layer – How distributed filesystems work – Storing a master dataset with distributed filesystem – Vertical partitioning – Low-level nature of distributed filesystems – Storing the SuperWebAnalytics.com master dataset on a distributed filesystem. **(10L)**

Unit-III

Data storage on the batch layer: Illustration: Using the Hadoop Distributed File System – Data storage in the batch layer with Pail – Storing the master dataset for SuperWebAnalytics.com.

Batch layer: Motivating examples – Computing on the batch layer – Recomputation algorithms vs. incremental algorithms –Scalability in the batch layer – MapReduce: a paradigm for Big Data computing – Low-level nature of MapReduce-Pipe diagrams: a higher-level way of thinking about batch computation

Batch layer: Illustration: An illustrative example- Common pitfalls of data-processing tools – An introduction to JCascalog – Composition.

An example batch layer: Architecture and algorithms: Design of the SuperWebAnalytics.com batch layer – Workflow overview – Ingesting new data – URL normalization – User-identifier normalization – Duplicate pageviews – Computing batch views. **(13L)**

Unit-IV

Serving layer: Performance metrics for the serving layer- The serving layer solution to the normalization/denormalization problem- Requirements for a serving layer database- Designing a serving layer for Super WebAnalytics.com – Contrasting with a fully incremental solution.

Serving layer: Illustration: Basics of ElephantDB – Building the serving layer for SuperWebAnalytics.com (12L)

Unit-V

Speed Layer: Realtime views: Computing realtime views – Storing realtime views – Challenges of incremental computation – Asynchronous versus Synchronous updates – Expiring realtime views.

Realtime views: Illustration: Cassandra’s data model – Using Cassandra.

Queuing and stream processing: Queuing – Stream processing – Higher-level, one-at-a-time stream processing – SuperWebAnalytics.com speed layer.

Queuing and stream processing: Illustration: Defining topologies with Apache Storm – Apache Storm clusters and deployment –Guaranteeing message processing – Implementing the SuperWebAnalytics.com unique-over-time speed layer.

Lambda Architecture in depth: Defining data systems – batch and serving layers – Speed layer – Query layer.

Case Studies: An example of Batch Layer implementation. (13L)

REFERENCE BOOKS:

1. “Big Data Principles and best practices of scalable real-time data systems”, Nathan Marz, James Warren, Manning publications co., Edition 2016, published in India by Dreamtech Press, 19-A, Ansari Road, Daryaganj, New Delhi.
2. Big Data: A Revolution That Will Transform How We Live, Work, and Think by Viktor Mayer-Schönberger, Kenneth Cukier Published March 5th 2013 by Houghton Mifflin Harcourt.

II SEMESTER PRACTICAL LISTS

JAVA PROGRAMMING LAB –Practical Lists

1. Programs using simple java classes
2. Preparation of employee payroll using arrays and control structures
3. Write a program to prepare mark sheet using inheritance
4. Prepare a salary slip of an employee with personal details using interface
5. Write a java program using string classes
6. Write a java program to design a calculator to perform arithmetic operation
7. Write a java program to create and implement an interface
8. Write a java program to create a thread
9. Program Using runnable interface
10. Write a program using java utilities
11. Database applications using JDBC connectivity
12. Simple Java AWT application
13. Simple Java Servlet application
14. Simple JSP internet application.

ORACLE LAB –Practical Lists

1. Table creation and Manipulations – Insert, Delete, Select and Update
2. Use of constraints – primary key, references, unique, not null, default etc. in Table creation.
3. Creation and use of sequence, index schema objects in table manipulations
4. PL/SQL program to generate Multiplication Table
5. PL/SQL program for cursor Management
6. PL/SQL program for Raising application error.
7. Create of function to check whether the given string is a palindrome or not.
8. PL/SQL program for demonstrating user defined Exception in oracle
9. PL/SQL program for demonstrating built-in Exception

10. PL/SQL program for demonstrating built-in Exception
11. Creation of procedure for electricity bill preparation using table
12. PL/SQL program for demonstrating trigger procedure.

SEM. III CORE PAPER-1: WEB DESIGNING

Unit-1 Web programming Basics and Installations

Web Publishing: A Quick look-HTML 4.0: the web Publishing Foundation- HTML basics- Putting your Server to work-Server side programming- XML Basics. **(12L)**

Unit-II Installation and Configuration

Getting up and running: Installation Quick Start Guide- Installing and configuring MySQL- Installing and configuring Apache-Installing and configuring PHP. **(10L)**

Unit-III PHP Language Structure

The Building blocks of PHP- Flow Control Functions in PHP- Working with Functions- Working with Arrays- Working with Objects- Working with Strings, Dates and Time- Working with Forms- Working with Cookies and User Sessions- Working with Files and Directories Working with Images **(14L)**

Unit-IV PHP and MySQL Integration

Understanding the Database Design- Process Learning Basic SQL Commands Using Transactions and Stored Procedures in MySQL- Interacting with MySQL Using PHP. **(12L)**

Unit-V Basic Projects

Managing a Simple Mailing List- Creating an Online Address Book- Creating a Simple Discussion Forum- Creating an Online Storefront and shopping Cart Mechanism- Creating a Simple Calendar- Restricting Access to Your Applications- Logging and Monitoring Web Server Activity- Application Localization- Working with XML- Connecting to Web Services Apache Performance Tuning and Virtual Hosting- Setting Up a Secure Web Server- Optimizing and Tuning MySQL. **(12L)**

REFERENCE BOOKS:

1. Sam Teach Yourself PHP, MySQL and Apache All in One, 5th Edition, Julie Meloni
2. Dynamic Web Publishing, Second Edition, Shelley Powers, Techmedia
3. Steve Suehring, Tim Converse and Joyce Park, "PHP 6 and MySQL 6 Bible", Wiley India

reprint, 2009.

4. Robert Sheldon, Geoff Moes, "Beginning MySQL", Wrox, 2005.

5. BEN FORTA, "MySQL Crash course "SAMS, 2006.

SEM. III CORE PAPER-2 : OPERATING SYSTEMS

Unit-I

Operating System Overview: Objectives and Functions - Processes: Process Description and Control – UNIX SVR4 Process Management – Threads and Multithreading – Symmetric Multiprocessing - Windows Thread Management - Solaris Thread and SMP Management - Linux Thread Management - Android Thread Management **(13L)**

Unit-II

Mutual Exclusion and Synchronization: Semaphores – Monitors - Message Passing – producer-consumer problem – readers writers problem - Principles of Deadlock – Deadlock prevention – Avoidance – Detection **(12L)**

Unit-III

Virtual Memory Management: Paging – segmentation - Operating System Software policies - Windows Memory Management - Android Memory Management - Uniprocessor Scheduling: Types of Scheduling - Scheduling Algorithms - Real-Time Scheduling **(10L)**

Unit-IV

I/O Management and Disk Scheduling: I/O Buffering - Disk Scheduling – RAID - File Management : File Organization and Access - Secondary Storage Management – File Allocation Methods – Free Space Management - Windows File System - Android File Management - Embedded Operating Systems: Characteristics – Ecos **(13L)**

Unit-V

Operating System Security: Basic concepts - Intruders and Malicious Software - viruses - Distributed Processing, Client/Server, and Clusters: Client/Server Computing - Distributed Message Passing - Remote Procedure Calls – Clusters - Windows Cluster Server – Sun Cluster **(12L)**

REFERENCE BOOKS:

1. Operating Systems-Internals and Design Principles, Williams Stallings, Pearson, 8th Edition, 2014.
2. Modern Operating Systems, Andrew S. Tanenbaum, Pearson,, 4th Edition, 2014.
3. Operating System Concepts, Abraham Silberschatz , Peter B. Galvin, Greg Gagne, John Wiley & Sons, 8th Edition, 2008.

SEM. III CORE PAPER-3 : NETWORK SECURITY AND CRYPTOGRAPHY

Unit-I

Introduction, Attacks, services and Mechanisms - security attacks - security services - A model for internetwork security - Internet standards and RFCs. Classical Encryption Techniques: symmetric cipher Model - Substitution Techniques -Transportation Techniques Rotor Mechanism – Steganography. **(12L)**

Unit-II

Block ciphers and the data encryption standard simplified DES - Block Cipher Principles -The Data encryption standard -The strength of DES - Differentials and Linear Cryptanalysis -Block Cipher design principles -Block Cipher modes of operations. Public Key Cryptography and RSA: Principles of Public - Key Cryptosystems The RSA Algorithm. **(13L)**

Unit-III

Key Management; Other Public-Key Cryptosystems: Key Managements- Diffie Hellman Key Exchange-Elliptic curve Arithmetic - Elliptic curve Cryptography Message Authentication & Hash functions: Authentication Requirements-Authentication functions-message Authentication Codes- Hash functions- Security of Hash functions & MACS. Digital Signatures -Authentication Protocols -Digital Signature Standard. **(13L)**

Unit-IV

Authentication applications: Kerberos X 509 Authentication service. Electronic Mail security: Pretty good Privacy - S/MIME 445 IP Security: IP Security overview - IP Security Architecture -Authentication Header - Encapsulation security Payload. **(10L)**

Unit-V

Web Security: Web Security Considerations - Secure Sockets Layer and Transport Layer Security - Secure Electronic Transactions System Security: Intruders - Intrusion detection - Password Management. Firewalls: Firewalls Design Principles - Trusted Systems **(12L)**

REFERENCE BOOKS:

1. William Stallings,"CRYPTOGRAPHY AND NETWORK SECURITY - PRINCIPLES AND PRACTICES", Pearson Education, Third Edition, 2003.
2. William Stallings,"NETWORK SECURITY ESSENTIAL - APPLICATIONS AND STANDARDS", Pearson Education, 2003.
3. Atul kahate,"CRYPTOGRAPHY AND NETWORK SECURITY", TMCH, 2003

4. Charlie Kanfman, Radio Pearlman, Mike Speciner, "NETWORK SECURITY", Second Edition, Pearson Education Asia.

SEM. III CORE PAPER-4 : Software Testing

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. (10L)

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. (12L)

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. (13L)

Unit-IV

Logic based testing – Motivational overview – Decision tables – Path expressions – KV charts – Specifications – States, state graphs and transition testing – State Graph – Good & bad states – State testing metrics and Complexity. (13L)

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. (12L)

REFERENCE BOOKS

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.

SEM. III CORE PAPER-5: RESEARCH METHODOLOGY

Unit-I

Research Methodology: An Introduction - Meaning of Research - Objectives of Research - Types of Research, Motivation in Research - Research Approaches, Significance of Research - Research Methods Verses Methodology - Research and Scientific Method - Research Process - Criteria of Good Research - Problems Encountered by Researchers in India. Defining the Research Problem: What is a Research Problem? - Selecting the Problem - Technique Involved in Defining a Problem - Research Design: Meaning - Need for research Design - Features of a

Good Design - Important Concept relating to Research Design - Different Research Designs - Basic Principles of Experimental Designs. (12L)

Unit-II

Sampling Design: Census and sample survey - Implications of a sample design - Steps in sample design - Criteria of selecting a sampling procedure - Characteristics of a good sample design - Different types of sample designs - How to select a random sample? - Random sample from an infinite Universe - Complex random sampling designs - Measurement and scaling Techniques: measurement in research - Measurement scales - Sources of error in measurement - Tests of sound measurements - Technique of developing measurement tools - Scaling, meaning of scaling - Scale classification bases - Important scaling techniques - Scale construction techniques. (12L)

Unit-III

Methods of Data Collection - Collection of Primary Data - Observation Method - Interview method - Collection of Data through Questionnaires - Collection of Data through Schedules - Some Other Methods of Data Collection - Collection of Secondary Data - Selection of Appropriate Method for Data Collection - Interpretation and Report writing - Meaning of Interpretation, Why Interpretation? - Technique of Interpretation, Precaution in Interpretation - Significance of Report Writing - Different Steps in Writing Report - Layout of the Research Report - Types of Reports - Mechanics of Writing a Research Report - Precautions for Writing Research Reports. (12L)

Unit-IV

Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi-Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate’s correction and its applications – Analysis of variance(ANOVA) : Concept – One way ANOVA – ANOVA in test in Latin Square Design (12L)

Unit - V

Algorithmic Research – Introduction - Algorithmic Research Problems - Types of Solution procedure/Algorithm - Steps of Development of Algorithm - Steps of algorithmic Research - Design of Experiments and Comparison of Algorithms - Meta Heuristics for Combinatorial Problems - The Computer: Its Role in research - The computer and Computer Technology - The Computer System - Important Characteristics - Computer Applications- Computers and Researchers. (12L)

REFERENCE BOOKS

1. C.R.Kothari, "Research Methodology Methods and Techniques", (Second Revised Edition), New Age International Publishers, New Delhi, 2010.
2. R.Panneerselvam, "Research Methodology", PHI Learning Private Limited, New Delhi, 2009.

ELECTIVE-II Group (A) : DATA WAREHOUSING AND MINING

Unit-I

Introduction: Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases – Relational databases – Data warehouses – Transactional databases – Object oriented databases – Spatial databases – Temporal databases – Text and Multimedia databases – Heterogeneous databases - Mining Issues – Metrics – Social implications of Data mining **(12L)**

Unit-II

Data Preprocessing: Why Preprocess the data – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization. **(11L)**

Unit-III

Data Mining Techniques: Association Rule Mining – The Apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining **(11L)**

Unit-IV

Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy **(13L)**

Unit-V

Clustering Techniques: cluster Analysis – Clustering Methods – Hierarchical Methods – Density Based Methods – Outlier Analysis – Introduction to Advanced Topics: Web Mining , Spatial Mining and Temporal Mining **(13L)**

REFERENCE BOOKS

1. J. Han and M. Kamber , 2001, Data Mining: Concepts and Techniques, Morgan Kaufmann, .New Delhi-27
2. M. H.Dunham, 2003, Data Mining : Introductory and Advanced Topics , Pearson Education, Delhi.
3. Paulraj Ponnaiah, 2001, Data Warehousing Fundamentals, Wiley Publishers.
4. S.N. Sivananda and S. Sumathi, 2006, Data Mining, Thomsan Learning, Chennai.

ELECTIVE-II Group (B) MOBILE COMPUTING

Unit-I

Introduction: Wireless transmission, Frequencies for radio transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulations, Spread spectrum, MAC, SDMA, FDMA, TDMA, CDMA, Cellular Wireless Network. **(12L)**

Unit-II

Telecommunication systems: GSM, GPRS, DECT, UMTS, IMT-2000, Satellite Networks, Basics, Parameters and Configurations, Capacity Allocation, FAMA and DAMA, Broadcast Systems, DAB, DVB. **(12L)**

Unit-III

Wireless LAN: IEEE 802.11, Architecture, Services, MAC, Physical layer, IEEE802.11a-802.11b standards, HIPERLAN, BlueTooth. **(12L)**

Unit-IV

Mobile IP, Dynamic Host Configuration Protocol, Routing, DSDV, DSR, Alternative Metrics **(12L)**

Unit-V

Traditional TCP, Classical TCP improvements, WAP, WAP 2.0, WML Basics, WML Cards. **(12L)**

REFERENCE BOOKS

1. Jochen Schiller, "Mobile Communications", 2/e, PHI/Pearson Education, 2003.
2. William Stallings, "Wireless Communication and Networks", PHI/Pearson Education, 2002
3. Kaveh Pahlaven, Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.
4. Hazysztof Wesolowshi, "Mobile Communication Systems", John Wiley and Sons Ltd, 2002.

III SEMESTER PRACTICAL LIST

WEB DESIGNING AND NETWORK LAB

Web Designing – Practical Lists

1. Write a HTML code to display information about your college use
 - 1)Bold Tag
 - 2)Centre Tag
 - 3)Heading & Font tags. Add background colour and picture
2. Create a HTML document to display a list of four flowers and link each one to another document displaying brief description of the flower. Add pictures wherever possible.
3. Create a table to display the marks obtained in the exam.
4. Write an HTML code to display a list of 5 cars in a frame .Link each one to a brief description in second frame The left frame should display the list and the right frame should display the paragraph about the frame.
5. Page hit counter
6. Input/output operations
7. Reading/writing files and Directories
8. Calendar application using PHP
9. MySQL Connectivity and Database manipulations
10. Session maintenance in PHP.

Network- Practical Lists

1. Write a socket program for Echo commands
2. Write a socket program for Ping commands
3. Write a socket program for Talk commands
4. Create a socket (TCP) between two computers and enable file transfer between them.
5. Write a socket for HTTP for Web page upload & download
6. Create a Socket (UDP)
7. Write a program for TCP Module implementation
8. Perform a case study for the shortest path routing algorithms to select the network and to select the network path.