

Vinayaka Missions Research Foundation, Salem**Bachelor of Computer Science****Curriculum - 2017 (Choice Based Credit System)**

Sl. No.	Semester	Courses	Credits	Total Credits
1	I	Foundation Course I: Tamil I / Hindi-I	3	28
2		Foundation Course II: English - I	3	
3		Core Course-I: Problem Solving using Computer	4	
4		Core Course-I: Software Lab using Python	2	
5		Core Course II : Programming in C	4	
6		Core Course II : Programming in C Lab	2	
7		Ability Enhancement course - I: Environmental Science	4	
8		Generic Elective I	5+1	
9	II	Foundation Course I: Tamil II / Hindi-II	3	22
10		Foundation Course II: English - II	3	
11		Core Course III : Fundamentals of Data Structure	4	
12		Core Course-III: Fundamentals of Data Structure Lab	2	
13		Core Course IV : Object Oriented Programming using C++	4	
14		Core Course IV : Object Oriented Programming using C++ Lab	2	
		Skill Enhancement Course - 1: Yoga and Meditation	4	
15	III	Core Course-V: Microprocessor and its applications	5+1	26
16		Core Course-VI: Database Management Systems	4	
17		Ability Enhancement - II: English Communication	4	
18		Core Course-VI: Database Management Systems Lab	2	
19		Core Course VII :Visual Basic .Net Programming	4	
20		Core Course VII :Visual Basic .Net Programming Lab	2	
22		Skill Enhancement Course - 2	4	
23	IV	Core Course-VIII: Programming in JAVA	4	22
24		Core Course-VIII: Programming in JAVA Lab	2	

Curriculum and Syllabus for B.Sc. Computer Science - R 2017

25		Core Course IX : Operating System	4	
26		Core Course IX : Operating System lab	2	
27		Skill Enhancement Course - 3	4	
28		Core Course X : Software Engineering	4	
29		Core Course X: Software Engineering lab	2	
30	V	Generic Elective II: Interdisciplinary	5+1	22
31		Skill Enhancement Course -4	4	
32		Discipline Specific Elective - I	4+2	
33		Discipline Specific Elective - II	4+2	
34	VI	Discipline Specific Elective - III	4+2	16
35		Inter Disciplinary Theory*	4	
36		Discipline Specific Elective- IV: (Compulsory): Project Work/Dissertation	6	
			Total Credits	136

Total Credits: 132 + 4 = 136

Inter Disciplinary Theory* (Optional & credit will not be included for CGPA calculation)

S. No.	Nature of Course	No. of Courses	No of Credits
1	Foundation Courses	4	12
2	Core Courses	10	60
3	Discipline Specific Elective	3	18
4	Generic Electives	2	12
5	Ability Enhancement courses	2	8
6	Skill Enhancement courses: 2 Credits	4	16
7	Interdisciplinary course	1	4
8	Project Work/Dissertation	1	6
	Total	27	136

Electives : (each 6 Credits)	
Discipline Specific Elective	
Discipline Specific Elective I (Any one)	
1	Software Testing
2	Internet Technologies
3	Compiler Design
Discipline Specific Elective II (Any one)	
1	Mobile Applications
2	Scripting Languages
3	Information Security
Discipline Specific Elective III (Any one)	
1	Data Mining
2	Building Internet of Things
3	Cloud Computing
Discipline Specific Elective IV (Compulsory)	
1	Project Work/Dissertation
Generic Electives (Interdisciplinary) (Any Two Choices)	
1	Numerical and Statistical Methods
2	Integral Calculus and Differential Equations
3	Operations Research
4	Research Methodology

Ability Enhancement Courses (each 4 Credits)	
I	Ability Enhancement Compulsory Courses (AECC)
1	Environmental Science
2	English Communication
II	Skill Enhancement Courses (Any Four)
1	Office Automation Tools
2	HTML Programming
3	MySQL (SQL/PL-SQL)
4	PHP Programming
5	System Administration and Maintenance
6	Programming in SCILAB
7	Android Programming
8	XML Programming

9	R Programming
10	Yoga and Meditation

VINAYAKA MISSIONS RESEARCH FOUNDATION

FIRST YEAR B.Sc. Computer Science

SEMESTER I

CORE COURSE - I

PROBLEM SOLVING USING COMPUTER

L T P C

4 0 0 4

OBJECTIVE:

1. To review the ideas of computer science, programming, and problem-solving.
2. To understand abstraction and the role it plays in the problem-solving process.
3. To understand and implement the notion of an abstract data type.
4. To review the Python programming language.

UNIT I:

(12)

Computer Fundamentals: Introduction to Computers: Characteristics of Computers, Uses of computers, Types and generations of Computers, Basic Computer Organization - Units of a computer, CPU, ALU, memory hierarchy, I/O devices, Logic Gate, Number system

UNIT II:

(12)

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation. Flowcharting, algorithms, structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

UNIT III:

(12)

Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).

UNIT IV:

(12)

Creating Python Programs: Input and Output Statements, Control statements (Looping-while Loop, for Loop, Loop Control, Conditional Statement- if...else, Difference between break, continue and pass).

UNIT V:

(12)

Structures:Numbers, Strings, Lists, Tuples, Dictionary, Date & Time, Modules, Defining Functions, Exit function, default arguments.

Total hours: 60

TEXT BOOKS :

1. P. K. Sinha &PritiSinha, “Computer Fundamentals”, BPB Publications, 2007.
2. T. Budd, Exploring Python, TMH, 1st Ed, 2011

REFERENCE BOOKS:

1. P. K. Sinha &PritiSinha, “Computer Fundamentals”, BPB Publications, 2007.
2. Dr. Anita Goel, Computer Fundamentals, Pearson Education, 2010.
3. Python Tutorial/Documentation www.python.org2010
4. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : Learning with Python , Freely available online.2012
5. <http://docs.python.org/3/tutorial/index.html>
6. <http://interactivepython.org/courselib/static/pythonds>
7. <http://www.ibiblio.org/g2swap/byteofpython/read/>

VINAYAKA MISSIONS RESEARCH FOUNDATION

FIRST YEAR B.Sc. Computer Science

SEMESTER I

CORE COURSE - I

SOFTWARE LAB USING PYTHON

L T P C

0 0 4 2

Section: A (Simple programs)

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice Versa depending upon user's choice.
2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :
 - Grade A: Percentage ≥ 80
 - Grade B: Percentage ≥ 70 and < 80
 - Grade C: Percentage ≥ 60 and < 70
 - Grade D: Percentage ≥ 40 and < 60
 - Grade E: Percentage < 40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. WAP to display the first n terms of Fibonacci series.
5. WAP to find factorial of the given number.
6. WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$
7. WAP to calculate the sum and product of two compatible matrices.

Section: B (Visual Python):

All the programs should be written using user defined functions, wherever possible.

1. Write a menu-driven program to create mathematical 3D objects
 - Curve
 - Sphere
 - Cone

- Arrow
 - Ring
 - Cylinder
2. WAP to read n integers and display them as a histogram.
 3. WAP to display sine, cosine, polynomial and exponential curves.
 4. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered By the user.
 5. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula $m=60/(t+2)$, where t is the time in hours. Sketch a graph for t vs. m, where $t \geq 0$.
 6. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows:
$$P(t) = (15000(1+t))/(15 + e^t)$$
where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.
 7. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
 - I. velocity wrt time ($v=u+at$)
 - II. distance wrt time ($s=u*t+0.5*a*t*t$)
 - III. distance wrt velocity ($s=(v*v-u*u)/2*a$)

VINAYAKA MISSIONS RESEARCH FOUNDATION
FIRST YEAR B.Sc. Computer Science
SEMESTER I
CORE COURSE - II
PROGRAMMING IN C

L T P C

4 0 0 4

OBJECTIVE:

At the end of this course the learner is expected:

1. To acquire basic knowledge about Programming in C
2. To gather extensive knowledge in C programming and developing programming skills
3. To strengthen the knowledge on structures, arrays etc., of C programming

UNIT I - OVERVIEW OF C (12)

Introduction- Importance of C- Basic Structure of C program- Tokens-Variables- Data types- Operators and Expression- Managing Input and Output Operators.

UNIT II - CONDITIONAL STATEMENTS (12)

If statement- switch statement- goto statement- while statement- do statement-for statement- continue statement- break statement.

UNIT III - ARRAYS AND FUNCTIONS (12)

One dimensional array- Two dimensional array- Multidimensional array-Built in functions (Library functions): String Handling functions-User defined functions.

UNIT IV - STRUCTURES, UNIONS AND POINTERS (12)

Structure definition-Arrays of structures- Structures and functions-Unions- Understanding pointers- Declaring and initializing pointers- Pointers and arrays-Pointers and functions- Pointers and structures.

UNIT V - FILE MANAGEMENT (12)

Defining and Opening a file- Closing a file- Input output operations on files-Error Handling during I/O operations- Command line arguments.

Total hours: 60

TEXT BOOK

1. Balagurusamy.E (2008), "*Programming in ANSI C*", Second Edition, Tata McGraw Hill.

REFERENCES

1. KamthaneAshok.N (2013), "*Programming in C*", 2nd Edition, Pearson Education.
2. Yashvant P. Kanetkar (2008), "*Let us C*", 8th Edition, Infinity science press.

VINAYAKA MISSIONS RESEARCH FOUNDATION

FIRST YEAR B.Sc. Computer Science

SEMESTER I

CORE COURSE - II

PROGRAMMING IN C LAB

L T P C

0 0 4 2

1. Program to check whether a number is positive or negative or zero using if statement.
2. Program to check vowel or consonant using switch case statement.
3. Program to check whether a number is prime or not using while statement.
4. Program to generate multiplication table using do...while statement.
5. Program to check the given string is palindrome or not using for statement.
6. Program to display Fibonacci series.
7. Program to search an element in an array using linear search method.
8. Program to find the smallest and largest number among 'n' numbers.
9. Program to sort elements in an array.
10. Program to add two matrices.
11. Program for manipulating the strings using string handling functions.
12. Program to find the sum of 'n' numbers by making function.
13. Program to calculate factorial of a number using recursion.
14. Program to generate the mark sheet of the student using structure.
15. Program to copy the content of one file to other file.

**VINAYAKA MISSIONS RESEARCH FOUNDATION
FIRST YEAR B.Sc. Computer Science
SEMESTER II
CORE COURSE – III
FUNDAMENTALS OF DATA STRUCTURE**

L T P C

4 0 0 4

OBJECTIVE:

At the end of this course the learner is expected:

1. To learn Several data structure concepts like stack, queue, linked list, trees and graphs
2. To learn the Applications of data structures.
3. To improve the Problem solving quality using data structure techniques.

UNIT I - INTRODUCTION TO DATA STRUCTURES (12)

Definition – types of data structure-abstract data type-array as an abstract data type- representation of array- sparse matrices- asymptotic notation.

UNIT II - STACKS AND QUEUES (12)

Stacks- queue- mazing problem- evaluation of expression- postfixes notation- infix to post fix- multiple stack and queue.

UNIT III - LINKED LIST (12)

Singly linked list- representation of linked singly list- operations on singly linked list-doubly linked list- representation of doubly linked list- operations on doubly linked list-differentiate singly and doubly linked list- circularly singly and doubly linked list

UNIT IV - TREES (12)

Tree Terminology- representation of tree- binary tree- binary tree traversal-operations on tree- applications- Sorting : selection sort- bubble sort- quick sort

UNIT V - GRAPHS (12)

Definition- representation of a graph- operations- breadth first search- depth first search- minimum cost spanning trees- kruskal's algorithm and prim's algorithm-shortest path and transitive closure- single source- floyds algorithm- all pair dijkstra's algorithm.

Total Hours: 60

TEXT BOOK

1. Ellis Horowitz, Sahni, Dinesh Mehta (1999), “Fundamentals of Data Structures in C++”, Golgotha publication, New Delhi.

REFERENCE

1. Weiss Mark Allen (2006), “Data Structure and algorithm analysis”, Pearson Education.

VINAYAKA MISSIONS RESEARCH FOUNDATION

FIRST YEAR B.Sc. Computer Science

SEMESTER II

CORE COURSE – III

FUNDAMENTALS OF DATA STRUCTURE LAB

L T P C

0 0 4 2

1. To calculate simple interest and compound interest using class and objects
2. Adding 2 complex numbers using operator overloading
3. To calculate volume of sphere, cube and rectangle using function overloading
4. Calculate the area of triangle and rectangle using single inheritance
5. Implement PUSH, POP operations of stack using Arrays.
6. Implement add, delete operations of a queue using Arrays.
7. Conversion of infix to postfix using stacks operations.
8. Perform Addition of two polynomials using singly linked list
9. Solve the single source shortest path problem. (Note: Use Dijkstra’s algorithm).
10. Traverse a binary tree in: a) Pre-order b) In-order c) Post-order
11. Sorting a given list of elements in ascending order using the following sorting methods:
 - a) Quick sort
 - b) Merge sort.

12. Perform the following operations in a given graph (i) Depth first search (ii) Breadth first search

**VINAYAKA MISSIONS RESEARCH FOUNDATION
FIRST YEAR B.Sc. Computer Science
SEMESTER II
CORE COURSE – IV
OBJECT ORIENTED PROGRAMMING USING C++**

L T P C

4 0 0 4

OBJECTIVE:

At the end of this Subject the learner is expected:

1. To learn the concepts of class & objects.
2. To perform Inheritance, Overloading of operators, functions and constructors

UNIT I - PRINCIPLES OF OBJECT ORIENTED PROGRAMMING (12)

Object Oriented Programming Paradigms- basic concept of OOPS- benefits of OOP-what is C++-simple C++ program-structure of C++ program- creating a source file – compiling and linking.

UNIT II - TOKENS, EXPRESSION AND CONTROL STRUCTURES (12)

Tokens-keywords-identifiers and constants-basic data types-user defined data types-derived data types-type compatibility-declaration of variables-dynamic initialization of variables-reference variables-operators in C++-manipulators-type cast operator-implicit conversion-operator overloading-control structures.

UNIT III - CLASS AND OBJECTS (12)

Functions in C++- function overloading-Specifying a class- defining member function-arrays within a class-arrays of objects- objects as function arguments- friendly functions-constructor and destructor

UNIT IV - INHERITANCE, POINTER, VIRTUAL FUNCTION AND POLYMORPHISM (12)

Single inheritance-multilevel-multiple inheritance-hierarchical-hybrid-virtual base class-abstract classes-pointers-this pointer-virtual functions-pure virtual functions.-operator over loading- rules for operator overloading

UNIT V - MANAGING CONSOLE I/O OPERATIONS (12)

C++ streams- streams classes-unformatted I/O operations-formatted console I/O operations-managing output with manipulators- exception handling- basics of exception handling.

Total Hours: 60

TEXT BOOK

1. Balagurusamy.E (2008), "Object Oriented Programming with C++", TataMcGraw-Hill Publication.

REFERENCE

1. Herbert Schildt (2003), "C++: The Complete Reference", Tata McGraw publication.

VINAYAKA MISSIONS RESEARCH FOUNDATION

FIRST YEAR B.Sc. Computer Science

SEMESTER II

CORE COURSE – IV

OBJECT ORIENTED PROGRAMMING USING C++ LAB

L T P C

0 0 4 2

LIST OF EXPERIMENTS

1. Write a C++ program to implement the concept of classes and object
 - a. Create a class 'staff', to create different objects and to test the functioning of member functions, constructors and Destructors.
2. write a C++ program to implement the concept Arrays of Objects
 - a. Create Class 'student', create an array of students, find out the student who got the first rank
3. Write a C++ program to implement operator overloading to perform complex arithmetic
4. Write a C++ program to implement the concept of Inheritance
 - a. Create a class 'College', create another class 'department' by using 'college' as a base class, and verify the functions in the derived and base classes. Also to verify by keeping the two functions with same name (one in the base class and another in derived class)
5. Write a C++ program to handle the error using Exception Handling.
6. Write a C++ program to implement stack using array.
7. Write a C++ program to implement Queue using array.
8. Write a C++ program to convert the infix to postfix expression.
9. Write a C++ program for inorder, preorder and post order tree traversals.

10. Write a C++ program for sorting the given set of elements using selection and bubble sort.

**VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER III
CORE COURSE – V
MICROPROCESSOR AND ITS APPLICATIONS**

L T P C

5 1 0 6

Objectives:

1. To understand basic architecture of 16 bit and 32 bit microprocessors.
2. To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
3. To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.

UNIT I

(13)

Introduction to Microprocessor – Evolution of microprocessor – general architecture of microprocessor system – architecture of 8085 A – pin configuration– machine language and assembly language.

UNIT II

(13)

The 8085 instruction set - Instruction classification – instruction and data format – addressing modes – instruction set of 8085 – data transfer operations, arithmetic operations, logic operations, Stack operations, I/O operations and machine control operations – programming techniques such as looping counting and indexing.

UNIT III

(13)

Programming a Microprocessor – Program writing for 8-bit addition, subtraction, multiplication and division – 16 bit addition, subtraction, multiplication – BCD addition and subtraction – multibyte addition and subtraction – BCD to binary and binary to BCD conversion – octal to binary conversion – ASCII to BCD and BCD to ASCII conversions – ASCII to binary and binary to ASCII conversions – biggest and smallest – sorting and searching – block data transfer.

UNIT IV

(13)

Counters and time delays – Time delay using single register and register pair hexadecimal counter – generating pulse waveform. Timing sequences – opcode fetch cycle – memory read cycle – memory write cycle – I/O read cycle – I/O write cycle – WAIT state.

UNIT V

(13)

Data transfer methods - Memory organization – memory mapping – I/O mapping – Programmed data transfer – interrupt driven data transfer – polling techniques – DMA data transfer.

Total Hours: 65

TEXT BOOKS:

1. Introduction to Microprocessor – A.P. Mathur, TMH.

REFERNECE BOOKS:

1. Microprocessor Architecture, Programming and and applications with 8085 / 8085 A' – R.S.GAONKAR, Wiley Eastern Limited

**VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER III
CORE COURSE – VI
DATABASE MANAGEMENT SYSTEMS**

L T P C

4 0 0 4

OBJECTIVE:

To understand basic database concepts, including the structure and operation of the relational data model.

UNIT I: (12)

Introduction to Database Management Systems: Characteristics of database approach, data models, DBMS architecture and data independence.

UNIT II: (12)

Entity Relationship and Enhanced ER Modeling: Entity types, relationships, SQL: Schema Definition, constraints, and object modeling.

UNIT III: (12)

Relational Data Model: Basic concepts, relational constraints, relational algebra, SQL queries.

UNIT IV: (12)

Database design: ER and EER to relational mapping, functional dependencies, normal forms up to third normal form.

UNIT V: (12)

Transaction Management and Concurrency Control: Transaction, Properties of Transactions, States of Transaction, Concurrency Control, Concurrency Control Schemes, SQL Commands for Transaction-BEGIN-COMMIT-ROLLBACK-SAVE-IN Commands.

Total Hours: 60

Text Book:

1. Database Management Systems, Fifth edition, Alexis Leon, Mathews Leon, McGraw-Hill-2005.

Reference Books:

1. Database System Concepts, Abraham Silberschatz, Henry F.Korth, S.Sudharshan, McGraw-Hill-2006, 5th Edition.

2. “An introduction to database systems”, Bipin C. Desai, Galgotia Publications Pvt. Ltd., 1991.

VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER III
CORE COURSE – VI
DATABASE MANAGEMENT SYSTEMS LAB

L T P C
0 0 4 2

Note: Ms-Access/MySQL may be used.

The following concepts must be introduced to the students:

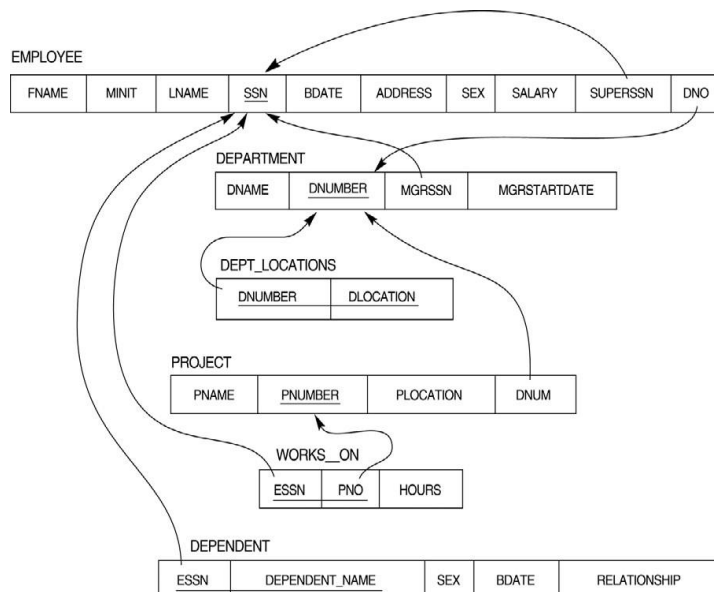
DDL Commands

- Create table, alter table, drop table

DML Commands

- Select , update, delete, insert statements
- Condition specification using Boolean and comparison operators (and, or, not,=,<>,>,<,>=,<=)
- Arithmetic operators and aggregate functions(Count, sum, avg, Min, Max)
- Multiple table queries (join on different and same tables)
- Nested select statements
- Set manipulation using (any, in, contains, all, not in, not contains, exists, not exists, union, intersect, minus, etc.)
- Categorization using group by.....having
- Arranging using order by

Relational Database Schema - COMPANY



Questions to be performed on above schema

1. Create tables with relevant foreign key constraints
2. Populate the tables with data
3. Perform the following queries on the database :
 1. Display all the details of all employees working in the company.
 2. Display ssn, lname, fname, address of employees who work in department no 7.
 3. Retrieve the birthdate and address of the employee whose name is 'Franklin T. Wong'
 4. Retrieve the name and salary of every employee
 5. Retrieve all distinct salary values
 6. Retrieve all employee names whose address is in 'Bellaire'
 7. Retrieve all employees who were born during the 1950s
 8. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)
9. Retrieve the names of all employees who do not have supervisors
10. Retrieve SSN and department name for all employees
11. Retrieve the name and address of all employees who work for the 'Research' department
12. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birthdate.
13. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.
14. Retrieve all combinations of Employee Name and Department Name
15. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.
16. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.
17. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.
18. Select the names of employees whose salary does not match with salary of any employee in department 10.
19. Retrieve the name of each employee who has a dependent with the same first name and same sex as the employee.
20. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.
21. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper headings.
22. Find the sum of the salaries and number of employees of all employees of the 'Marketing' department, as well as the maximum salary, the minimum salary, and the average salary in this department.
23. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
24. For each department, retrieve the department number, the number of employees in the department, and their average salary.

25. For each project, retrieve the project number, the project name, and the number of employees who work on that project.
26. Change the location and controlling department number for all projects having more than 5 employees to 'Bellaire' and 6 respectively.
27. For each department having more than 10 employees, retrieve the department no, no of employees drawing more than 40,000 as salary.
28. Insert a record in Project table which violates referential integrity constraint with respect to Department number. Now remove the violation by making necessary insertion in the Department table.
29. Delete all dependents of employee whose ssn is '123456789'.
30. Delete an employee from Employee table with ssn = '12345' (make sure that this employee has some dependents, is working on some project, is a manager of some department and is supervising some employees). Check and display the cascading effect on Dependent and Works on table. In Department table MGRSSN should be set to default value and in Employee table SUPERSSN should be set to NULL
31. Perform a query using alter command to drop/add field and a constraint in Employee table.

VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER III
CORE COURSE – VII
VISUAL BASIC .NET PROGRAMMING

L T P C
4 0 0 4

OBJECTIVE:

At the end of this course the learner is expected:

1. To gain in-depth knowledge on .NET frame work
2. To develop business applications using VB .net
3. To understand ADO .Net for database programming.

UNIT - I

(12)

.NET FRAMEWORK AND VB.NET: Evolution of the .NET Framework – Overview of the .NET Framework – VB.NET – Simple VB.Net Program. VARIABLES, CONSTANTS AND EXPRESSIONS: Value Types and Reference Types – Variable Declarations and Initializations – Value Data Types – Reference Data Types – Boxing and Unboxing – Arithmetic Operators – Textbox Control – Label Control – Button Control.

UNIT – II

(12)

CONTROL STATEMENTS: If Statements – Radio Button Control – Check Box Control – Group Box Control – Listbox Control – Checked List Box Control – Combo box Control – Select Case Statement – While Statement – Do Statement – For Statement. METHODS AND ARRAYS: Types of Methods – One Dimensional Array – Multi Dimensional Arrays – Jagged Arrays. CLASSES: Definition And Usage of a Class – Constructor Overloading – Copy Constructor – Instance and Shared Class Members – Shared Constructors.

UNIT – III

(12)

INHERITANCE AND POLYMORPHISM: Virtual Methods – Abstract Class and Abstract Methods – Sealed Classes. INTERFACES, NAMESPACES AND COMPONENTS: Definition of Interfaces – Multiple Implementations of Interfaces – Interface Inheritance – Namespaces – Components – Access Modifiers. DELEGATES, EVENTS AND ATTRIBUTES: Delegates – Events – Attributes – Reflection.

UNIT - IV

(12)

EXCEPTION HANDLING: Default Exception Handling Mechanism – User Defined Exception Handling Mechanism – Throw Statement – Custom Exception. MULTITHREADING: Usage Of Threads – Thread Class – Start(), Abort(), Join(), and Sleep() Methods – Suspend() And Resume() Methods – Thread Priority – Synchronization. I/O STREAMS: Binary Data Files – Text Files - Data Files – FileInfo and DirectoryInfo Classes.

UNIT - V

(12)

ADDITIONAL CONTROLS: Timer – ProgressBar – LinkLabel – Panel – TreeView – Splitter – Menu – SDI & MDI – Dialog Boxes – Toolbar – StatusBar. DATABASE CONNECTIVITY: Advantages Of ADO.NET – Managed Data Providers – Developing a Simple ADO.NET Based Application – Creation

of Data Table – Retrieving Data From Tables – Table Updating – Disconnected Data Access Through Dataset Objects.

Total Hours: 60

TEXT BOOK

1. Muthu C. (2008), "*Visual Basic.NET*", 2nd Ed., Vijay Nicole Imprints Pvt.Ltd.,.

REFERENCES

1. Jeffrey R.Shaprio (2002), "*Visual Basic .NET The Complete Reference*", Mac Graw Hill
2. Michael Halvorson (2010), "*Visual Basic 2010 Step by Step*", Microsoft Press.
3. Harold Davis (2002), "*Visual Basic.NET Programming*", Sybex.

VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER III
CORE COURSE – VII
VISUAL BASIC .NET PROGRAMMING LAB

L T P C
0 0 4 2

1. Create and Validate Login Form.
2. Program to design an 'ACCOUNT' Class.
3. Program to demonstrate Inheritance, Polymorphism and Interfaces.
4. Advance Controls.
5. Common Dialog Controls.
6. ADO.NET Code to show records in DataGridView Control.
7. ADO.NET Code to perform Insert, Delete, Update and Select operations.
8. Crystal Reports

VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER IV
CORE COURSE – VIII
PROGRAMMING IN JAVA

L T P C
4 0 0 4

OBJECTIVE:

To improve the programming knowledge in JAVA to create GUI applications and perform event handling functionalities in response to GUI applications

UNIT I: (12)

Introduction to Java: Features of Java, JDK Environment **Object Oriented Programming Concept** Overview of Programming, Paradigm, Classes, Abstraction, Encapsulation, Inheritance, Polymorphism, Difference between C++ and JAVA **.Java Programming Fundamental :**Structure of java program, Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch), Looping(for, while) ,Type Casting

UNIT II (12)

Classes and Objects: Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes

UNIT III (12)

Arrays and Strings: Arrays, Creating an array, Types of Arrays, String class Methods, String Buffer methods. **Abstract Class, Interface and Packages:** Modifiers and Access Control, Abstract classes and methods, Interfaces, Packages Concept, Creating user defined packages

UNIT IV (12)

Exception Handling: Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions.

UNIT V (12)

File Handling: Byte Stream, Character Stream, File IO Basics, File Operations, Creating file, Reading file, Writing File **.Applet Programming:** Introduction, Types Applet, Applet Life cycle, Creating Applet, Applet tag

Total Hours: 60

TEXT BOOK

1. E Balagurusamy , Programming with JAVA, TMH, 2007

REFERENCES

1. Ivan Bayross, Web Enabled Commercial Application Development Using Html, Dhtml, javascript, Perl Cgi , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3rd Edition., 2009
3. Herbert Schildt , Java 7, The Complete Reference, , 8th Edition, 2009.

VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER IV
CORE COURSE – VIII
PROGRAMMING IN JAVA LAB

L T P C

0 0 4 2

1. WAP to find the largest of n natural numbers.
2. WAP to find whether a given number is prime or not.
3. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.
4. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.
5. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.
6. Write java program for the following matrix operations:
 - i Addition of two matrices
 - ii Summation of two matrices
 - iii Transpose of a matrix
 - iv Input the elements of matrices from user.
7. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.
8. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.
9. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.
10. Write a java program to draw a line between two coordinates in a window.
11. Write a java program to display the following graphics in an applet window.
 - i Circles
 - ii Ellipses
 - iii Arcs
 - iv Polygons
 - v Rectangles
12. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage() prints the information about the error occurring causes.
13. Write a program for the following string operations:
 - i Compare two strings
 - ii Concatenate two strings
 - iii Compute length of a string

14. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.

VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER IV
CORE COURSE – IX
OPERATING SYSTEM

L T P C

4 0 0 4

OBJECTIVE:

To provide an introduction to the internal operation of modern operating systems.

UNIT-I **(12)**

Introduction: System Software, Resource Abstraction, OS strategies. **Types of operating systems** - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, Process Control & Real Time Systems.

UNIT-II **(12)**

Operating System Organization: Factors in operating system design, basic OS functions, implementation consideration; process modes, methods of requesting system services – system calls and system programs.

UNIT-III **(12)**

Process Management : System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model **Scheduling:** Scheduling Mechanisms, Strategy selection, non-pre-emptive and pre-emptive strategies.

UNIT-IV **(12)**

Memory Management: Mapping address space to memory space, memory allocation strategies, fixed partition, variable partition, paging, virtual memory

UNIT-V **(12)**

Shell introduction and Shell Scripting :

Shell and various type of shell, Various editors present in linux, Different modes of operation in vi editor, shell script, Writing and executing the shell script, Shell variable (user defined and system variables), System calls, Using system call , Pipes and Filters, Decision making in Shell Scripts (If else, switch), Loops in shell Functions Utility programs (cut, paste, join, tr , uniq utilities), Pattern matching utility (grep)

Total Hours: 60

TEXT BOOK

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008.

REFERENCES

1. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007.
2. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education 1997. th
3. W. Stallings, Operating Systems, Internals & Design Principles, 5 Edition, Prentice Hall of India. 2008.
4. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.

VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER IV
CORE COURSE – IX
OPERATING SYSTEM LAB

L T P C
0 0 4 2

Note: Following exercises can be performed using Linux or Unix

1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.
2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.
3. Usage of following commands: chmod, grep, tput (clear, highlight), bc.
4. Write a shell script to check if the number entered at the command line is prime or not.
5. Write a shell script to modify “cal” command to display calendars of the specified months.
6. Write a shell script to modify “cal” command to display calendars of the specified range of months.
7. Write a shell script to accept a login name. If not a valid login name display message – “Entered login name is invalid”.
8. Write a shell script to display date in the mm/dd/yy format.
9. Write a shell script to display on the screen sorted output of “who” command along with the total number of users .
10. Write a shell script to display the multiplication table any number,
11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.
12. Write a shell script to find the sum of digits of a given number.
13. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.
14. Write a shell script to find the LCD(least common divisor) of two numbers.
15. Write a shell script to perform the tasks of basic calculator.
16. Write a shell script to find the power of a given number.

17. Write a shell script to find the factorial of a given number.
18. Write a shell script to check whether the number is Armstrong or not.
19. Write a shell script to check whether the file have all the permissions or not.
20. Program to show the pyramid of special character “*”.

**VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER IV
CORE COURSE – X
SOFTWARE ENGINEERING**

L T P C

4 0 0 4

OBJECTIVE:

To assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

UNIT-I

(12)

Software Process: Introduction ,S/W Engineering Paradigm , life cycle models (water fall, incremental, spiral, evolutionary, prototyping, object oriented) , System engineering, computer based system, verification, validation, life cycle process, development process, system engineering hierarchy.

UNIT-II

(12)

Software requirements: Functional and non-functional , user, system, requirement engineering process, feasibility studies, requirements, elicitation, validation and management, software prototyping, prototyping in the software process, rapid prototyping techniques, user interface prototyping, S/W document. Analysis and modeling, data, functional and behavioral models, structured analysis and data dictionary.

UNIT-III

(12)

Design Concepts and Principles: Design process and concepts, modular design, design heuristic, design model and document, Architectural design, software architecture, data design, architectural design, transform and transaction mapping, user interface design, user interface design principles. Real time systems, Real time software design, system design, real time executives, data acquisition system, monitoring and control system.

UNIT-IV

(12)

Software Configuration Management: The SCM process, Version control, Change control, Configuration audit, SCM standards. **Software Project Management:** Measures and measurements, S/W complexity and science measure, size measure, data and logic structure measure, information flow measure. Estimations for Software Projects, Empirical Estimation Models, Project Scheduling.

UNIT-V

(12)

Testing: Taxonomy of software testing, levels, test activities, types of s/w test, black box testing testing boundary conditions, structural testing, test coverage criteria based on data flow, mechanisms, regression testing, testing in the large. S/W testing strategies, strategic approach and issues, unit testing, integration testing, validation testing, system testing and debugging.

Total Hours: 60

Books Recommended:

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill
2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
4. James F Peters and WitoldPedryez, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.
5. Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxfor University Press, New Delhi, 1996.
6. Pfleeger, "Software Engineering", Pearson Education India, New Delhi, 1999.
Carlo Ghezzi, Mehdi Jazayari and Dino Mandrioli, "Fundamentals of Software Engineering", Prentice Hall of India, New Delhi, 1991.

VINAYAKA MISSIONS RESEARCH FOUNDATION
SECOND YEAR B.Sc. Computer Science
SEMESTER IV
CORE COURSE – X
SOFTWARE ENGINEERING LAB

L T P C

0 0 4 2

1. Practical Title

- Problem Statement,
- Process Model

2. Requirement Analysis

- Creating a Data Flow
- Data Dictionary,
- Use Cases

3. Project Management

- Computing FP
- Effort
- Schedule, Risk Table, Timeline chart

4. Design Engineering

- Architectural Design
- Data Design, Component Level Design

5. Testing

- Basis Path Testing Sample Projects
- DTC Route Information: Online information about the bus routes and their frequency and fares
- Car Pooling: To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
- Patient Appointment and Prescription Management System
- Organized Retail Shopping Management Software
- Parking Allocation System

- Wholesale Management System

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE I

1. SOFTWARE TESTING

L T P C
4 0 0 4

OBJECTIVES

1. To understand the Software Testing Concepts.
2. To implement the Software Quality and Control Concepts
3. To Design the Test cases and to get familiarity over Automated Testing tools

UNIT I - INTRODUCTION TO SOFTWARE TESTING

(12 Hours)

Introduction to software testing-The Psychology of Testing-The Economics of Testing -Software Testing Principles-Inspections and Walkthroughs-Code Inspections -An Error checklist for Inspections-White-box testing-Error guessing

UNIT II - MODULE (UNIT) TESTING, HIGHER- ORDER TESTING & DEBUGGING

(12 Hours)

Test-Case Design - 1 -Test-Case Design – 2-Incremental Testing-Top-down versus Bottom- up Testing-Function Testing- System Testing -Acceptance Testing-Installation Testing-Debugging.

UNIT III -THE REALITIES OF SOFTWARE TESTING & TESTING THE SOFTWARE

(12 Hours)

SDLC Models -STLC Model -Software Testing Terms and Definitions-Testing Fundamentals-Dynamic Black-Box Testing – 1-Dynamic Black-Box Testing – 2-Equivalence Partitioning-Data Testing-State Testing.

UNIT IV - APPLYING TESTING SKILLS

(12 Hours)

Configuration Testing -Compatibility Testing-Usability Testing-Testing the Documentation-Testing the Documentation – 2-Web Site Testing – 1-Web Site Testing – 2-Testing for Software Security

UNIT V - AUTOMATED TESTING AND TEST TOOLS & BUG REPORTING (12 Hours)

Automated Testing and Test Tools: -benefits-Test Tools-Software Test Automation-Bug Bashes and Beta Testing-Writing and Tracking

TOTAL HOURS : 60

TEXT BOOKS

1. Glenford J. Myers,(2008), “The Art of Software Testing”, Second Edition,John Wiley & Sons, New Delhi. (UNIT I –III)
2. Ron Patton, (2007) , “Software Testing”, Second Edition, SAMS Techmedia

REFERENCE BOOKS

1. William E.Perry, (2000), “Effective Methods for Software Testing”, Second edition, John Wiley & Sons, New Delhi.
2. Boris Beizer, (1995), “Black-Box Testing: -Techniques for Functional Testing of Software and Systems”, Second edition, John Wiley & Sons, New Delhi.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE I

1. SOFTWARE TESTING LAB

L T P C
0 0 4 2

1. Write a program that take three inputs (a,b&c) that represent the sides of a triangle, and the output is one of the below four:
 - a. Not a triangle
 - b. Scalene triangle
 - c. Isosceles triangle
 - d. Equilateral triangle
 - 1.1 Generate test cases using Boundary Value Analysis, Equivalence Class Partitioning and Decision Table Testing.
 - 1.2 Generate test cases using Basis path testing.
 - 1.3 Run code coverage tool.
2. Write a program that determines the nature of roots of a quadratic equation. Output should be one of the following:-
 - Not a quadratic equation.
 - Complex roots
 - Real roots
 - Single roots
 - 2.1 Generate test cases using Boundary Value Analysis, Equivalence Class Partitioning and Decision Table Testing.
 - 2.2 Generate test cases using Basis path testing.
 - 2.3 Run code coverage tool
3. Write a program that checks whether the number is even or odd. Run code coverage tool and find the amount of code being covered.
4. Write a program that dynamically allocates memory to 10 integers using malloc() or calloc() and
 - do not free memory leading to memory leaks. Verify the same using Valgrind.

- Now, free memory using free() at the end of the program to avoid memory leaks. Verify the same using Valgrind.
5. Use LoadUI load testing tool to test the web application performance.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE I

2. INTERNET TECHNOLOGIES

L T P C
4 0 0 4

OBJECTIVES

- To acquaint the students with the basics of internet technologies

UNIT I

(12 hours)

Introduction to Web Design: Introduction to hypertext markup language (html) document type definition, creating web pages, graphical elements, lists, hyperlinks, tables, web forms, inserting images, frames.

Customized Features: Cascading style sheets, (css) for text formatting and other manipulations.

UNIT II

(10 hours)

JavaScript: Data types, operators, functions, control structures, events and event handling.

UNIT III

(12 hours)

Java: Use of Objects, Array and Array List class, Designing classes, Inheritance, Input/Output, Exception Handling.

UNIT IV

(10 hours)

JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects.

UNIT V

(16 hours)

JSP: Introduction to JavaServer Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values. Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

TOTAL HOURS : 60

Books Recommended:

1. Web Enabled Commercial Application Development Using Html, Dhtml, javascript, Perl CgiBy Ivan Bayross, BPB Publications, 2009.
2. BIG Java Cay Horstmann, Wiley Publication , 3rd Edition., 2009
3. Java 7 ,The Complete Reference, Herbert Schildt, 8th Edition, 2009.

4. The Complete Reference J2EE, TMH, Jim Keogh, 2002.
5. Java Server Pages, Hans Bergsten, Third Edition, O'Reilly Media December 2003.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE I

2. INTERNET TECHNOLOGIES LAB

L T P C
0 0 4 2

JAVA Script

1. Create a student registration form. Create functions to perform the following checks:
 - a. Roll number is a 7-digit numeric value
 - b. Name should be an alphabetical value(String)
 - c. Non-empty fields like DOB
2. Implement a static password protection.
3. Write a java script
 - a. To change the colour of text using SetTimeout()
 - b. To move an image across screen using SetInterval()

JAVA Programs

1. WAP to find the largest of n natural numbers.
2. WAP to find whether a given number is prime or not.
3. WAP to print the sum and product of digits of an Integer and reverse the Integer.
4. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.
5. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.

JDBC

1. Create a table 'Student' and 'Teacher' in 'College' database and insert two rows in this newly created table using JDBC API and do the following:
 - a. Update an already created table 'Teacher' in 'College' database by updating a teacher's name, with "Dr." appended before the name, whose name is "Rita".
 - b. Repeat the same thing for all the teachers using PreparedStatement.
 - c. Delete the student with ID=3 from 'Student' database.

- d. Insert two students to the ResultSet returned by the query which selects all students with FirstName="Ayush". The database must also get updated along with ResultSet.
2. Create a procedure in MySQL to count the number of Rows in table 'Student'. Use Callable Statement to call this method from Java code.

JSP Practical list

1. Display the pattern:

```
1
1 2
1 2 3
```

Take 'n' in a textbox from user. Display this pattern using

- Scriptlets
- `<c:forEach>` loop

2. Make two files as follows:

- a. main.html: shows 2 text boxes and 3 radio buttons with values "addition", "subtraction" and "multiplication"
- b. operate.jsp: depending on what the user selects perform the corresponding function (Give two implementations: using request.getParameter() and using expression language)

3. Validate User input entered in a form. The input must include Name, DOB, Email ID, Lucky Number, Favorite food etc. (Refer Chapter 8)

4. Display Good Morning <uname>, Good Afternoon <uname> or Good Evening <uname> based on the current time of the day.

5. Create your custom library which contains two tags: <hello>, <choco>.

Usage of the tags:

- `<hello name="Ajay">`: Output should be Hello Ajay. It contains a mandatory attribute 'name' which can accept Dynamic value.
- `<choco texture="Chewy">`: Output should be FiveStar, BarOne.
`<choco texture="Crunchy">`: Output should be Munch. KitKat.

That means the mandatory attribute must accept a value, and based on the attributes value, it should give output. You must use a bean ChocoBean for this purpose.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE I

3. COMPILER DESIGN

L T P C
4 0 0 4

OBJECTIVES

At the end of this course, the learner is expected :

1. To Understand the concept of system software
2. To Understand the concept of working of compiler
3. To do Efficient in authoring tools ,processing.

UNIT – I

(12 hours)

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools - Lexical Analysis - Role of Lexical Analyzer – Input Buffering – Specification of Tokens.

UNIT - II

(12 hours)

Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing Recursive Descent Parsing - Predictive Parsing – Bottom-up parsing - Shift Reduce Parsing – Operator Precedent Parsing .

UNIT – III

(12 hours)

Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.

UNIT – IV

(12 hours)

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT – V

(12 hours)

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

TOTAL HOURS: 60

TEXT BOOK

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, (2003),“Compilers Principles, Techniques and Tools”, Pearson Education Asia. Unit (I – V)

REFERENCE BOOKS

1. Allen I. Holub, (2003), "Compiler Design in C", Prentice Hall of India.
2. Fischer.C.N and LeBlanc.R.J,(2003), "Crafting a compiler with C", Benjamin Cummings.
3. Bennet.J.P,(2003), "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE I

3. COMPILER DESIGN LAB

L T P C

0 0 4 2

1. Implementation of LEXICAL ANALYZER for IF STATEMENT
2. Implementation of LEXICAL ANALYZER for ARITHMETIC EXPRESSION
3. Construction of NFA from REGULAR EXPRESSION
4. Construction of DFA from NFA
5. Implementation of SHIFT REDUCE PARSING ALGORITHM
6. Implementation of OPERATOR PRECEDENCE PARSER
7. Implementation of RECURSIVE DESCENT PARSER
8. Implementation of CODE OPTIMIZATION TECHNIQUES
9. Implementation of CODE GENERATOR

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE II

1. MOBILE APPLICATION

L T P C
4 0 0 4

OBJECTIVES

- Describe those aspects of mobile programming that make it unique from programming for other platforms,
- Critique mobile applications on their design pros and cons,
- Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces

UNIT I

(12 hours)

Event Driven Programming: UI event loop, Threading for background tasks, Outlets / actions, delegation, notification, Model View Controller (MVC) design pattern.

Mobile application issues: limited resources (memory, display, network, file system), input / output (multi-touch and gestures), sensors (camera, compass, accelerometer, GPS)

UNIT II

(12 hours)

Development tools: Apple iOS toolchain: Objective-C, Xcode IDE, Interface Builder, Device simulator.

Frameworks: Objective-C and Foundation Frameworks, Cocoa Touch, UIKit, Others: Core Graphics, Core Animation, Core Location and Maps, Basic Interaction.

UNIT III

(14 hours)

Common UI's for mobile devices: Navigation Controllers, Tab Bars, Table Views, Modal views, UI Layout.

Data Persistence: Maintaining state between application invocations, File system, Property Lists, SQLite, Core Data

UNIT IV

(12 hours)

Remote Data-Storage and Communication: "Back End" / server side of application, RESTful programming, HTTP get, post, put, delete, database design, server side JavaScript / JSON (8L)

UNIT V

(10 hours)

Code signing: security, Keychain, Developers and App Store License Agreement

TOTAL HOURS : 60

TEXT BOOK

1. Rajiv Ramnath, Roger Crawfis, and Paolo Sivilotti, Android SDK 3 for Dummies, Wiley, 2011.

2. Brian Fling, Mobile Design and Development, O'Reilly Media, 2009. Maximiliano

REFERENCE BOOKS

1. Valentino Lee, Heather Schneider, and Robbie Schell, Mobile Applications: Architecture, Design, and Development, Prentice Hall, 2004.
2. Brian Fling, Mobile Design and Development, O'Reilly Media, 2009. Maximiliano
3. Firtman, Programming the Mobile Web, O'Reilly Media, 2010.
4. Christian Crumlish and Erin Malone, Designing Social Interfaces, O'Reilly Media, 2009.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE II

1. MOBILE APPLICATION LAB

L T P C
0 0 4 2

1. Installing Android Environment
2. Create Hello World Application
3. Sample Application about Android Resources
4. Sample Application about Layouts
5. Sample Application about Intents
6. Sample Application I about user interfaces
7. Sample Application about Animations
8. Make a Project based on above labs
9. Sample Application about Android Data
10. Sample Application about SQLite I
11. Sample Application about SQLite II
12. Project Presentation

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE II

2. SCRIPTING LANGUAGES

L T P C
4 0 0 4

Objective:

1. To classify the various Scripting Languages
2. To understand DOM and XML
3. To create a webpage

UNIT I -INTRODUCTION TO HTML (12 Hours)

Introduction to HTML: Internet basics -formatting text in HTML-lists-Adding graphics to HTML-Internal and external linking in HTML-frames and framesets-creating tables.

UNIT II -HTML FORMSAND CSS (12 Hours)

HTML forms -Cascading Style Sheet: HTML CSS-Inline styles-creating style sheets with the style elements-Building a web page

UNIT III -DOM AND INTRODUCTION TO JAVA SCRIPT (12 Hours)

DOM model: Understanding DOM model. Objects in HTML, Browser, object, window, history, location, navigator, document object. Java Script: Introduction to scripting-operators: logical-Increment and decrement operators-control structures.

UNIT IV -FUNCTIONS, ARRAYS AND OBJECTS (12 Hours)

Functions: Definition-scope rules-recursion-Arrays: Declaring arrays-passing array to function-sorting arrays-object: math object-string object-data object-boolean object and number object, Handling event using java script.

UNIT V -INTRODUCTION TO XML (12 Hours)

XML-XML overview-features-HTML XML-processing instructions-application of XML-COMMENTS-XML names space –schema-Document Type Definition (DTD) –Extensible style language(XSL).

TOTAL HOURS : 60

TEXT BOOKS

1. Ivan Bayross,(2005),“web enables commercial application development using HTML, DHTML java script, perl CGI”, BPB Publications, New Delhi. UNIT (I –III).
- 2.Deitel.H.M, Nieto.T.R,(2012),“Internet and world wide web How to program”, Fifth Edition, Prentice Hall of Indian Pvt, Ltd, New Delhi. (UNIT IV-V)

REFERENCE BOOK

1. Williamson, (2001), "Xml: The Complete Reference", Tata McGraw-Hill Education.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE II

2.SCRIPTING LANGUAGES LAB

L T P C
0 0 4 2

1. Create Application form using various text formats.
2. Create SRM UNIVERSITY website using HTML tags.
3. Create a table using HTML.
4. Display your information using form controls.
5. Create style sheets with the style elements.
6. Create calculator format using java script.
7. Create an array of 10 numbers and sort them using javascript.
8. String manipulation using string object.
9. Add a simple script using Click event.
10. Create Employee details using schemas.
11. Create our department details using CSS.
12. Create Payroll system using XSL.
13. Changing image using mouseover event.
14. Create a website for a newspaper.
15. Design and apply your application form for course enrolment using javascript.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE II

3. INFORMATION SECURITY

L T P C
4 0 0 4

OBJECTIVES:

- Understand information security's importance in our increasingly computer-driven world.
- Master the key concepts of information security and how they "work."

UNIT I INTRODUCTION

(12 hours)

History, What is Information Security?, Critical Characteristics of Information, NISTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II SECURITY INVESTIGATION

(12 hours)

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III SECURITY ANALYSIS

(12 hours)

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV LOGICAL DESIGN

(12 hours)

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V PHYSICAL DESIGN

(12 hours)

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

TOTAL HOURS: 60

TEXT BOOK:

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003

REFERENCE BOOKS

1. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart Mc Clure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
3. Matt Bishop, "Computer Security Art and Science", Pearson/PHI, 2002.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE II

3. INFORMATION SECURITY LAB

L	T	P	C
0	0	4	2

- 1. Implement the following SUBSTITUTION & TRANSPOSITION TECHNIQUES concepts:**
 - a) Caesar Cipher
 - b) Playfair Cipher
 - c) Hill Cipher
 - d) Vigenere Cipher
 - e) Rail fence – row & Column Transformation
- 2. Implement the following algorithms**
 - a) DES
 - b) RSA Algorithm
 - c) Diffiee-Hellman
 - d) MD5
 - e) SHA-1
- 3. Implement the Signature Scheme - Digital Signature Standard**
- 4. Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG)**
- 5. Setup a honey pot and monitor the honeypot on network (KF Sensor)**
- 6. Installation of rootkits and study about the variety of options**
- 7. Perform wireless audit on an access point or a router and decrypt WEP and WPA. (Net Stumbler)**
- 8. Demonstrate intrusion detection system (ids) using any tool (snort or any other s/w)**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE III

1. DATA MINING

L T P C
4 0 0 4

OBJECTIVE:

To develop an understanding of the strengths and limitations of popular data mining techniques and to be able to identify promising business applications of data mining.

UNIT I

(12 hours)

Data Warehousing: Introduction- Definition and description, need for data ware housing, need for strategic information, failures of past decision support systems, OLTP vs DWH-DWH requirements-trends in DWH-Application of DWH.

UNIT II

(12 hours)

Data Warehousing Architecture: Reference architecture- Components of reference architecture - Data warehouse building blocks, implementation, physical design process and DWH deployment process. A Multidimensional Data, Model Data Warehouse Architecture.

UNIT III

(14 hours)

Data Mining: Data mining tasks-Data mining vs KDD- Issues in data mining, Data Mining metrics, Data mining architecture - Data cleaning- Data transformation- Data reduction - Data mining primitives.

Association Rule Mining: Introduction - Mining single dimensional Boolean association rules from transactional databases - Mining multi-dimensional association rules.

UNIT IV

(12 hours)

Classification and Prediction: Classification Techniques - Issues regarding classification and prediction - decision tree - Bayesian classification –Classifier accuracy – Clustering – Clustering Methods - Outlier analysis.

UNIT V

(10 hours)

Applications and Other Data Mining Methods: Distributed and parallel Data Mining Algorithms, Text mining- Web mining.

TOTAL HOURS : 60

TEXT BOOK:

1. Jiawei Han and Micheline Kamber, " Data Mining Concepts and Techniques", Morgan Kaufmann Publishers, USA, 2006.
2. Berson,"Data Warehousing, Data Mining and OLAP", Tata McGraw Hill Ltd, New Delhi, 2004.

REFERENCE BOOKS

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, ,Pearson Education.
2. Arun K Pujari,"Data mining techniques", Oxford University Press, London, 2003.
3. Dunham M H,"Data mining: Introductory and Advanced Topics". Pearson Education, New Delhi, 2003.
4. Mehmed Kantardzic," Data Mining Concepts, Methods and Algorithms", John Wiley and Sons, USA, 2003.
5. Soman K. P., DiwakarShyam, Ajay V., Insight into Data mining: Theory and Practice, PHI 2006

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE III

1. DATA MINING LAB

L T P C
0 0 4 2

Practical List: Practical are to be done using Weka, and a report prepared as per the format*. The operations are to be performed on built-in dummy data sets of weka and/or the downloadable datasets mentioned in references below. Also wherever applicable, the parameter values are to be varied (upto 3 distinct values). The 'Visualize' tab is to be explored with each operation.

1.Preprocessing : Apply the following filters –

a. weka>filter>supervised>attributed>

AddClassification ,AttributeSelection, Discretize , NominalToBinary

b. weka>filter>supervised>instance:

StratifiedRemoveFolds, Resample

c. weka>filter>unsupervised>attribute>

Add, AddExpression, AddNoise , Center , Discretize , MathExpression ,

MergeTwoValues ,NominalToBinary , NominalToString, Normalize

NumericToBinary ,NumericToNominal , NumericTransform ,

PrincipalComponent , RandomSubset , Remove , RemoveType ,

ReplaceMissingValues , Standardize

d. weka>filter>unsupervised>instance>

Normalize , Randomize , Standardize, RemoveFrequentValues,

RemoveWithValues , Resample , SubsetByExpression

2. Explore the 'select attribute' as follows

weka>attributeSelection> , FilteredSubsetEval ,

WrapperSubsetEval

3. Association mining weka>associations> , Apriori, FPGrowth

4. Classification**

weka>classifiers>bayes> , NaïveBayes , weka>classifiers>lazy> : IB1 ,

IBkweka>classifiers>trees , SimpleCart , RandomTree , ID3

5. Clustering**

weka>clusters> , SimpleKMeans , FarthestFirst algorithm, DBSCAN, hierarchicalClusterer

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE III

2. BUILDING INTERNET OF THINGS

L T P C

4 0 0 4

Objective: To Identify, classify and describe different kinds of Internet-connected product concepts.

UNIT I INTRODUCTION TO THE INTERNET OF THINGS 12

Origins – Early Concepts and Products – Current Products and Value Propositions– Architectures and Design Patterns – Analysis of a Full Connected –Object Experience – State of the Art, Challenges and Future Directions.

UNIT II COMPONENTS IN INTERNET OF THINGS 12

Control Units – Sensors – Communication modules – Power Sources – Communication Technologies – RFID – Bluetooth – Zigbee – Wifi – Rflinks – Mobile Internet – Wired Communication

UNIT III PROGRAMMING THE MICROCONTROLLER FOR IOT 12

Basics of Sensors and actuators – Examples and Working principles of Sensors and Actuators – Cloud computing and IOT – Arduino/Equivalent Microcontroller Platform – Setting up the board - Programming for IOT – Reading from Sensors

UNIT IV COMMUNICATION 12

Connecting microcontroller with Mobile Devices – Communication through Bluetooth and USB – Connection with the Internet using Wifi / Ethernet

UNIT V APPLICATIONS 12

Set up cloud environment – Send data from microcontroller to cloud – Case studies – Open Source e-Health sensor platform – BeClose Elderly monitoring – Other recent projects.

TOTAL HOURS:60

TEXT BOOK:

1. Charalampos Doukas , "Building Internet of Things with the Arduino", Create space, April 2002

REFERENCE BOOK:

1. Vijay Madiseti and Arshdeep Bahga, “**Internet of Things (A Hands-on-Approach)**”, 1st Edition, VPT, 2014
2. Francis daCosta, “**Rethinking the Internet of Things: A Scalable Approach to Connecting Everything**”, 1st Edition, Apress Publications, 2013
3. Cuno Pfister, Getting Started with the Internet of Things, O’Reilly Media, 2011, ISBN: 978-1-4493-9357-1
4. <http://postscapes.com/>
5. <http://www.theinternetofthings.eu/what-is-the-internet-of-things>

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE III

2. BUILDING INTERNET OF THINGS LAB

L T P C

0 0 4 2

1. Creating a Bluemix Application
2. Create and add an Internet of Things Service
3. Wire the connected device's data flow with IBM Node-RED

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE III

3. CLOUD COMPUTING

L T P C

4 0 0 4

Objective:

- To classify the various Cloud computing applications
- To build an architecture of Cloud computing IVES
- To understand Cloud computing standards

UNIT I:

12 Hours

Cloud Introduction: Cloud Computing Fundamentals: Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing , usage scenarios and Applications , Business models around Cloud – Major Players in Cloud Computing - Issues in Cloud - Eucalyptus - Nimbus - Open Nebula, CloudSim.

UNIT II:

12 Hours

Cloud Services And File System: Types of Cloud services: Software as a Service - Platform as a Service – Infrastructure as a Service - Database as a Service - Monitoring as a Service – Communication as services. Service providers- Google App Engine, Amazon EC2, Microsoft Azure, Sales force. Introduction to MapReduce, GFS, HDFS, Hadoop Framework.

UNIT III:

12 Hours

Collaborating With Cloud:Collaborating on Calendars, Schedules and Task Management – Collaborating on Event Management, Contact Management, Project Management – Collaborating on Word Processing , Databases – Storing and Sharing Files- Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Collaborating via Social Networks – Collaborating via Blogs and Wikis. 185 CS-Engg&Tech-SRM-2013

UNIT IV:

12 Hours

Virtualization For Cloud :Need for Virtualization – Pros and cons of Virtualization – Types of Virtualization – System Vm, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - Hypervisors – Xen, KVM , VMWare, Virtual Box, Hyper-V.

UNIT V:

12 Hours

Security, Standards, And Applications: Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud.

TOTAL HOURS: 60

TEXT BOOK:

1. Bloor R., Kanfman M., Halper F. Judith Hurwitz “Cloud Computing ” Wiley India Edition,2010
2. John Rittinghouse& James Ransome, “Cloud Computing Implementation Management and Strategy”, CRC Press, 2010
3. Antohy T Velte ,Cloud Computing : “A Practical Approach”, McGraw Hill,2009
4. Michael Miller, Cloud Computing: “Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing, August 2008.
5. James E Smith, Ravi Nair, “Virtual Machines”, Morgan Kaufmann Publishers, 2006.

REFERENCE BOOKS

1. Haley Beard, “Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing”, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008
2. webpages.iust.ac.ir/hsalimi/.../89.../Cloud%20Common%20standards.ppt ennebula.org,
3. www.cloudbus.org/cloudsim/, <http://www.eucalyptus.com/>
4. hadoop.apache.org

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE III

1. CLOUD COMPUTING LAB

L T P C

0 0 4 2

1. Create virtual machines that access different programs on same platform.
2. Create virtual machines that access different programs on different platforms.
3. Exploring Google cloud for the following
 - a) **Storage**
 - b) **Sharing of data**
 - c) manage your calendar, to-do lists,
 - d) a document editing tool
4. Exploring Microsoft cloud
5. Exploring Amazon cloud

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

DISCIPLINE SPECIFIC ELECTIVE IV

PROJECT WORK Project Work/Dissertation (Compulsory)

L	T	P	C
1	0	8	6

- This option is to be offered only in 6th Semester.
- The students will be allowed to work on any project based on the concepts studied in core/elective or skill based elective courses.
- The group size should be maximum of three (03) students.
- Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes.
- A maximum of Four (04) projects would be assigned to one teacher.
- Theory classes will cover project management techniques.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

SKILL ENHANCEMENT COURSES

1. OFFICE AUTOMATION TOOLS

L T P C
1 0 2 4

OBJECTIVE:

- To make students understand and learn various Office Automation Tools like MS Word, MS Excel & MS PowerPoint.

Introduction to open office/MS office/Libreoffice (2L)

Word Processing: Formatting Text, Pages, Lists, Tables (5L)

Spreadsheets: Worksheets, Formatting data, creating charts and graphs, using formulas and functions, macros, Pivot Table (6L)

Presentation Tools: Adding and formatting text, pictures, graphic objects, including charts, objects, formatting slides, notes, hand-outs, slide shows, using transitions, animations (4L)

Books Recommended:

1. SushilaMadan , Introduction to Essential tools,JBA,2009.
2. Anita Goel, Computer Fundamentals, Pearson, 2012

Computer Lab Based on Office Automation:

Practical List for WORD:

1. Create a **telephone directory**.
 - The heading should be 16-point Arial Font in bold
 - The rest of the document should use 10-point font size
 - Other headings should use 10-point Courier New Font.
 - The footer should show the page number as well as the date last updated.
2. Design a time-table form for your college.

- The first line should mention the name of the college in 16-point Arial Font and should be bold.
- The second line should give the course name/teacher's name and the department in 14point Arial.
- Leave a gap of 12-points.
- The rest of the document should use 10-point Times New Roman font.
- The footer should contain your specifications as the designer and date of creation.

3. Create the following one page documents.

- (a) Compose a note inviting friends to a get-together at your house, including a list of things to bring with them.
- (b) Design a certificate in landscape orientation with a border around the document.

4. Create the following document: A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.

5. Convert following text to a table, using comma as delimiter

Type the following as shown (do not bold). **Color, Style, Item**

Blue, A980, Van

Red, X023, Car

Green, YL724, Truck

Name, Age, Sex

Bob, 23, M

Linda, 46, F

Tom, 29, M

6. Prepare a grocery list having four columns (Serial number, the name of the product, quantity and price) for the month of April, 06.

- Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.
- The headings of the columns should be in 12-point and bold.
- The rest of the document should be in 10-point Times New Roman.
- Leave a gap of 12-points after the title.

7. XYZ Publications plans to release a new book designed as per your syllabus. Design the first page of the book as per the given specifications.

- (a) The title of the book should appear in bold using 20-point Arial font.

- (b) The name of the author and his qualifications should be in the center of the page in 16point Arial font.
 - (c) At the bottom of the document should be the name of the publisher and address in 16point Times New Roman.
 - (d) The details of the offices of the publisher (only location) should appear in the footer.
8. Create the following one page documents.
- a) Design a Garage Sale sign.
 - b) Make a sign outlining your rules for your bedroom at home, using a numbered list.
9. Enter the following data into a table given on the next page.

Salesperson	Dolls	Trucks	Puzzles
Amit	1327	1423	1193
Shivi	1421	3863	2934
Om	5214	3247	5467
Ananya	2190	1278	1928
Anupama	1201	2528	1203
Maharshi	4098	3079	2067

Add a column Region (values: S, N, N, S, S, S) between the Salesperson and Dolls columns to the given table Sort your table data by Region and within Region by Salesperson in ascending order:

Practical List for EXCEL

Q1. Create a student worksheet containing roll numbers, names and total marks.

Open a document in Word and insert the excel worksheet using:-

- i) Copy/Paste
- ii) Embedding
- iii) Linking

Q2. The term wise marks for APS class of 20 students are stored in 3 separate sheets named term1, term2 and term3. Create 4th worksheet that contains student names and their total and average marks for the entire year. Give proper headings using headers. Make the column headings bold and italic. The 4th worksheet should contain college name as the first line. Make it bold, italic and center it.

Q3. Using a simple pendulum, plot 1-T and 1-T² graph.

I	t1	t2	t3	Mean(t)	T=t/20	T
70						
80						
90						
100						

Q4. Consider the following employee worksheet:-

Full Name (First Last)	Grade 1/2/3	Basic Salary	HRA	PF	Gross	Net	(VA) Vehicle Allowance

HRA is calculated as follows:

Grade HRA %(of Basic)

- 1 40%
- 2 35%
- 3 30%

$$\text{Gross} = \text{Basic} + \text{HRA} + \text{VA}$$

$$\text{Net} = \text{Gross} - \text{PF}$$

PF is 8% for all Grades

VA is 15000, 10000 and 7000 for Grades 1, 2 and 3.

- i) Find max, min and average salary of employees in respective Grade
- ii) Count no. of people where VA>HRA
- iii) Find out most frequently occurring grade.
- iv) Extract records where employee name starts with "A" has HRA>10000
- v) Print Grade wise report of all employees with subtotals of net salary and also grand totals. Use subtotal command.
- vi) Extract records where Grade is 1 or 2 and salary is between 10000 and 20000 both inclusive.

Q5. In a meeting of a marketing department of an organization it has been decided that price of selling an item is fixed at Rs40. It was resolved to increase the sell of more of more items and getting the profit of

Rs40,000/.Use Goal Seek of find out how many items you will have to sell to meet your profit figure.

Q6. To study the variation in volume with pressure for a sample of an air at constant temperature by plotting a graph for P – V and P-I/V. Sample observations are:-

Pressure(P)	Volume (V)	I/V	PV	P/V
75	20			
78.9	19			
83.3	18			
88.2	17			

Q7. Plot the chart for marks obtained by the students (out of 5) vs. frequency (total number of students in class is 50).

Q8. Create the following worksheet(s) containing an year wise sale figure of five salesmen in Rs.

Salesman	2002	2003	2004	2005
MOHAN	10000	12000	20000	50000
MITRA	15000	18000	50000	60000
SHIKHA	20000	22000	70000	70000
ROHIT	30000	30000	100000	80000
MANGLA	40000	45000	125000	90000

Apply the following Mathematical & Statistical functions:

- i) Calculate the commission for each salesman under the condition :-
 - a) If total sales is greater than Rs. 3, 00,000/-, then commission is 10% of total sale made by the salesman.
 - b) Otherwise, 4% of total sale.
- ii) Calculate the maximum sale made by each salesman.
- iii) Calculate the maximum sale made in each year.
- iv) Calculate the minimum sale made by each salesman. v) Calculate the minimum sale made in each year.
- vi) Count the no. of sales persons. vii) Calculate the cube of sales made by Mohan in the year 2002.
- viii) Find the difference in sales by salesman Mitra between the year 2002 and 2003. Find the absolute value of difference.

- ix) Also calculate the Mode, Stddev, Variance, Median for the sale made by each salesman.
- ix) Calculate the year wise Correlation coefficient between the sales man Mohan and Mitra year wise

Q9. The following table gives an year wise sale figure of five salesmen in Rs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

- v) Calculate total sale year wise.
- vi) Calculate the net sales made by each salesman
- vii) Calculate the commission for each salesman under the condition :-
 - c) If total sales is greater than Rs. 4, 00,000/-, then commission is 5% of total sale made by the salesman.
 - d) Otherwise, 2% of total sale.
- viii) Calculate the maximum sale made by each salesman.
- ix) Calculate the maximum sale made in each year.
- x) Draw a bar graph representing the sale made by each salesman. xi) Draw a pie graph representing the sale made by salesmen in year 2001.

Q10. Consider the following worksheet for APS 1st year students:-

S.No.	Name	PH	CH	BY	MT	CS	Total Marks	%	Grade
1									
2									

Grade is calculated as follows:-

If % \geq 90 Grade A If % \geq 80 & $<$ 90 Grade B

If % \geq 70 & $<$ 80 Grade C

If % \geq 60 & $<$ 70 Grade D

Otherwise students will be declared fail.

- i) Calculate Grade using if function
- ii) Sort the data according to total marks
- iii) Apply filter to display the marks of the students having more than 65% marks.
- iv) Draw a pie chart showing % marks scored in each subject by the topper of the class.
- v) Draw the doughnut chart of the data as in (iv)
- vi) Enter the S.No. of a student and find out the Grade of the student using VLOOKUP.
- vii) Extract all records where name

- a) Begins with "A"
- b) Contains "A"
- c) Ends with "A"

Practical List for Power Point:

1. Create five Power point slides. Each slide should support different format. In these slides explain areas of applications of IT. Make slide transition time as 10 seconds.
2. Create five Power Point slides to give advantages/disadvantages of computer, application of computers and logical structure of computer.
3. Create five Power Point slides detailing the process of internal assessment. It should be a self-running demo.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

SKILL ENHANCEMENT COURSES

2. HTML Programming

L T P C
1 0 2 4

OBJECTIVE:

To build the fundamental knowledge of application development for the internet using HTML

Unit-I: Introduction (1L)

Unit-II: The Basics (2L)

The Head, the Body Colors, Attributes Lists, ordered and unordered

Unit-III: Links (3L)

Introduction

Relative Links, Absolute Links, Link Attributes. Using the ID Attribute to Link Within a Document

Unit-IV: Images (2L)

Putting an Image on a Page, Using Images as Links, Putting an Image in the Background

Unit V: – Tables (4L)

Creating a Table, Table Headers Captions, Spanning Multiple Columns, Styling Table

Unit VI – Forms (3L)

Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, Where To Go From Here

Book Recommended:

1. Introduction to **HTML** and CSS -- O'Reilly , 2010
2. Jon Duckett, HTML and CSS, John Wiely, 2012

Software Lab Based on HTML:

Q.1 Create an HTML document with the following formatting options:

Bold

Italics

Underline

Headings (Using H1 to H6 heading styles) V. Font (Type, Size and Color)

Background (Colored background/Image in background)

Paragraph
Line Break
Horizontal Rule
Pre tag

Q.2 Create an HTML document which consists of:

I. Ordered List

Unordered List

Nested List

Image

- A. Safety Considerations
 - 1. Body substance isolation
 - 2. Sense safety
 - 3. Initial size-up
- B. Initial Patient Assessment
 - 1. General Impression
 - 2. Unresponsiveness
 - i. Alert to person, place and time
 - ii. Verbal response to audible stimuli
 - iii. Pain evokes verbal or physical response
 - iv. Unresponsive to all stimuli
- C. Patient Critical Needs
 - 1. Airway
 - 2. Breathing
 - i. Use oxygen if indicated
 - ii. Consider use of assisting with bag value mask
 - 3. Circulation
 - 4. Bleeding

Create an HTML document which implements Internal linking as well as External linking.
Create a table using HTML which consists of columns for Roll No., Student's name and grade.

Result		
Roll No.	Name	Grade

Create a Table with the following view:

			Place an image here	

Create a form using HTML which has the following types of controls:

Text Box

Option/radio buttons

- III. Check boxes
- IV. Reset and Submit buttons

Subscribe to XYZ News Magazine and Emails

Interested in receiving daily small updates of all latest News? Well, now you can. And best of all, it is free! Just fill out this form and submit it by clicking the "send it In" button. We will put you on our mailing list and you will receive your first email in 3-5 days.

Please fill the following boxes to help us send the emails and our news letter:

First Name:

Last Name:

Business:

We must have a correct e-mail address to send you the news letter:

Email:

How did you hear about XYZ News Magazine and Emails?

Here on the Web In a magazine Television Other

Would you like to be on our regular mailing list?

Yes, we love junk emails

Q.7 Create HTML documents (having multiple frames) in the following three formats:

Frame1
Frame2

Fra me1	
Frame2	Frame3

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

SKILL ENHANCEMENT COURSES

3. **MySQL (SQL/PL-SQL)**

L T P C
1 0 2 4

OBJECTIVE:

- Establish a basic understanding of the analysis and design of a database
- Enhance Programming and Software Engineering skills and techniques using SQL.

SQL Vs. SQL * Plus:

SQL Commands and Data types, Operators and Expressions, Introduction to SQL * Plus. (2L)

Managing Tables and Data:

- Creating and Altering Tables (Including constraints)
- Data Manipulation Command like Insert, update, delete
- SELECT statement with WHERE, GROUP BY and HAVING, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL BETWEEN, EXISTS, LIKE
- Join, Built in functions (4L)

Other Database Objects

- View
- Synonyms, Index (2L)

Transaction Control Statements

- Commit, Rollback, Savepoint (2L)

Introduction to PL/SQL

- SQL v/s PL/SQL
- PL/SQL Block Structure
- Language construct of PL/SQL (Variables, Basic and Composite Data type, Conditions looping etc.)
- % TYPE and % ROWTYPE
- Using Cursor (Implicit, Explicit) (5L)

Books Recommended:

1. Baron Schwartz , High Performance MySQL, O'Reilly, 2012.
2. VikramVaswani , The Complete Reference MySQL , McGraw Hill Educations, 2004.

Software Lab Based on MySQL (SQL/PL-SQL):

[SQL COMMANDS]

- 1) SQL* formatting commands
- 2) To create a table, alter and drop table.
- 3) To perform select, update, insert and delete operation in a table.
- 4) To make use of different clauses viz where, group by, having, order by, union and intersection,
- 5) To study different constraints.

[SQL FUNCTION]

- 6) To use oracle function viz aggregate, numeric, conversion, string function.
- 7) To understand use and working with joins.
- 8) To make use of transaction control statement viz rollback, commit and save point.
- 9) To make views of a table.
- 10) To make indexes of a table.

[PL/SQL]

- 11) To understand working with PL/SQL
- 12) To implement Cursor on a table.
- 13) To implement trigger on a table

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

SKILL ENHANCEMENT COURSES

4. PHP Programming

L T P C
1 0 2 4

OBJECTIVE:

1. Describe and use the features and syntax of programming language PHP
2. Create, translate, and process HTML information using the Common Gateway Information (CGI) protocol.
3. Retrieve, insert, update, and delete data from the relational database MySQL

Introduction to PHP:

(3L)

- PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.)
- PHP with other technologies, scope of PHP
- Basic Syntax, PHP variables and constants
- Types of data in PHP , Expressions, scopes of a variable (local, global)
- PHP Operators : Arithmetic, Assignment, Relational , Logical operators, Bitwise , ternary and MOD operator.
- PHP operator Precedence and associativity

Handling HTML form with PHP:

(2L)

- Capturing Form Data
- GET and POST form methods
- Dealing with multi value fields
- Redirecting a form after submission

PHP conditional events and Loops: (3L)

- PHP IF Else conditional statements (Nested IF and Else)
- Switch case, while ,For and Do While Loop
Goto , Break ,Continue and exit

PHP Functions:

(3L)

- Function, Need of Function , declaration and calling of a function
- PHP Function with arguments, Default Arguments in Function
- Function argument with call by value, call by reference
 - Scope of Function Global and Local

String Manipulation and Regular Expression: (3L)

- Creating and accessing String , Searching & Replacing String
- Formatting, joining and splitting String , String Related Library functions
- Use and advantage of regular expression over inbuilt function
- Use of preg_match(), preg_replace(), preg_split() functions in regular expression

Array: (3L)

- Anatomy of an Array ,Creating index based and Associative array ,Accessing array
- Looping with Index based array, with associative array using each() and foreach()
- Some useful Library function

Software Lab Based on PHP:

1. Create a PHP page using functions for comparing three integers and print the largest number.
2. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
3. WAP to check whether the given number is prime or not.
4. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
5. Write a PHP function that checks if a string is all lower case.
6. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
7. WAP to sort an array.
8. Write a PHP script that removes the whitespaces from a string.
Sample string : 'The quick " " brown fox'

Expected Output :Thequick""brownfox

9. Write a PHP script that finds out the sum of first n odd numbers.
10. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
11. Write a PHP script that checks if a string contains another string.
12. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.
13. Create a script to construct the following pattern, using nested for loop. *

```
* *
* * *
* * * *
* * * * *
```

14. Write a simple PHP program to check that emails are valid.
 15. WAP to print first n even numbers.
 16. \$color = array('white', 'green', 'red')
Write a PHP script which will display the colors in the following way :
- Output : white, green, red,
- green
 - red
 - white
17. Using switch case and dropdown list display a “Hello” message depending on the language selected in drop down list.
 18. Write a PHP program to print Fibonacci series using recursion.
 19. Write a PHP script to replace the first 'the' of the following string with 'That'.

Sample : 'the quick brown fox jumps over the lazy dog.'

Expected Result : That quick brown fox jumps over the lazy dog.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

SKILL ENHANCEMENT COURSES

5. System Administration and Maintenance

L T P C
1 0 2 4

OBJECTIVE:

To learn deployment and maintenance of modern computer systems in an operational environment.

Part I (Linux/Unix)

(8L)

- Basics of operating system, services,
- Installation and configuration, maintenance
- What is linux/unix Operating systems, Kernel, API, cli, gui,
- Difference between linux/unix and other operating systems
- Features and Architecture
- Linux features, advantages, disadvantages

Part II (Windows)

(8L)

- Windows as operating system, history, versions.
- PC hardware, BIOS, Devices and drivers,
- Kernal Configuration and building
- Application installation, configuration and maintenance
- Server services and Client services
- Difference between WindowsXP/windows7 and windows server 2003/2008

Software Lab Based on System Administration and Maintenance

Linux:

Linux Desktop tour. Configuring desktop environment and desktop settings.

Basic Commands :Terminal, shell,Cat, ls, cd, date, cal, man, echo, pwd, Mkdir, rm, rmdir Ps, kill
--

Package Installation

Synaptic package manager

Windows:

<p>Creating users – Admin and regular.</p> <p>Path of their personal files. Adding and changing passwords.</p> <p>Difference between workgroup and domain. Concept of roles.</p> <p>user profiles – creating and roaming Concept of Active Directory. Creating active directory in windows 2003/2008.</p>
<p>Process and Disk management</p> <p>Windows Task manager. File systems – NTFS, FAT.</p>
<p>Services</p> <p>Control Panel</p> <p>C:/program Files, C:/system C:/windows</p> <p>Add /remove new hardware (like printer), Add/remove new programmes.</p>
<p>Network Administration</p> <p>Ipconfig, Ping, tracert, route, hostname, net, netstat, whoami Set manual IP address, check connectivity – ipv4, ipv6</p>
<p>Administrator Tools</p> <p>Control Panel -> Administrative Tools</p> <p>Computer Management, Local security Policy, Performance Monitor, Task Scheduler, Antivirus and firewall.</p>
<p>Misc</p> <p>Start->Accessories->System tools -> All options (Remote desktop, backup/restore etc.)</p> <p>LAN – sharing printer, files and folder over the network.</p>

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

SKILL ENHANCEMENT COURSES

6. Programming in SCILAB

L T P C
1 0 2 4

OBJECTIVE:

1. To provide students with sound foundation in applied mathematics to solve real life problems in industry.
2. To provide hands on experience in using Scilab software to handle real life problems.

Unit I- Introduction to Programming: Components of a computer, working with numbers, Machine code, Software hierarchy. (2L)

Unit II- Programming Environment: SCILAB Environment, Workspace, Working Directory, Expressions, Constants, Variables and assignment statement, Arrays. (3L)

Unit III- Graph Plots: Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save. (2L)

Unit IV- Matrices and Some Simple Matrix Operations, Sub- Matrices. (2L)

Unit IV- Procedures and Functions: Arguments and return values (2L)

Unit V- Control Statements: Conditional statements: If, Else, Else-if, Repetition statements: While, for loop. (3L)

Unit VI- Manipulating Text: Writing to a text file, Reading from a text file, Randomising and sorting a list, searching a list. (2L)

Recommended Books:

1. M.Affouf, SCILAB by Example ,CreateSpace Independent Publishing Platform,2012
2. H. Ramchandran, A.S. Nair, SCILAB , S.Chand, 2011

Software Lab Based on SCILAB:

1. Write a program to assign the following expressions to a variable A and then to print out the value of A.

a. $(3+4)/(5+6)$

$$\frac{2\pi^2}{\sqrt{2}}$$

b.

c.d. $(0.0000123 + 5.67 \times 10^{-3}) \times 0.4567 \times 10^{-4}$

2. Celsius temperatures can be converted to Fahrenheit by multiplying by 9, dividing by 5, and adding 32. Assign a variable called C the value 37, and implement this formula to assign a variable F the Fahrenheit equivalent of 37 Celsius.
3. Set up a vector called N with five elements having the values: 1, 2, 3, 4, 5. Using N, create assignment statements for a vector X which will result in X having these values:
 - a. 2, 4, 6, 8, 10
 - b. 1/2, 1, 3/2, 2, 5/2
 - c. 1, 1/2, 1/3, 1/4, 1/5
 - d. 1, 1/4, 1/9, 1/16, 1/25
4. A supermarket conveyor belt holds an array of groceries. The price of each product (in pounds) is [0.6, 1.2, 0.5, 1.3]; while the numbers of each product are [3, 2, 1, 5]. Use MATLAB to calculate the total bill.
5. The sortrows(x) function will sort a vector or matrix X into increasing row order. Use this function to sort a list of names into alphabetical order.
6. The “identity” matrix is a square matrix that has ones on the diagonal and zeros elsewhere. You can generate one with the eye() function in MATLAB. Use MATLAB to find a matrix B, such that when multiplied by matrix A=[1 2; -1 0] the identity matrix I=[1 0; 0 1] is generated. That is A*B=I.
7. Create an array of N numbers. Now find a single MATLAB statement that picks out from that array the 1,4,9,16,...,√Nth entries, i.e. those numbers which have indices that are square numbers.
8. Draw a graph that joins the points (0,1), (4,3), (2,0) and (5,-2).
9. The seeds on a sunflower are distributed according to the formula below. Plot a small circle at each of the first 1000 co-ordinates :

$$r_n = \sqrt{n}$$

$$\theta_n = \frac{137.51}{180} \pi n$$

10. Calculate 10 approximate points from the function $y=2x$ by using the formulae:
 - i. $x_n = n$
 - ii. $y_n = 2n + \text{rand} - 0.5$

Fit a line of best fit to these points using the function polyfit() with degree=1, and generate co-ordinates from the line of best fit using polyval(). Use the on-line help to find out how to use these functions. Plot the raw data and the line of best fit.

11. Calculate and replay 1 second of a sinewave at 500Hz with a sampling rate of 11025Hz. Save the sound to a file called "ex35.wav". Plot the first 100 samples.

12. Calculate and replay a 2 second chirp. That is, a sinusoid that steadily increases in frequency with time, from say 250Hz at the start to 1000Hz at the end.
13. Build a square wave by adding together 10 odd harmonics: 1f, 3f, 5f, etc. The amplitude of the nthharmonic should be 1/n. Display a graph of one cycle of the result superimposed on the individual harmonics.
14. Write a function called FtoC (ftoc.m) to convert Fahrenheit temperatures into Celsius. Make sure the program has a title comment and a help page. Test from the command window with:
 - i. FtoC(96)
 - ii. lookfor Fahrenheit
 - iii. help FtoC
15. Write a program to input 2 strings from the user and to print out (i) the concatenation of the two strings with a space between them, (ii) a line of asterisks the same length as the concatenated strings, and (iii) the reversed concatenation. For example:
 - i. Enter string 1: Mark
 - ii. Enter string 2: Huckvale
 - iii. Mark Huckvaleiv.
 - iv. *****
 - v. elavkcuHkraM

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

SKILL ENHANCEMENT COURSES

7. **Android Programming**

L T P C
1 0 2 4

OBJECTIVE:

1. Competence with the fundamental programming paradigms used to write Android applications
2. Competence with applications that permit users to interact with their environment such as location awareness, media or the Internet
3. Proficiency with the tools for creating Android applications

Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture. (2L)

Overview of object oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine. (4L)

Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a android project – Hello Word, run on emulator, Deploy it on USB-connected Android device. (5L)

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes. (2L)

User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, and Dialog. (2L)

Database: Understanding of SQLite database, connecting with the database. (2L)

Book Recommended:

1. Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013.

ONLINE READING / SUPPORTING MATERIAL:

1. <http://www.developer.android.com>

2. <http://developer.android.com/about/versions/index.html>
3. <http://developer.android.com/training/basics/firstapp/index.html>
4. <http://docs.oracle.com/javase/tutorial/index.htm> (Available in the form of free downloadable ebooks also).
5. <http://developer.android.com/guide/components/activities.html>
6. <http://developer.android.com/guide/components/fundamentals.html>
7. <http://developer.android.com/guide/components/intents-filters.html>.
8. <http://developer.android.com/training/multiscreen/screensizes.html>
9. <http://developer.android.com/guide/topics/ui/controls.html>
10. <http://developer.android.com/guide/topics/ui/declaring-layout.html>
11. <http://developer.android.com/training/basics/data-storage/databases.html>

Software Lab Based on Android Programming:

1. Create “Hello World” application. That will display “Hello World” in the middle of the screen in the emulator. Also display “Hello World” in the middle of the screen in the Android Phone.
2. Create an application with login module. (Check username and password).
3. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
4. Create a menu with 5 options and selected option should appear in text box.
5. Create a list of all courses in your college and on selecting a particular course teacher-incharge of that course should appear at the bottom of the screen.
6. Create an application with three option buttons, on selecting a button colour of the screen will change.
7. Create and Login application as above. On successful login, pop up the message.
8. Create an application to Create, Insert, update, Delete and retrieve operation on the database.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

SKILL ENHANCEMENT COURSES

8. XML Programming

L T P C
1 0 2 4

OBJECTIVE:

The student will acquire a knowledge of key features of the most common languages in the XML standard family. The student will fully understand the definition and structure of the Extensible Markup Language (XML), and tree structures in data organisation. Understanding functional programming based on XSLT.

Introduction: Understanding Mark-up Languages, Introduction to XML and its Goals. (3L)

XML Basics: XML Structure and Syntax, Document classes and Rules. (5L)

Other XML Concepts: Scripting XML, XML as Data, Linking with XML. (4L)

XML with Style: XSL –Style Sheet Basics, XSL basics, XSL style sheets. (3L)

Books Recommended

1. William J. Pardi , XML in action web technology, Microsoft Press, 1999
2. Michael J. Young ,Step by Step XML , Microsoft Press, 2002

Software Lab Based on XML:

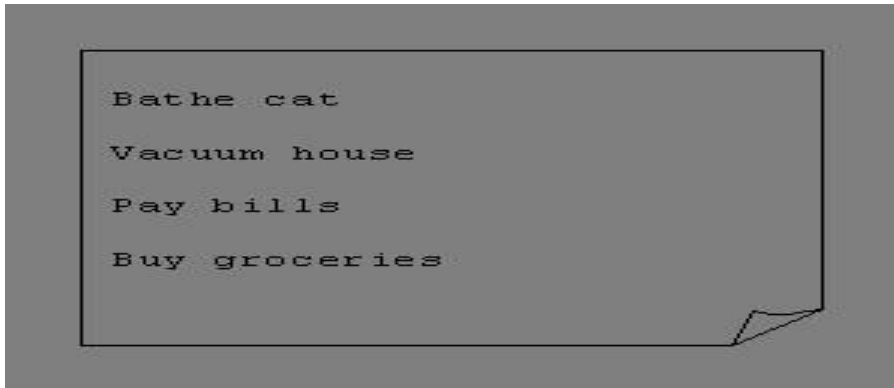
Exercise #1 – Information Structure

In this exercise, student will practice identifying the structure of an information object.

For the sample document provided below:

Label the information structures you see, including containing structures.

12. Draw a tree representation of the structure.



Exercise 2# Deconstructing an XML Document

In this exercise, student will practice identifying the explicit structure within an XML document. In a sense, this is the reverse of what you did in Exercise #1. For the sample XML markup below, create a document-like representation (or a simple drawing) for the content contained within the XML tags:

```
<book>
<coverInfo>
<title>The XML Handbook</title>
<author>Charles F. Goldfarb</author>
<author>Paul Prescod</author>
<edition>Second</edition>
<description>The definitive XML resource: applications, products, and technologies. Revised
and expanded—over 600 new pages.
</description>
</coverInfo>
</book>
```

Exercise #3 – Creating XML Markup

In this exercise, create some XML markup based on the tree representation from Exercise #1 above, and the content from the original sample document.

Exercise #4 – Well-Formedness

This exercise checks your understanding of the constraints for well-formedness. Are the following document instances well-formed? Explain any NO answers.

```
<list><title>The first list</title><item>An item</list>
<item>An item</item><item>Another item</item>
```


<para>Bathing a cat is a <emph>relatively</emph> easy task as long as the cat is willing.</para>

<bibl><title>How to Bathe a Cat</title>Merlin Bauer</bibl>

Exercise #5-Well Formedness

This exercise is a bit more challenging than the previous example. Here is a fragment of an XML document instance. Identify all the places where it fails to match the constraints for wellformedness.

<PROCEDURE><TITLE>How to Bathe a Cat</TITLE>

<OVERVIEW>

This procedure tells you how to bathe a cat. <WARNING></OVERVIEW>Cats don't like to take baths. You could get hurt doing this. Be sure to obtain all the required protective gear before you start. </WARNING><EQUIPEMENT><ITEM>Hockey Mask <ITEM>Padded Full-body Kevlar Armor</ITEM><ITEM>Tub full of warm water</ITEM><ITEM>Towels </ITEM><ITEM>First Aid kit</ITEM><ITEM>Cat Shampoo</ITEM>

<EQUIPMENT><INSTRUCTIONS><STEP> Locate the cat, who by now is hiding under the bed.</STEP><STEP>Place the cat in the tub of water.</STEP><ITEM>Using the First Aid kit, repair the damage to your head and arms.</STEP><STEP>Place the cat back in the tub and hold it down.</STEP><STEP>Wash it really fast, then make an effort to dry it with the towels.</STEP><STEP>Decide not to do this again. </STEP></INSTRUCTIONS>

Note: Cover more exercises based on XML Programming theory concepts.

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.Sc. Computer Science

SKILL ENHANCEMENT COURSES

9. **R Programming**

L T P C
1 0 2 4

OBJECTIVE:

- To give an introduction to the software *R* and how to write elementary programs

Introduction: Overview and History of R, Getting Help, Data types, Subsetting, Vectorized Operations, Reading and Writing Data. **(5L)**

Control Structures, Functions, lapply, tapply, split, mapply, apply, Coding Standards. **(5L)**

Scoping Rules, Debugging Tools, Simulation, R Profiler. **(5L)**

Reference Book

W. N. Venables, D. M. Smith, An Introduction to R, R-core team, 2015

Software Lab Based on R Programming:

1. Write a program that prints 'Hello World' to the screen.
2. Write a program that asks the user for a number *n* and prints the sum of the numbers 1 to *n*
3. Write a program that prints a multiplication table for numbers up to 12.
4. Write a function that returns the largest element in a list.
5. Write a function that computes the running total of a list.
6. Write a function that tests whether a string is a palindrome.
7. Implement the following sorting algorithms: Selection sort, Insertion sort, Bubble Sort
8. Implement linear search.
9. Implement binary search.
10. Implement matrices addition, subtraction and Multiplication