TUMKUR UNIVERSITY

Syllabus as per CBCS 2016-2017 under Semester Scheme

Computer Science

(B.Sc. DEGREE)

FIRST SEMESTER

BSCsT1.1: Computer concepts & OOPs using C++

BSCsP1.2: OOPs using C++ Lab

SECOND SEMESTER

BSCsT2.1: Data Structure Using C++

BSCsP2.2: Data Structure lab

THIRD SEMESTER/

BSCsT3.1: Operating System & UNIX

BSCsP3.2: UNIX LAB

FOURTH SEMESTER

BSCsT4.1: Software Engineering & Database Management System

BSCsP4.2: DBMS lab using MySQL

FIFTH SEMESTER

BSCsT5.1: JAVA & PHP

BSCsP5.2: Java & PHP lab

BSCsT5.3: Computer Graphics

BSCsP5.4: CG Lab using C++

SIXTH SEMESTER

BSCsT6.1: VB.NET & C#

BSCsP6.2: Dot Net Lab

BSCsT6.3: Computer Networks

BSCsP6.4: Project

Computer Science (B.Sc DEGREE)
Revised Syllabus -2016
ABSTRACT

Sem	Paper Code	Paper Name	Hrs / week	Exam Hrs	MAX.MARKS		
					Int. Marks	Ext. Marks	Total
I	BSCsT1.1	Computer concepts & OOPs using C++	04	03	10	90	100
	BSCsP1.2	OOPs using C++ lab	04	03	-	50	50
II	BSCsT2.1	Data Structure Using C++	04	03	10	90	100
	BSCsP2.2	Data Structure Lab	04	03	-	50	50
III	BSCsT3.1	Operating System & UNIX	04	03	10	90	100
	BSCsP3.2	UNIX LAB	04	03	-	50	50
IV	BSCsT4.1	Software Engineering & DBMS	04	03	10	90	100
	BSCsP4.2	DBMS Lab using MySQL	04	03	-	50	50
V	BSCsT5.1	JAVA & PHP	03	03	10	90	100
	BSCsP5.2	Java & PHP lab	03	03	-	50	50
	BSCsT5.3	Computer Graphics	03	03	10	90	100
	BSCsP5.4	Computer Graphics Lab using C++	03	03	-	50	50
VI	BSCsT6.1	VB.NET & C#	03	03	10	90	100
	BSCsP6.2	Dot Net Lab	03	03	-	50	50
	BSCsT6.3	Computer Network	03	03	10	90	100
	BSCsP6.4	Project	03	03	-	50	50

Question Paper Pattern

Duration: 3 Hrs. **Max. Marks: 90**

I.	Answer any 10 Questions out of 12:	(10 x 01 = 10)
II.	Answer any 5 questions out of 07:	(05 x 03 = 15)
III.	Answer any 6 questions out of 08:	(06 x 05 = 30)
IV.	Answer any 5 questions out of 07:	(05 x 07 = 35)

Scheme for Practical Examination

1. Writing two programs	:	10 Marks
2. Execution of two programs	:	30 Marks
3. Practical record	:	05 Marks
4. Viva Voce	:	05 Marks
	Total	**:50 Marks**

Note

1. Internal assessment for each paper(Theory)	:10 Marks
2. Practical examination of 3 hours duration	:50 Marks
3. Theory examination of 3 hours duration	:90 Marks
Total	**:150 Marks**

I Semester

BSCsT1.1: Computer concepts & OOPs using C++

Theory

4 Hrs/week **Total Hrs: 60**

- **Chapter 1: Introduction to Computers 15 Hours**

Introduction: Functional units, Computer Languages, Assembler, Compiler, Interpreter

Number System: Introduction to Number System. Binary arithmetic operations - binary addition, subtraction, multiplication and division (only integer part). 1's and 2's complement – 2's complement subtraction (only signed numbers).

Binary codes: BCD code, 8421 code, Gray code - Conversions - Gray to binary and Binary to Gray, application of gray code (Mention only). Excess – 3 code - Definition and nature of ASCII code.

Boolean algebra: AND, OR, NOT Laws, truth table and circuits. De'Morgan's Theorems-statement, proof using truth tables: Simplification of Boolean expressions using Boolean laws. Standard SOP & POS. Karnaugh maps: definition of Karnaugh map, k-map for 2, 3 and 4 variables. Introduction to Multiplexer & De-Multiplexer. Introduction to flip flop: RS flip-flop, D flip-flop and JK flip-flop.

- **Chapter 2: Introduction to C++ 8 Hours**

Features of C++ language, structure of C++ program, C++ character set, C++ tokens: identifiers, keywords, variables, constants and operators. Types of constants- integer constants float constants, single character constant and string constant. Basic data types – int, char, float and double. Qualifiers – short, long, signed and unsigned. Declaration of variables, Assigning values to variables, Data type conversion: implicit and explicit. Operators : Arithmetic, Assignment, Relational, Logical, Conditional, Bitwise and Special operators. Expressions : Arithmetic expressions, Evaluation of arithmetic expressions, Relational expressions, Logical expressions, Operator precedence. Usage of cin and cout, I/O manipulators, cascading.

- **Chapter 3: Control structures** **6 Hours**

(i) Branching- if, if-else, nested if, switch.

(ii) Looping- while, for, do-while loops, Nested loops.

(iii) Jump statements- break, continue and exit().

- **Chapter 4: Arrays, pointers and structure** **5 Hours**

Arrays: Declaration, accessing array elements, classification: declaration and initialization of 2D arrays. Strings: Definition, string handling functions.

Pointers: Introduction and declaration.

Structure & Union : Definition, declaration.

- **Chapter 5: Introduction to OOPs** **6 Hours**

Characteristics of OOPs – Class & Objects, data abstraction, data hiding, encapsulation, data binding, inheritance, polymorphism and benefits of OOPs.

Class & Objects: class definition, access specifiers and declaration of object. Passing objects as arguments, returning an object from a function, array of objects. Scope resolution operator, nesting of member functions, static data member, static member functions, friend function, and friend class. Nested classes, this pointer.

- **Chapter 6: Functions** **4 Hours**

Definition, types of user defined functions, function prototype, call by value, call by address and call by reference. Function overloading, functions with default arguments, inline functions.

- **Chapter 7: Constructors , destructor & Operator Overloading** **8 Hours**

Constructors & destructors: constructors and their characteristics, types of constructors- default, parameterized, overloaded, copy, dynamic constructors. Destructors and their characteristics. Syntax of operator

overloading function, rules for operator overloading, overloading unary ++ and binary + operator.

- **Chapter 8 : Inheritance** **5 Hours**

Definition, types of inheritance – single, hierarchical, multiple, multilevel and hybrid inheritance. Virtual base classes, and virtual functions, pure virtual functions and abstract class, concepts which cannot be inherited.

- **Chapter 9**: **Stream** **3 Hours**

  Files-Introduction-Stream classes, file IO operations.

References Book:

1) Lippmann: C++ primer,3/e Pearson Education
2) Object oriented programming with C++, E.Balagurusamy,Tata McGraw Hill publications.
3) The C++ Programming language, Strousstrup,Pearson edition, 3rd edition.
4) Object-Oriented Programming with C++ by M.T. Somashekara, D.S. Guru, H.S. Nagendraswamy and K.S. Manjunatha, PHI, New Delhi.
5) Lippmann: C++ primer,3/e Pearson Education

BSCsP1.2: OOPs using C++

Practical

4 Hrs/Week **Total Marks: 50**

Part A

1. Write a C++ program to calculate area and circumference of circle.
2. Write a C++ program to find the largest of 3 numbers.
3. Write a program to illustrate logical operators.
4. Write a program to perform addition, subtraction, multiplication and division using switch case.
5. Write a program to calculate the sum of odd & even numbers in any given array.
6. Write a program to print the following pattern using nested for loop.

7. Write a program to reverse a given number.
8. Write a program to find the sum of N natural numbers.
9. Write a program to illustrate call by value and call by address.
10. Write a program to illustrate inline function.
11. Write a program to demonstrate the use of structure.

Part B

1. Write a program to generate a bill. The bill contents serial no, description, quantity, rate/unit and amount.
2. Write a program to find the factorial of a number using function overloading.
3. Write a program to demonstrate the overloaded constructor and destructor.
4. Write a program to overload binary + to concatenate two strings.
5. Writer a program for date validation.

6. Write a program to print the sum of two complex numbers using friend function.
7. Write a program to add two matrices by overloading binary + operator.
8. Write a program to demonstrate the multilevel inheritance.
9. Write a program to demonstrate static data member and static member function.
10. WAP to demonstrate nested member function.

II Semester

BSCsT2.1: Data Structure using C++

4 Hrs/week **Total Hrs: 60**

- **Chapter 1 : Introduction to Data Structure** **6 Hours**

Definition, Classification of data structure: primitive, non-primitive, operation on data structure. Pointers and Dynamic memory allocation: memory allocation functions: malloc(), calloc(), realloc() and deallocation of memory- free().

- **Chapter 2: Linked List** **10 Hours**

Definition, Components of linked list, representation of linked list, advantages and disadvantages of linked list. Types of linked list: Singly linked list, Doubly linked list, Circular linked list. Operation on Singly linked list: Creation, Insertion, Deletion, Search and Display.

- **Chapter 4: Stacks** **8 Hours**

Definition, stack operations, array & Linked list implementation of stacks .Infix, prefix and postfix notation, Conversion of an arithmetic expression from infix to prefix, infix to postfix, Application of stacks- recursion, evaluation of postfix expression, parenthesis evaluation, TOH.

- **Chapter 5: Queues** **6 Hours**

Definition, array & Linked list implementation of queue, types of queues: simple queue, circular queue, double ended queue, priority queue.

- **Chapter 6: Trees** **7 Hours**

Definition, Binary tree, Complete Binary tree, Binary Search Tree. AVL Trees. Tree terminology: degree of node, level, depth, height, root node, terminal node, internal node, leaf node, siblings, parent node, ancestors of a node, forest.

Binary Tree: Array & Linked list representation of Binary tree, Creation of Binary Search tree and Tree traversal Techniques: Preorder, Inorder and Postorder.

- **Chapter 7: Sorting & Searching** **3 Hours**

Sorting : Bubble sort, Insertion Sort, Selection sort.

Searching : Linear search, Binary search.

Chapter 8: Introduction to Graph Theory 15 Hours

Definition of a graph-finite and infinite graphs - incidence and degree isolated vertex - pendant vertex – null graph - regular graph-isomorphic graph – sub graphs –walks – paths – circuits - connected graphs - disconnected graphs - components of a graph - operations on graphs – Euler path & Euler graphs – Hamiltonian Paths & Graphs – Weighted graphs (No Theorems) Definition of Trees – Properties of Trees - Pendant Vertices in a Tree - Distance and centers in a Tree - Rooted and Binary Trees - Spanning Trees. (No theorems) Cut sets and Cut vertices – Fundamental circuits and cut sets – Edge Connectivity - Vertex connectivity, Incidence Matrix, Adjacency Matrix.

Reference Book

1. M.T. Goodrich, R. Tamassia and D. Mount, Data Structures and Algorithms in C++, John Wiley and Sons, Inc., 2004.
2. Robert L. Kruse and A.J. Ryba, Data Structures and Program Design in C++, Prentice Hall, Inc., NJ, 1998.
3. Data Structures through C++ by Yashwant P Kanetkar published by BPB Publications
4. Data Structures and Algorithms in C++ by Adam Drozdek-Duquesne published by Thomson Press (India) Ltd; 3rd edition
5. Narasingh Deo : " Graph Theory with Applications to Engineering and Computer Science" , PHI-India
6. F Harary : "Graph Theory" , Narosa Publishing House

BSCsT2.2: Data Structure lab

Practical

4 Hrs/Week **Total Marks: 50**

1. Write a program to insert an element into a singly linked list.
2. Write a program to delete an element from a singly linked list.
3. Write a program to merge two singly linked list.
4. Write a program to create & display doubly linked list.
5. Write a program to create & display circular linked list.
6. Write a program for array implementation of stack.
7. Write a program to convert infix expression into post fix expression.
8. Write a program to evaluate of post fix expression.
9. Write a program array implementation of queue.
10. Write a program to implement stack using linked list.
11. Write a program to implement queue using linked list.
12. Write a program to implement Tower of Hanoi.
13. Write a program to perform: create, display in a binary search tree.
14. WAP to Sort n array element using Insertion sort.
15. WAP to search an array element using Binary search technique.

III Semester Syllabus

BSCsT3.1: Operating System & UNIX

Theory

3 Hrs/Week **Total Hrs: 60**

- **Chapter 1: Introduction to Operating System 6 Hours**

Introduction to Operating System, Types of operating system – Single user, Multiuser, Mainframe Systems, Desktop Systems, Multiprocessor Systems, Distributed Systems, Clustered Systems, Real - Time Systems, operating system components, operating system services.

- **Chapter 2: Process & CPU Scheduling 12 Hours**

Process Concept, process state diagram, process Control block, Process Scheduling - Scheduling queues, and scheduler. Preemptive and Non-preemptive Scheduling, Scheduling Criteria, Scheduling algorithms- FCFS, Shortest job first, Priority scheduling, Round Robin Scheduling, multilevel feedback queue scheduling.

- **Chapter 3: File System 07Hours**

File Concept, Access Methods, Directory Structure, Protection, File System Structure, Allocation Methods, Free space Management.

- **Chapter 4: Memory Management 12 Hours**

Management Methods: Single contiguous, Multiple Partitioned: Fixed size, Variable size and Dynamic size, Paging and Segmentation. Page Replacement Algorithms: FIFO and LRU

- **Chapter 5: I/O Systems: 08 Hours**

Overview of I/O Systems, Secondary Storage Structure- Disk Structure, Disk Scheduling-FCFS-SSTF-SCAN –CSCAN.

- **Chapter 6: Architecture of UNIX 5 Hours**

Architecture of UNIX system, architecture of kernel, features of Kernel. Unix File system-Boot block, super block, I-node block and data blocks, Types of files, types of users, UNIX directory structure, File access methods. File and directory related commands-ls, cat, cal, date, calendar, who, printf, tty, sty,

uname, passwd, echo, tput, bc, script, spell and ispell, pwd, the Home directory, absolute pathnames, using absolute pathnames for a command, cd, mkdir, rmdir, Relative pathnames.

- **Chapter 7: Special Tool Utility 5 Hours**

File permission and their modes, path, head, tail, wc, tr, cut, sort, grep, egrep, fgrep, tar. The process: shell process, parent and children, process status, system process, multiple jobs in background and foreground, changing process priority with nice, premature termination of process. Communication commands-,write, wall, mesg, kill and finger command.

- **Chapter 8: Shell Programming 5 Hours**

Shell Basics-Types of shells, Shell functionality, Environment. Writing first script-Writing script & executing basic script, Debugging script, Making interactive scripts, variables (default variables), Mathematical expressions. Conditional statements-If-else-elif, Test command, Logical operators-AND, OR, NOT, case –esac. Loops- While, For, Until, Break and continue.

Reference:

1. Silberschatz, Abraham and Galvin, Peter Baer. Operating System Concepts. 5th Edition. John Wiley and Sons
2. Tanenbaum, S Andrew, Operating Systems – Design and Implementation, PHI,2001.
3. UNIX – The Complete Reference– Second Edition.
4. Kochan, Unix Shell Programming, Pearson
5. Sumithaba Das – UNIX: Concepts and Applications 4.e

BSCsP3.2 : UNIX Shell Programming LAB

Practical

4 Hrs/Week **Total Marks: 50**

1. Use of Basic UNIX Shell Commands: ls, mkdir, rmdir, cd, cat, touch, file, wc, sort, cut, grep, dd, dfspace, du, ulimit
2. Write a Shell Program to check whether a given year is leap year or not.
3. Write a shell program to check whether a given string is a palindrome or not.
4. Simple shell script for basic arithmetic and logical calculations.
5. Write a shell program to count the number of vowels.
6. Write a shell program to find the factorial of a given number.
7. Write a shell script to count lines, words and characters in its input
8. Write a shell program to print a string in reverse order.
9. Write a shell program to display all the files in the current directory.
10. Write a shell program to illustrate pattern matching.
11. Write a shell script that computes the gross salary of a employee according to the following rules: i)If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic. ii)If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic The basic salary is entered interactively through the key board.
12. Shell scripts to perform various operations on given strings.
13. Write a shell script to compute GCD & LCM of two numbers.
14. Write a shell script to find whether a given number is prime.

IV Semester

BSCsT4.1: Software Engineering & Data Base Management System

Theory

3 Hrs/Week **Total Hrs: 60**

Chapter 1: Introduction: - **02 hours**

Evolution of software, Characteristics of software, software applications Components of software, Software myths, Software problems, Software reuse.

Chapter 2: The Process: - **05 hours**

Definition of Software engineering, Software engineering models: Waterfall, Prototyping, Spiral, RAD and 4GT. (Latest life cycle models can be discussed)

Chapter 3: Project Management : **03 hours**

People, Product, Process and Project. Metrics: Measures, Metrics and indicators. Types of metrics: Size oriented, Function-oriented metrics and metrics for software quality. Software Requirement Specification (SRS).

Chapter 4: Design and Testing: **05 hours**

Data modeling, Data flow diagram (DFD) and - Design process, Design principles, Design concepts, coding concepts.

Software testing: - Unit testing, Integration testing, System testing, acceptance testing. Black box and White box testing.

Chapter 5: Database Fundamentals: **06 hours**

Basics of database, traditional file oriented approach, database and database users, characteristics of the database approach, different people behind DBMS, implications of database approach. Advantages and disadvantages of using DBMS, database administrator (DBA), when not to use a DBMS.

Chapter 6 : Database System Concepts and Architecture 06 Hours

Introduction, data models, schemas, and instances. Different types of data models, DBMS architecture (logical and physical) and data independence. Database languages, DBMS interfaces. The database system environment,

distributed DBMs, client-server architecture, classification of database management systems.

Chapter 7 : Data Modeling Using the Entity-Relationship Model 06 Hours

Introduction, high level conceptual data models for database design with an example. Entity and attributes, types of attributes, entity types, entity sets and keys, ER model concepts, notation for ER diagram, E.F. Codd rules, cardinality. Abstraction and aggregation.

Chapter 8 : Relational Database Language 13 Hours

Introduction, difference between DBMS and RDBMS, basic terminologies used in RDBMS, introduction to SQL, advantages and disadvantages, data types, types of SQL statements, DDL statements: create, alter, drop, truncate , DML statements : insert, delete ,update and Select. DCL statements: commit, rollback, save point and TCL statement: grant and revoke queries on the database, operators used in SQL, distinct clause, set operators, SQL alias, SQL dual table, SQL functions, order by and having clause, joins, sub queries, indexes and views in SQL, aggregate and grouping functions.

Chapter 9 : Functional Dependencies and Normalization 09 Hours

Introduction, relational model constraints, basic terms, database design, database anomalies, informal design guidelines for relational schemas, decomposition, functional dependencies, normal forms based on primary keys, normalization: first, second and third normal forms and Boyce-Codd normal form fourth and fifth normal forms.

Chapter 10: Relational Data Model and Relational Algebra 05 Hours

Introduction to the relations model concepts. Relational model: constraints and relational database schema, operations on relations: retrieval and update.

Relational algebra: types of operations on relational algebra, unary operations: select and project, binary relational operations: union, intersect

and minus, relational algebra on set theory: Cartesian product, additional Relational database design using E R diagram.

REFERENCE BOOKS:

1. Roger S Pressman: “Software Engineering”, 4th edition
2. Ian Sommerville:“Software Engineering”, Pearson Education Asia, 6th Edition,2002.
3. Pankaj Jalote, Narosa:“An Intergrated Approach to Software Engineering” Pub 1995
4. Carlo Ghezzi, Mehdi Jazeryeri and Dino Mandrioli: Fundamentals of SoftwareEng
5. Elmasri and Navathe, Fundamentals of Database Systems (4th Edition), Pearson Education, 2003
6. Sundrraman, Oracle 9i programming A Primer, 1/e Pearson Education.
7. Kahate, Introduction to Database Management System, Pearson Education 2004.
8. Abrahamsi, Silberschat, Henry. F. Korth, S. Sudarshan, Database System Concepts,Mc.graw hill.

BSCsP4.2: DBMS Lab

Practical

4 Hrs/Week **Total Marks: 50**

1. **The Student detail database has a table with the following attributes. The primary keys are underlined.**

   Student (<u>regno number</u>, name varchar2, dob date, marks number)

   a) Create the above table.
   b) Remove the existing attribute marks from the table.
   c) Change the data type of regno from number to varchar2.
   d) Add a new attribute phno to the existing table.
   e) Enter 5 tuples into the table.
   f) Display the tuples in table

2. **A Library database has a table with the following attributes.**

   Library (<u>bid number</u>, title varchar2, author varchar2, publisher varchar2, yearof_pub number, price number)

   a. create the above table.
   b. Enter 5 tuples into the table.
   c. Display all the tuples from the table.
   d. Display different publishers from table.
   e. Arrange the tuples in the alphabetical order of book title.
   f. List the details of all books whose price range between 100rs and 300rs.

3. **The Emp salary database of an organization has a table with the following attributes.**

   Empsal (<u>Empcode number</u>, Ename varchar2, dob date, dept varchar2, salary number(10,2))

   a. Create the above table.
   b. Enter 5 tuples into the table.
   c. Display the no of employees working in each dept.
   d. Find sum of the salaries of all employees.
   e. Find highest and lowest salary of all employees.
   f. Find the sum and average salaries of employees of a particular department.

g. Increase the salary of those employees working for the "computer science" dept.

4. An Inventory database has the following table.

Items (itemcode number, name varchar2, price number)

Purchase (itemcode number, qty number)

a) Create the tables with the above attributes.
b) Enter 5 tuples into the tables.
c) List the items purchased.
d) List the items which are not purchased by anyone.

5. **Consider the Insurance database given below. The primary keys are underlined and data types are specified.**

Person (driverid varchar2, name varchar2, address varchar2)

Car (regno varchar2, model varchar2, year number)

Owns (driverid varchar2, regno varchar2)

Accident (reportno number, accdate date, location varchar2)

Participated (driverid varchar2, regno varchar2, reportno number, dmgamt number).

a) Create all tables.
b) Enter at least 5 tuples for each table.
c) Update the damage amount for each car accident.
d) Add a new accident to the database.
e) Find the total no of people who owned cars that were involved in accidents in the particular year.
f) Find the no of accidents in which cars belonging to a specific model were involved.

6. **A Bank database has 2 tables Customer and Account.**

Account (accno number, acctype varchar2, branch varchar2, accstatus varchar2, chequef varchar2)

Customer (custno number, cname varchar2, city varchar2, accno number, balance number)

a) Create the above tables and specify the primary and foreign keys.
b) Enter 5 tuples for each table.
c) List the customers from "Bangalore" who have been cheque facility.

d) List all the customers whose balance is > 3000 and have an active account.

e) Find the current outstanding balance amount of branch "malleswaram".

7. **Consider the following database of Student enroll has the following tables with attributes.**

Student (regno number, name varchar2, major varchar2, dob date)

Course (cno number, cname varchar2, dept varchar2)

Enroll (regno number, cno number, sem number, tmarks number)

Tbook (bkno number, title varchar2, publisher varchar2, author varchar2) Bk_adpt (cno number, bkno number, sem number)

a) Create all the tables.

b) Enter 5 tuples for each table.

c) Insert a record into the tbook table.

d) Insert a record into bk_adpt table.

e) List the students registered but not enrolled.

f) List the books which have been adopted.

8. **Consider the following an Order processing data base application in a company.**

Customer (custid number, cname varchar2 ,city varchar2)

Corder (orderno number,ordate date, custid number, oramt number)

Item (itemno number, name varchar2, price number)

Oritem (orderno number, itemno number, qty number)

Warehouse (whno number, city varchar2)

Shipment (orderno number, whno number, shipdate date)

a) Create all the tables.

b) Enter 5 tuples for each table.

c) List the orderno for the order that were shipped from the all the ware houses that the company has in a specific city.

d) Demonstrate the delete of itemno 21 from item table and make that field "null" in the or item table.

9. Write a PL/SQL Program to find largest of 2 numbers using if statement.

10. Write a PL/SQL Program to find the sum of first 10 natural numbers using Loop structure.
11. Write a PL/SQL Program to find factorial of a given number.
12. Write a PL/SQL Program to Create a Procedure to add 2 numbers.
13. Illustrate the conversion of first normal form to second normal form.

V Semester Syllabus

Theory

BSCsT5.1: Java Programming &PHP

3 Hrs/Week **Total Hrs: 52**

- **Chapter 1: Introduction to Java** **8 Hours**

Introduction to Java and Java applications; Java Development Kit (JDK); Java is interpreted, byte code, JVM; Object-oriented programming; simple java programs. Data types and other tokens: arrays, white spaces, literals, assigning values; creating and destroying objects; access specifies. Operators and expressions: Arithmetic operators, bitwise operators, relational operators, assignment operator, ternary operator. Logical expression. Control statements: Selection statements, iteration statements, jump statements. Arrays: One dimensional & two dimensional strings.

- **Chapter 2: Class and Inheritance** **10 Hours**

Defining a class, adding data members and methods, creating objects, accessing class members, constructors, methods overloading, static members.

Inheritance: extending a class, overriding methods, final variables and methods, final classes, finalize methods, super keyword, abstract methods and classes, wrapper classes, defining interface extending interface, implementing interface, accessing interface variable, api packages-lang, util, user defined package, hiding classes.

- **Chapter 3: Exception Handling and Multi Threading** **8 Hours**

Exception: Fundamentals of exception, build –in exception, exception types, try and catch, multiple catch, nested try block, finally.

Threads: Creating threads, extending the threads class, stopping and blocking a thread, life cycle of a thread, using thread methods, thread exceptions, thread priority, implementing the Runnable Interface.

- **Chapter 4– Applets 10 Hours**

The Applet Class: Two types of applets; applet basics; applet architecture; an applet skeleton; simple applet display methods; AWT classes, window fundamentals, creating frame window and handling events, working with graphics, working with colour, working with fonts, understanding layout managers, menu bars and menus, dialog boxes. Introduction to swing, a simple swing application.

- **Chapter 5– Servlets 6 Hours**

Servlets: Background; The life cycle of a servlet; a simple servlet; the servlet API; The Concept of JDBC; Overview of the JDBC process; JDBC Driver Types; JDBC Packages;

- **Chapter 6- PHP: 10 hours**

HTML forms, Basic syntax – Data Types - Variables - Constants - Expressions - Operators - Control Structures-Arrays, Functions. Database Connections.

Reference Books:

1. Herbert Schildt: Java The complete Reference , 7th Edition, Tata McGraw Hill, 2007.
2. Object Oriented Programming with Java, M.T. Somashekara etal., PHI Learning private ltd, New Delhi 2016.
3. Jim Keogh: J2EE- The Completer Reference, Tata McGraw Hill, 2007
4. Stephanie Bodoff: The J2EE tutorial, 2nd Edition, Pearson Education, 2004
5. Y. Daniel Liang: Introduction to JAVA Programming, 7th Edition, Pearson Education, 2007
6. Java programming by E. Balagurusamy 5th Edition.
7. PHP: The Complete Reference

BSCsP5.2: Java & PHP Lab

Practical

4 Hrs/Week **Total Marks: 50**

1. Write a Java program to find the GCD of number.
2. Write a JAVA Program to demonstrate Constructor for calculating area of rectangle.
3. Write a JAVA Program to demonstrate Method Overloading.
4. Write a program in Java for String handling which performs the following: i) Reverses the contents of a string given on console and ii) converts the resultant string in upper case.
5. Write a JAVA Program on interfaces to calculate the area of a rectangle and triangle.
6. Write a JAVA Program to Design a simple calculator using Switch Statement
7. Write a program to calculate area and perimeter of a rectangle using Super keyword.
8. Write a program to sort given Strings.
9. Write a java applet program to print some text.
10. Write a java applet program to understand the properties of the font.
11. Write a java applet program to demonstrate the drawing function (draw lines, rectangle, ellipse and circle.
12. Write a java servelet program to execute both request and response.
13. Write a PHP Program to find the Sum and Average of five subject marks and display the result
14. Write a PHP program to print prime number up to n numbers
15. Write a PHP Program to find the biggest of n numbers using arrays
16. Write a PHP Program to calculate factorial of a given number using function
17. Design student online application form and store in database and display

V Semester

BSCsT5.3: – Interactive Computer Graphics
Theory

3 Hrs/Week **Total Hrs: 52**

Interactive Computer Graphics

Chapter 1: Graphics Systems and Output Primitives (12 Hours)

Application for CG, CG classification-Graphics software-CRT functioning-Factors affecting CRT- Raster and Random scan monitors-Shadow mask method, display processor with raster system- Raster co-ordinate system-color mapping- Instruction set and Raster system applications.

Output Primitives: Line drawing methods-Direct, DDA and Bresenhams, line attributes, Circle drawing – Direct and midpoint circle drawing – ellipse drawing-Bresenhams ellipse algorithm-Area filling-scanline area filling and character attributes

Chapter 2: Two-dimensional Transformation (08 Hours)

Basic Transformation, Translation, Rotation-Rotation with arbitrary point, Scaling-Scaling with fixed point, Reflection and Shear, matrix representation- homogeneous co-ordinates, Composite transformation-Raster methods for transformation.

Chapter 3: Windowing and Clipping (06 Hours)

Window, viewport, viewing transformations, clipping process, point clipping, line clipping- Cohen Sutherland line clipping algorithm, midpoint subdivision algorithm, Area clipping, Sutherland and Hodgeman polygon clipping algorithm, text clipping, Window to view port transformation, Blanking.

Chapter: **3D-Graphics and Segments (14 Hours)**

3D-coordinate system, 3D displays technique-Parallel Projection, Perspective Projection, Intensity Cueing. 3D Transformations-Translation, Scaling, Rotation, Reflection, Shearing, polygon surfaces, polygon tables, curves, Bezier curves, Octree, Fractals, Hidden line and surface removal algorithm-Depth buffer, Back-face and scan-line. Constructive Solid Geometry method- Union, Intersection, Difference. Sweep representation.

Introduction to segments, functions for segmenting, display file, segment attributes, display file compilation.

Chapter 5: Graphical Input devices and Input Techniques (10 Hours)

Input Devices: Keyboard, Mouse, Joystick, Touch panels, Track ball, Light pen, Graphic tablets. Predefined Graphics functions.

Positioning techniques, Grid, Constraints, Dynamic manipulation, Gravity field, Rubber band, Dragging, Selection technique, Menu, Pointing and selection by naming.

References:

1. Donald Gearn & M. Pauline Baker, Computer Graphics C, PHI 1990
2. Steven Harrington, Computer Graphics, McGH.
3. Newman & Sproull, Principles of Interactive Computer Graphics, McGH.
4. Yeshwant P. Kanetkar, Graphics under C, BPB publication.
5. J.D.Foley, A.V. Dam, S.K. Feiner and J.F.Hughes, Computer Graphics, Addison Wesley,1997
6. Cooley, The Essence of Computer Graphics, Pearson Education.
7. Sinha-Computer Graphics.

BSCsP5.2: Computer Graphics Practical

3 Hrs/Week **Total Marks: 50**

Part-A

1. Write a program to draw a straight line using DDA technique.
2. Write a program to draw a straight line using Bresenham's technique.
3. Write a program to draw a circle using DDA technique.
4. Write a program to draw a Circle using Bresenham's technique.
5. Write a program to draw a triangle to perform translation
6. Write a program to draw a triangle to perform scaling
7. Write a program to draw a triangle to perform Rotation
8. Write a program to draw pie chart
9. Write a program to draw Histogram
10. Write a program to clip a triangle against a given window.
11. Write a program to animate a man walking with an umbrella.
12. Write a program to rotate an object from one end of the screen to the other end using the built-in line and circle functions.

VI Semester

BSCsT6.1: DOT NET with C#

Theory

3 Hrs/week **Total Hrs: 52**

Chapter 1: Introduction to C# (16 Hours)

.Net Framework: basic concepts of .net framework: MSIL, JIT, CLR, CLS, Execution, Assemblies, Application Domain. Features of C#, Intermediate language, Meta Data,

C# core programming : Structure of C# program: name space, types, value type, simple type, reference type, boxing and unboxing, and their conversions. Variables & parameters, implicit conversion, explicit conversion and user-defined conversion.

Expressions, Operators: Expressions, types of expressions, C# operators: new operator, types of operator, checked & unchecked operators, arithmetic operators, shift operators, logical operators, conditional operators, conversion operators, control statements selection statements, iteration statements,

Arrays & Collections: Introduction to arrays, Declarations and its types. Introduction to collection, Array list, jagged array, stack implementation.

C# Object oriented programming : Class & Methods: Class, declarations, class modifiers, abstract class, sealed class, access modifiers, new modifier, methods, method parameters, virtual methods, method overloading, method overriding, constructors & destructors.

Chapter 2: Inheritance & Interfaces (08 Hours)

Inheritance: introduction, types, base class inheritance, derived class inheritance. Interface: Interface, declaration modifiers, methods, properties, events. Exception Handling: Definition, Exception handling techniques (statements), types, creating our own exception class.

Chapter 3: Polymorphism & Delegates (08 Hours)

Polymorphism: Definition, base class with virtual method, derived class with override method. Delegates: Introduction, types, multi-cast delegates,

namespaces & declaration. WinForms & Windows Applications: More Windows Controls and Standard Dialog Boxes

ADO.net: Components of ADO.net, Data Access using ADO.net (database connectivity)

Chapter 4: ASP.net (10 Hours)

Introduction to .NET, Server side scripting, Common Gateway interface, , server pages technology ,Internet Server Application Programming Interface, Advantages of ASP.net, Migration from ASP to ASP.net applications, ASP.net file types, code behind, accessing code behind, ASP.net configuration.

Chapter 5 ASP.NET Controls (10 Hours)

Server controls, advantages, types of server controls, web controls and its properties, advantages of web controls, validation server controls.

Data Access in ASP.net, Data binding in web forms, types of data binding, data bind method, data binding with database, steps for data access, events. Advanced Features in ASP.Net: Objects in ASP.net, ASP.net security, Caching, types of caching.

Reference Books:

ASP.NET 4.0 Black Book

Andrew Troelsen: Pro C# with .Net 3.0, 4th Edition, Wiley India, 2009.

E.Balaguruswamy: Programming in C#, 2nd Edition, Tata McGraw Hill, 2008.

Tom Archer: Inside C#, WP Publishers, 2001.

Herbert Schildt: C# The Complete Reference, Tata McGraw Hill, 2004.

BSCs6.2:DOT NET with C# Practical

3 Hrs/Week **Total Marks: 50**

1. Write a Program in C# to Check whether a number is Palindrome or not.
2. Write a Program in C# to demonstrate Command line arguments processing.
3. Write a Program in C# to find the roots of Quadratic Equation.
4. Write a Program in C# to demonstrate boxing and unBoxing.
5. Write a Program in C# to implement Stack operations.
6. Write a program to demonstrate Operator overloading.
7. Write a Program in C# to find the second largest element in a single dimensional array.
8. Write a program to reverse a given string using C#.
9. Using Try, Catch and Finally blocks write a program in C# to demonstrate error handling.
10. Design a simple calculator using Switch Statement in C#.
11. Demonstrate Use of Virtual and override key words in C# with a simple program
12. Implement linked lists in C# using the existing collections name space.
13. Write a program to demonstrate abstract class and abstract methods in C#.
14. Write a program to illustrate the use of different properties in C#.
15. Demonstrate arrays of interface types with a C# program.
16. Design a student's online admission application form with a photo.

VI Semester
BSCs6.3: Computer Network

3Hrs/Week **Total :52 Hrs**

- **Chapter 1 : DATA COMMUNICATIONS : 10 Hrs**

Networks – Components: Data Representation, need of network, services. Network models-peer to peer, client server, distributed. Application of network and criteria, Types of connections: Topologies-mesh, star, bus, ring, Categories of Networks -LAN, WLAN,MAN, WAN .

- **Chapter 2:** Protocols and standards **15 hrs**

Protocols and standards – standards Organizations – internet standards – internet administration - The OSI model and the TCP/IP protocol suit : the OSI model – layers in the OSI model – TCP/IP protocol suit – addressing – IP versions

- **Chapter 3 : Application layer 7 Hrs**

Domain Name Space (DNS) – SMTP – FTP –TFTP- HTTP- TelNet- Architecture-Remote Login – WWW –Introduction to Socket- Introduction to Security –cryptography. The Future of TCP / IP Adress Classes, IP-IPV6 format.

- **Chapter 4 : Data link layer , Network layer & Transport Layer 20 Hrs**

Error detection and correction –Parity checking,Checksum,CRC, Hamming Codes,Flow-control and error control- Sliding window – HDLC-LAN – Ethernet IEEE 802.3 – IEEE 802.4 – IEEE 802.5 – IEEE 802.11 – FDDI – SONET – Bridges.

Network layer-Internetworks – Packet switching and datagram approach – IP addressing methods – Subnetting – Routing-Routing model , Algorithm– Routing table – Routers.

Transport layer: Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) Transmission Control Protocol (TCP) –Port Numbers– Congestion Control – Quality of Services (QOS)

- **Chapter 5 : Modern Wireless Communication Systems 8 Hrs**

Wireless Networks Generation -Wireless Transmission Protocols- Wired Vs Wireless Networks Present Day Mobile Communication-The Cellular Fundamentals-Transmitter and Receiver Techniques

Reference Book

1. TEXT BOOK : TCP/IP Protocol Suit by Behrouz A. Forouzan Tata McGraw-Hill Third Edn.
2. Mobile computing by Rajkamal, Oxford University Press
3. Jochen Schillr - Mobile Communication, Addison Wesley, 2000.

BSCsP6.4 Project Lab

3 Hrs/Week **Total Marks: 50**

Guidelines:

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Project should be carried out in batch with minimum of three and maximum of five students, and it may be a work using the software packages that they have learned or the implementation of Concepts from the papers studied or implementation of any innovative idea.
- The Project work should be compulsorily done in the college only under the supervision of the concerned department staff after taking **project synopsis approval by the BOE Chairman in the beginning of the semester.**
- **The approved synopsis should be included in project report.**

University Exam will be conducted as follows.

- Viva-voce will be conducted at the end of VI semester for 50 marks.
- Both the Examiners (50%+50%) should conduct the Viva-Voce Examination during practical session. Out of 50 marks, 25 for Project Evaluation and 25 for Viva. For awarding a pass, a candidate should have obtained 40% of the Total 100 marks.

- Report should be in A4 paper & book binding with the following table of contents

1) Certificate
2) BOE approved copy
3) Acknowledgement
4) Synopsis
5) Contents
6) About the project
7) Analysis
8) Design
   a) DFD
   b) ER Diagram
9) Coding
10) Testing
11) Reports/output
12) Conclusion
13) Bibliography

Scheme for Practical Examination

1. Writing about project	:	10 Marks
2. Demonstration of Project	:	30 Marks
3. Project Report	:	5 Marks
4. Viva Voce	:	5Marks
Total	**:**	**50 Marks**

Note

1. Internal Assessment for each paper(Theory)	:	10 Marks
2. Practical Examination of 3 hours duration	:	50 Marks
3. Theory Examination of 3 hours duration	:	90 Marks
Total	**:**	**150 Marks**

TUMKUR UNIVERSITY

Syllabus as per CBCS 2016-2017 under Semester Scheme

Bachelor of Computer Applications (BCA)

Computer Science (BCA)

FIRST SEMESTER

BCACsT1.1: Programming concepts using C.
BCACsP1.2: C programming lab

BCACsT1.3: Operating system
BCACsP1.4: DOS & Ms-office lab

BCACsT1.5: Computer Hardware and Networking
BCACsP1.6: Computer Hardware Lab

SECOND SEMESTER

BCACsT2.1: Database management systems
BCACsP2.2: DBMS lab

BCACsT2.3: Digital electronics
BCACsP2.4: Digital electronics lab

BCACsT2.5: Data structure using C
BCACsP2.6: Data structures using C lab

THIRD SEMESTER

BCACsT3.1: Computational Numerical Techniques
BCACsP3.2: Numerical analysis lab

BCACsT3.3: Object oriented programming using C++
BCACsP3.4: C++ using oops lab

BCACsT3.5: Internet Programming
BCACsP3.6: HTML & XML lab

FOURTH SEMESTER

BCACsT4.1: Computer networks and data communication
BCACsP4.2: Static website project lab

BCACsT4.3: UNIX operating system
BCACsP4.4: UNIX lab

BCACsT4.5: ADA
BCACsP4.6: ADA lab

Computer Science (BCA) Syllabus -2016

ABSTRACT

SEM	PAPER CODE	PAPER NAME	HRS / WEEK	EXAM HRS	MAX.MARKS		
					INT. MARKS	EXT. MARKS	TOTAL
I	BCACsT1.1	Programming concepts using C	04	03	10	90	100
	BCACsP1.2	C programming lab	04	03	-	50	50
	BCACsT1.3	Operating System	04	03	10	90	100
	BCACsP1.4	DOS & MS-Office lab	04	03	-	50	50
	BCACsT1.5	Computer Hardware and Networking.	04	03	10	90	100
	BCACsP1.6	Computer Hardware Lab	04	03	-	50	50
2	BCACsT2.1	Database management systems	04	03	10	90	100
	BCACsP2.2	DBMS lab	04	03	-	50	50
	BCACsT2.3	Digital electronics	04	03	10	90	100
	BCACsP2.4	Digital electronics Lab	04	03	-	50	50
	BCACsT2.5	Data structure using C	04	03	10	90	100
	BCACsP2.6	Data structures using C lab	04	03	-	50	50
3	BCACsT3.1	Computational Numerical Techniques	04	03	10	90	100
	BCACsP3.2	Numerical analysis lab	04	03	-	50	50
	BCACsT3.3	Object oriented programming using C++	04	03	10	90	100
	BCACsP3.4	C++ using oops lab	04	03	-	50	50
	BCACsT3.5	Internet Programming	04	03	10	90	100
	BCACsP3.6	HTML & XML lab	04	03	-	50	50
4	BCACsT4.1	Computer networks and data communication	04	03	10	90	100
	BCACsP4.2	Static website Lab	04	03	-	50	50
	BCACsT4.3	UNIX operating system	04	03	10	90	100
	BCACsP4.4	UNIX lab	04	03	-	50	50
	BCACsT4.5	ADA	04	03	10	90	100
	BCACsP4.6	ADA lab	04	03	-	50	50

Question Paper Pattern

Duration: 3 Hrs. **Max. Marks: 90**

I.	Answer any 10 Questions out of 12:	(10 x 01 = 10)
II.	Answer any 5 questions out of 07:	(05 x 03 = 15)
III.	Answer any 6 questions out of 08:	(06 x 05 = 30)
IV.	Answer any 5 questions out of 07:	(05 x 07 = 35)

1st Sem BCA

Paper: BCCsT1.1: PROGRAMMING CONCEPTS Using C

4 Hrs /Week **Total: 60 Hrs**

❖ **Chapter 1: Introduction to Computer Programming: 3 Hrs**

Steps in problem solving, program design tools, basic control structures, structured programming.

❖ **Chapter 2: Overview of C 6 Hrs**

Introduction, importance of C, sample C program, basic structure of C program, programming style, executing a C program**.** Constants, variables and data types. Introduction, C character set, C tokens, identifiers, constants, variables, data types, declaration of variables, assigning values to variables, defining symbolic constants.

❖ **Chapter 3. Operators and expressions 4 Hrs**

Operators in C, arithmetic operators, relational operators. Logical operators, assignment operators, increment and decrement operators, conditional operators, bitwise operators, special operators, precedence of arithmetical expression, relational expression, logical expressions, type conversion in expressions, operator precedence.

❖ **Chapter 4. Managing input and output operations 4Hrs**

Input and output statements, reading a character: getch(), getche(), writing a character: putchar(), putch(), formatted i/o statements.

❖ **Chapter 5. Decision making, Branching and looping 6Hrs**

Control instructions: decision control structures: if, if-else, nested if, else-if ladder, switch. The goto statement, conditional operator, loops: while, do-while and for loop. Jump statements, nested loops.

❖ **Chapter 6. Arrays 9 Hrs**

Introduction, single dimensional array, two-dimensional arrays, initializing 2-d arrays, multidimensional arrays. Operations on arrays: traversal, insertion and deletion. Searching: linear search & binary search. Sorting: bubble sort, selection sort and insertion Sort.

❖ **Chapter 7. Strings 8 Hrs**

Declaring and initializing string variables, reading string from terminal, writing string to screen, putting strings together. Comparison of two strings, length of a string, copying a string, string operations using library functions & User defined functions. Operations on characters.

❖ **Chapter 8. Functions 5Hrs**

Introduction, types of functions, need for user-defined functions, function call, types of arguments, nesting of functions, a multi function program, recursion, storage classes, passing arrays to functions.

❖ **Chapter 9. Structures and unions: 6Hrs**

Definition and declaration of a structure, assigning and accessing the members of a structure, structure initialization, structure elements in memory, comparison of structure variables, structure with in the structure, array within structures, unions, type def and enum.

❖ **Chapter 10. Pointers 5Hrs**

Advantages of pointers, declaration of pointer variable, pointer expressions, pointers and functions: calling function by value and call by reference, pointers and arrays, array of pointers, pointer to pointer.

❖ **Chapter 11. Files 4Hrs**

Definition, types of files. Creating text file. Modes of opening a file, formatted and unformatted i/o operations, random files.

Reference Books:

1. E. Balaguruswamy : Programming in ANSI C" Tata Mc Graw-Hill
2. Problem Solving with C -PHI(EEE). By - M.T.Somashekara.
3. Kamthane, Programming with ANSI and Turbo C. Pearson Education
4. V. Rajaraman.: "Programming in C", PHI (EEE) (2000)
5. S. ByronGottfried. : "Programming with C", Tata McGraw-Hill(2000)
6. Yashawant Kanetkar : "Let us C"
7. Brain Verminghan & Dennis M. Ritchie "ANSI C Programming" (PHI)
8. Ramkumar & Rakesh Aggarwal "ANSI C Programming" Tata McGraw Hill
9. Kernigham, C Programming Language ANSI C Version. Pearson Education.
10. Venkateshmurthy, Programming Techniques through C. Pearson Education.

Paper: BCACsP1.2 :C PROGRAMMING Lab
Practical

4 Hrs/Week **Total Marks: 50**

1. Write a program to find largest of 3 numbers using if-else statement.
2. Write a program to check whether given character is vowel or not using switch-case.
3. Write a program to find sum of digit of a given number using do-while loop.
4. Write a program to find the factorial of a number.
5. Write a program to generate and print first n fibonacci numbers.
6. Write a program to find whether a given number is prime number or not.
7. Write a program to insert an element into an array.
8. Write a program to delete an element from an array.
9. Write a program to check whether the given matrix is identity or not.

10. Write a program to print the product of two given matrices of n x n.
11. Write a program to check whether a given string is palindrome or not.
12. Write a program to sort the given n names using bubble sort technique.
13. Write a program to search an element from an array using linear search.
14. Write a program to accept a string and reverse it by using pointers.
15. Write a program to swap two integers using call by value and address.

Scheme for Practical Examination

1.	Writing Two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical record	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1.	Internal Assessment for each paper(Theory)	:	10 Marks
2.	Practical Examination of 3 hours duration	:	50 Marks
3.	Theory Examination of 3 hours duration	:	90 Marks
	Total	:	150 Marks

1st Sem BCA

Paper: BCACsT1.3: Operating System

Theory

4 Hrs /Week **Total: 60 Hrs**

❖ **Chapter 1: Introduction** **6Hrs.**

Batch Systems, Concepts of Multiprogramming and Time Sharing, Parallel, Distribute and real time Systems, operating System Structures, Components and Services, System calls, System programs, Virtual machines.

❖ **Chapter 2: Process Management** **9Hrs.**

Process Concept, Process Scheduling, Co-Operating process, Threads, Inter process communication, CPU Scheduling Criteria, Types of Schedulers, Scheduling algorithm, Multiple Processor Scheduling, Real time Scheduling, Algorithm evolution.

❖ **Chapter 3 : Process Synchronization and Deadlocks** **11Hrs.**

The Critical Section Problem, Synchronization hardware, Semaphores, Classical problems of synchronization, Critical regions, monitors, Dead locks– System model, Characterization, Dead lock prevention, avoidance and detection, Recovery from dead lock, Combined approach to deadlock handling.

❖ **Chapter 4: Memory Management** **12Hrs.**

Logical and Physical address space, Swapping, Contiguous allocation, Paging, Segmentation, Segmentation with paging in Mastics and Intel 386, Virtual memory –Demand paging and its performance, Page replacement algorithms, Allocation of frames, thrashing, page size and other considerations. Demand Segmentation.

❖ **Chapter 5 : File Management (Systems, Secondary Storage Structure 8Hrs.**

File Concepts, Access methods, Directory Structure, Protection and Consistency Semantics, File system structure, allocation methods, Free space management, Directory Implementation, Efficiency and Performance, Recovery.

❖ **Chapter 6 : Disk Management (Structure, Disk Scheduling Methods) 7Hrs.**

Disk Structure and Scheduling methods, Disk management, Swap-Space management.

❖ **Chapter 7: Protection and Security** **7Hrs.**

Goals of protection, Domain Protection, Access matrix, Security Problem, Authentication, One time password, program threats, System threads.

Reference Books:

1. Abraham Silberschatz and Peter Baer Galvin, Operating System Concepts, Fifth Edition, Addision-wesley 1999
2. Nutt: Operating Systems,3/e Pearson Education 2004 References:
3. Milan Milonkovic, Operating System Concepts and design, II nd Edition, McGraw Hill1992.
4. Richard Peterson, Linux-The complete reference.
5. Tanenbaum, Operation System Concepts. Pearson Education.

Paper BCACsP1.4: DOS & MS-Office Lab Practical

4 Hrs/Week **Total Marks: 50**

❖ **Disk Operating System (DOS)**

1. Learn internal commands with their syntax

a) cls
b) copy con
c) REN
d) Del
e) MD
f) date
g) time
h) cd
i) rd
j) vol
k) Ver
l) copy

2. Learn External commands with their syntax

a) EDIT
b) FORMAT
c) TREE
d) CHKDSK
e) SORT
f) MORE
g) BACKUP
h) DELTREE
i) XCOPY

❖ **MS Word**

1. Design your College banner.
2. Create a document of your **C PROGRAMMING Syllabus**. Perform the following features: Cut, Copy, Paste, Bold, Italic, Underline, Indentation, Font size, Color change, Paragraph alignment, Line spacing, Bullets and Numbering.
3. Write an appointment letter for Marketing Executive of "ABC Company" using the company's letter head.
4. Using Clip Art & WordArt insert images in your document and design it with text special effects and back ground effects.
5. Write your bio-data using formatting tools – colors, numbers/bullets, alignment, and border.
6. Write a birthday invitation to your friends using mail merge.
7. Create a macro to print your College name "……".
8. Design your college timetable using Table and its formatting features.

❖ **MS Excel**

1. Design your class time table.
2. Prepare a mark sheet of your class subjects.
3. Prepare a salary slip of an employee.
4. Prepare a bar chart & pie chart for the analysis of Election results.
5. Prepare a generic bill of a super Market.
6. Work on the following exercise on a Workbook:
   a) Copy an existing Sheet
   b) Rename the old Sheet
   c) Insert a new Sheet into an existing Workbook
   d) Delete the renamed Sheet.
7. Prepare an attendance sheet of 10 students for any 5 subjects of your syllabus. Calculate their total attendance, total percentage of attendance of each student & average of attendance. [Hint: Use excel in-built functions.]
8. Create a worksheet on students list and perform the following database functions:-
   a) Sort data by name
   b) Filter data by class
   c) Subtotal of No. of students in a class.

❖ **MS-Power Point:**

Creating new slides, formatting slide layout, slide show & sorter, inserting new slide, slide no., date, time, chart and other tool operations.

❖ **Internet concepts:**

To create an email-id, To compose and send a mail, To forward a mail and to reply for a mail, To send a mail with an attachment, To download the attached document of a mail received, To send a mail to a large number of recipients using cc and bcc options, To search a thing using a search engine, To verify a university /college details by opening their websites, To upload your resume with any one job portal.

Scheme for Practical Examination

1.	Writing Two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical record	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1.	Internal Assessment for each paper(Theory)	:	10 Marks
2.	Practical Examination of 3 hours duration Marks	:	50
3.	Theory Examination of 3 hours duration Marks	:	90
	Total	:	150 Marks

1st Sem BCA

Paper: BCACs1.5 Computer Hardware & Network Theory

4 Hrs/week **Total Hrs: 60**

❖ **Chapter 1: Introduction to computers** **12 Hrs**

Introduction, History of computer, Block diagram of computer, Generation of computer, Classification of computers (based on working principle, size and capability), Characteristics of computer, Applications of computer. Human Computer Interface: Types of software, Operating system as user interface, utility programs, Number System.

❖ **Chapter 2 : Input & Output Devices** **12 Hrs**

Components of computer system, Input Devices : wired/wireless, Keyboard, Mouse, Joystick, Scanner, Digitizers, Light pen, Touch screen, Barcode scanner, Output Devices, Monitor(CRT,LCD,LED), Printer, Dot Matrix, Inkjet, Laser, Thermal, Plotter, Barcode Printers, Sound devices, Speaker, Headphone, Bluetooth, Dongle.

❖ **Chapter 3 : Memory Management Techniques** **10 Hrs**

Types and characteristics, Classification, Semiconductor, Magnetic, Optical ROM and its types, RAM and its types: SDRAM, EDORAM, DDR Series, Flash RAM. Secondary Memory, Hard Disc Drive, Floppy Disc, CDROM, DVD, Pen Drive, flash memories: Mini/micro , SD Card Formatting and Utility Tools.

❖ **Chapter 4 : Computer Organization and Architecture:** **6 Hrs**

C.P.U., registers, system bus, main memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.

❖ **Chapter 5: Computer Networks** **10 Hrs**

Introduction to computer network, data communication, components of data communication, data transmission mode, LAN (**LAN Topologies**: Ring, bus, star, mesh and tree topologies), MAN, WAN.

❖ **Chapter 6 : Transmission Media & Network devices** **10 Hrs**

Introduction, Guided Media: Twisted pair, Coaxial cable, Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite. **Network Devices:** NIC, repeaters, hub, bridge, switch, gateway and router. OSI, TCP/IP, layers and functionalities.

Reference Books:

1. Computer Fundamentals: N. Mithili Devi and E. Padma Sri, SKYWARD Publishers.
2. Introduction to computer concepts: Pearson publication.
3. Computer Fundamentals: Anita Goel, Pearson publication.

4. Fundamentals of Computers - V. Rajaraman.: PHI (EEE)
5. Network Flows: Theory, Algorithms, and Applications by Ravindra K. Ahuja, Thomas L. Magnanti, James B. Orlin. 1993.
6. Computer Networks 2013by Andrew S. Tanenbaum

Paper BCCsP1.6 : Computer Hardware Lab Practical

4 Hrs/Week **Total Marks: 50**

1. Draw the block diagram of the computer and tabulatly mention the basic configuration of present PC.
2. Study the peripheral device (Keyboard, Mouse, Monitor, Printer).
3. Study of the CPU cabinet with its front and back view (Brief Explanation of SMPS).
4. Study the overview of Motherboard and Microprocessor.
5. To study the Memory
   - RAM
   - ROM
   - DDR Series
   - Hard disk, CD and DVD
6. Study the different types of ports, Cable and Connectors
   - Serial and Parallel port
   - PS/2 Port
   - VGA Port
   - DVI Port
   - Audio Ports
   - Expansion Slots
7. DOS based practical Internal and External commands.
8. Desktop and control panel settings of windows operating system.
9. Assembling and disassembling the system hardware components of the personal computer
10. Format the System. Installation of software and anti-virus software.

Scheme for Practical Examination

1.	Writing Two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical record	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1.	Internal Assessment for each paper(Theory)	:	10 Marks
2.	Practical Examination of 3 hours duration	:	50 Marks
3.	Theory Examination of 3 hours duration	:	90 Marks
	Total	:	150 Marks

2nd Sem BCA

Paper: BCACsT2.1 DATABASE MANAGEMENT SYSTEMS

4 Hrs /Week **Total: 60 Hrs**

❖ **Chapter 1. Introduction** **6Hrs**

Basics of database, traditional file oriented approach, database and database users, characteristics of the database approach, different people behind DBMS, implications of database approach. Advantages and disadvantages of using DBMS, database administrator (DBA), when not to use a DBMS.

❖ **Chapter 2. Database System Concepts and Architecture** **5Hrs**

Introduction, data models, schemas, and instances. Different types of data models, DBMS architecture (logical and physical) and data independence. Database languages, DBMS interfaces. The database system environment, distributed DBMs, client-server architecture, classification of database management systems.

❖ **Chapter 3. Data Modeling Using the Entity-Relationship Model** **5Hrs**

Introduction, high level conceptual data models for database design with an example. Entity and attributes, types of attributes, entity types, entity sets and keys, ER model concepts, notation for ER diagram, E.F. Codd rules, cardinality. Abstraction and aggregation.

❖ **Chapter 4. Functional Dependencies and Normalization** **7Hrs**

Introduction, relational model constraints, basic terms, database design, database anomalies, informal design guidelines for relational schemas, decomposition, functional dependencies, normal forms based on primary keys, normalization: first, second and third normal forms and Boyce-Codd normal form.

❖ **Chapter 5. Relational Database Language** **10Hrs**

Introduction, differences between DBMS and RDBMS, basic terminologies used in RDBMS, introduction to SQL, advantages and disadvantages, data types, types of SQL statements, DDL statements: create, alter, drop, truncate , DML statements : insert, delete ,update and Select. DCL statements: commit, rollback, save point and DCL statement: grant and revoke queries on the database, operators used in SQL, distinct clause, set operators, SQL alias, SQL dual table, SQL functions, order by and having clause, joins, sub queries, indexes and views in SQL.

❖ **Chapter 6. Relational Data Model and Relational Algebra** **5Hrs**

Introduction to the relations model concepts. Relational model: constraints and relational database schema, operations on relations: retrieval and update.

Relational algebra: types of operations on relational algebra, unary operations: select and project, binary relational operations: union, intersect and minus, relational algebra on set theory: Cartesian product, additional relational operations aggregate functions and grouping,

examples of queries in the relational algebra. Relational database design using E R diagram.

❖ **Chapter 7: PL/SQL** **12 Hrs**

Introduction, PL/SQL architecture, features of PL/SQL, advantages of PL/SQL over SQL, PL/SQL blocks: named and unnamed, comments in PL/SQL, PL/SQL language fundamentals, structure of PL/SQL program, display output from PL/SQL, PL/SQL execution, overview of PL/SQL control statements : conditional, iterative and sequential statements , procedures and functions, packages, exception handling, database triggers, cursors. Programs on named and unnamed blocks.

❖ **Chapter 8 : Record Storage and Primary File Organization** **5Hrs**

Introduction, buffering of blocks, operations on files, file organization: files of unordered records: heap files, files of ordered records (sorted files)), hashing techniques, other primary file organization, parallelizing disk access using RAID technology.

❖ **Chapter 9:Transaction Processing Concepts:** **5Hrs**

Introduction, transaction and system concepts, desirable properties of transaction, transaction support in SQL, locking techniques for concurrency control, concurrency control techniques.

Reference Books:

1. Elmasri and Navathe, Fundamentals of Database Systems (4th Edition), Pearson Education, 2003
2. Sundrraman, Oracle 9i programming A Primer, 1/e Pearson Education.
3. Kahate, Introduction to Database Management System, Pearson Education 2004.
4. Abrahamsi, Silberschat, Henry. F. Korth, S. Sudarshan, Database System Concepts,Mc.graw hill.
5. Jefry. D. Ullman, Principles of database system.
6. Oracle Press" ORACLE-Complete reference
7. C.J. Date, Introduction to database systems, Sixth Edition, Addison Wesley, 1995.
8. Raghu Ram Krishan, Database Management Systems, Second Edition,. Mc. Graw Hill, 2000

Paper: BCACsP2.2 DBMS Lab
Practical

4 Hrs/Week **Total Marks: 50**

1. **The Student detail database has a table with the following attributes. The primary keys are underlined.**
   Student (regno number, name varchar2, dob date, marks number)
   a) Create the above table.
   b) Remove the existing attribute marks from the table.
   c) Change the data type of regno from number to varchar2.
   d) Add a new attribute phno to the existing table.
   e) Enter 5 tuples into the table.
   f) Display the tuples in table

2. **A Library database has a table with the following attributes. Library (bid number, title varchar2, author varchar2, publisher varchar2, yearof_pub number, price number)**
   a. create the above table.
   b. Enter 5 tuples into the table.
   c. Display all the tuples from the table.
   d. Display different publishers from table.
   e. Arrange the tuples in the alphabetical order of book title.
   f. List the details of all books whose price range between 100rs and 300rs.

3. **The Emp salary database of an organization has a table with the following attributes.**
   Empsal (Empcode number, Ename varchar2, dob date, dept varchar2, salary number(10,2)
   a. Create the above table.
   b. Enter 5 tuples into the table.
   c. Display the no of employees working in each dept.
   d. Find sum of the salaries of all employees.
   e. Find highest and lowest salary of all employees.
   f. Find the sum and average salaries of employees of a particular department.
   g. Increase the salary of those employees working for the "computer science" dept.

4. **An Inventory database has the following table.**
   Items (itemcode number, name varchar2, price number)
   Purchase (itemcode number, qty number)
   a) Create the tables with the above attributes.
   b) Enter 5 tuples into the tables.
   c) List the items purchased.
   d) List the items which are not purchased by anyone.

5. **Consider the Insurance database given below. The primary keys are underlined and data types are specified.**
   Person (driverid varchar2, name varchar2, address varchar2)
   Car (regno varchar2, model varchar2, year number)
   Owns (driverid varchar2, regno varchar2)

Accident (reportno number, accdate date, location varchar2)
Participated (driverid varchar2, regno varchar2, reportno number, dmgamt number).

a) Create all tables.
b) Enter at least 5 tuples for each table.
c) Update the damage amount for each car accident.
d) Add a new accident to the database.
e) Find the total no of people who owned cars that were involved in accidents in the particular year.
f) Find the no of accidents in which cars belonging to a specific model were involved.

6. A Bank database has 2 tables Customer and Account.
Account (accno number, acctype varchar2, branch varchar2, accstatus varchar2, chequef varchar2)
Customer (custno number, cname varchar2, city varchar2, accno number, balance number)

a) Create the above tables and specify the primary and foreign keys.
b) Enter 5 tuples for each table.
c) List the customers from "Bangalore" who have been cheque facility.
d) List all the customers whose balance is > 3000 and have an active account.
e) Find the current outstanding balance amount of branch "malleswaram".

7. Consider the following database of Student enroll has the following tables with attributes.
Student (regno number, name varchar2, major varchar2, dob date)
Course (cno number, cname varchar2, dept varchar2)
Enroll (regno number, cno number, sem number, tmarks number)
Tbook (bkno number, title varchar2, publisher varchar2, author varchar2) Bk_adpt (cno number, bkno number, sem number)

a) Create all the tables.
b) Enter 5 tuples for each table.
c) Insert a record into the tbook table.
d) Insert a record into bk_adpt table.
e) List the students registered but not enrolled.
f) List the books which have been adopted.

8. Consider the following an Order processing data base application in a company.
Customer (custid number, cname varchar2 ,city varchar2)
Corder (orderno number,ordate date, custid number, oramt number)
Item (itemno number, name varchar2, price number)
Oritem (orderno number, itemno number, qty number)
Warehouse (whno number, city varchar2)
Shipment (orderno number, whno number, shipdate date)

a) Create all the tables.
b) Enter 5 tuples for each table.
c) List the orderno for the order that were shipped from the all the ware houses that the company has in a specific city.
d) Demonstrate the delete of itemno 21 from item table and make that field "null" in the or item table.

9. **Write a PL/SQL Program to find largest of 2 numbers using if statement.**
10. **Write a PL/SQL Program to find the sum of first 10 natural numbers using Loop structure.**
11. **Write a PL/SQL Program to find factorial of a given number.**
12. **Write a PL/SQL Program to Create a Procedure to add 2 numbers.**

Scheme for Practical Examination		
1. Writing Two programs	:	10 Marks
2. Execution of two programs	:	30 Marks
3. Practical record	:	05 Marks
4. Viva Voce	:	05 Marks
Total	:	50 Marks

Note		
1. Internal Assessment for each paper(Theory)	:	10 Marks
2. Practical Examination of 3 hours duration	:	50 Marks
3. Theory Examination of 3 hours duration	:	90 Marks
Total	:	150 Marks

2nd Sem BCA
Paper: BCACsP2.3 DIGITAL ELECTRONICS
Theory

4 Hrs /Week **Total: 60 Hrs**

❖ **Chapter 1:Introduction:** **6 Hrs**

Electronics and its components-Resistors, capacitors, diodes transistors , Analog and Digital electronics and its application, Wave forms types and its characteristics, Logic-families-Scale of integration, digital IC's, classifications, DTL, TTL, ECL, MOS, CMOS, mention features: speed of operation, power dissipation, propagation delay, fan-in, fan-out.

❖ **Chapter 2: NUMBER SYSTEMS AND BOOLEAN ALGEBRA** **10 Hrs**

Introduction to number systems – positional and non-positional, base of a number system.. Decimal number system: definition, digits, binary number system: bit, byte, conversions: binary to decimal and decimal to binary. Octal number system: conversion from octal to decimal, decimal to octal, octal to binary and binary to octal. Hexadecimal number system: conversions- decimal to hexadecimal, hexadecimal to decimal, hexadecimal to binary, binary to hexadecimal, octal to hexadecimal , hexadecimal to octal. Binary arithmetic operations - binary addition, subtraction, multiplication and division (only integer part). 1's and 2's complement – 2's complement subtraction (only signed numbers).

Binary codes: BCD code, 8421 code, examples and applications. **Gray code** - Conversions - Gray to binary and Binary to Gray, application of gray code (Mention only). **Excess – 3 code** - Self complementing property and applications. Definition and nature of ASCII code. Introduction to **error detection and correction code**, parity check.

❖ **Chapter 3: BOOLEAN ALGEBRA** **12 Hrs**

Laws and Theorems. AND, OR, NOT Laws, Commutative law, associative law, distributive law.
Demorgan's theorems – Statements, proof using truth tables; simplification of Boolean expressions using Boolean laws. Definition of product term, sum term, minterm, maxterms, SOP, standard SOP, POS and Standard POS. Conversion of Boolean expression to standard SOP and standard POS forms. Karnaugh maps- Definition of Karnaugh map, K- map for 2, 3 and 4 variables. Conversion of truth tables into k-map, grouping of cells, redundant groups and don't care conditions. Karnaugh map technique to solve 3 variable and 4 variable expressions. Simplification of 3 and 4 variable Boolean expression using K-maps (SOP only).

❖ **Chapter 4: LOGIC GATES AND COMBINATIONAL LOGIC CIRCUITS** **16 Hrs**

AND gate: definition, symbol, truth table, timing diagram, Pin diagram of IC 7408. OR gate: definition, symbol, truth table, timing diagram, Pin diagram of IC 7432. NOT gate: definition, symbol, truth table, timing diagram, Pin diagram of IC 7404. NAND gate: Definition, symbol, truth table, Pin diagram of IC 7400. NOR gate: Definition, symbol, truth table, timing diagram, Pin

diagram of IC 7402. Exclusive OR gate: definition, symbol, truth table, timing diagram, applications, Pin diagram of IC 7486. Exclusive NOR gate: definition, symbol, truth table, timing diagram.

Combinational logic circuits: Definition, applications. half adder: symbol, logic circuits using XOR and basic gates, truth table. Full adder: symbol, logic circuits using XOR and basic gates, truth table. Half subtractor: symbol, logic circuits using XOR and basic gates, truth table. Full subtractor: symbol, logic circuits using XOR and basic gates, truth table. Adder - Subtractor: Logic circuit using IC 7483, IC 7486. Parallel Adder: 4 - bit parallel binary adder, BCD adder using IC 7483.

Multiplexer: Logic symbol, 4:1 and 8:1 multiplexers-logic circuits using gates, truth table and applications.

De-Multiplexer: Logic symbol, 1:4 and 1:8 de-multiplexers: logic circuits using gates, truth table and applications.

Decimal to BCD Encoder: Logic symbol, truth table and applications.

BCD to decimal Decoder- logic symbol, IC 7445-Pin diagram, truth table and applications .

❖ **Chapter 5: SEQUENTIAL LOGIC CIRCUITS 16 Hrs**

Importance of clock in digital circuit and **Introduction to flip flop**. Difference between latch and flip-flop. Qualitative study of level and edge triggering. RS latch / unlocked, symbol and truth table. **RS flip-flop** using NAND gate, symbol, truth table and timing diagram. **D flip-flop**- Logic symbol, RS flip-flop as a D flip flop, truth table and timing diagram. **J-K flip-flop**- Symbol, truth table, Realization of JK flip-flop using NAND gates, working, and timing diagram. Race around condition, preset and clear inputs. **T flip flop** - Logic symbol, JK flip flop as a T flip-flop, truth table and timing diagram. **JK Master Slave flip flop**: Logic circuit, truth table and timing diagram, advantage of M/S flip flop.

Registers: Definition, types of registers - Serial in serial out, Serial in parallel out, Parallel in serial out, Parallel in parallel out shift register (Block diagram representation for each), truth table, timing diagram and speed comparison.

Reference Books:

1. Principles of Electronics by V. K Mehta by S Chand.
2. Digital Principles and Applications by Albert Paul Malvino and Donald P. Leach, Fourth Edition, TMH .
3. Digital Electronics: An Introduction to Theory and Practice by William H Gothmann, 2nd Edition, PHI.
4. Morris Mano, “Digital Logic and Computer Design”, PHI Publications.
5. R. P. Jain, “Modern Digital Electronics”, TMH, 3rd Edition.
6. Digital Fundamentals. Floyd, 3rd Edition.

BCACs2.4 Digital Electronics Lab
Practical

4Hrs/Week **Total Marks: 50**

1. Study of logic gates: AND, OR, NOT, NAND, NOR, XOR using respective ICs
2. Realization of AND,OR and NOT gates using IC 7400.
3. Realization of AND,OR and NOT gates using IC 7402.
4. Design and realization of Half Adder/Subtraction using NAND Gates.
5. Design and realization of Full Adder using Logic Gates.
6. Design and realization of 4 bit Adder/subtraction using IC 7483.
7. Design and realization of BCD Adder using IC7483.
8. Realization of R-S and D flip-flop using NAND gates.
9. Realization of J-K flip-flop using IC 7400 and 7410.
10. Realization of T and D flip-flops using IC 7476.
11. Implementation of SISO Shift Registers using flip flops(IC 7476).
12. Implementation of SIPO Shift Registers using flip flops(IC 7476).
13. Implementation of PISO Shift Registers using flip flops(IC 7476).
14. Implementation of PIPO Shift Registers using flip flops(IC 7476).
15. Study of Multiplexer by Using 74153

Scheme for Practical Examination

1.	Writing Two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical record	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1.	Internal Assessment for each paper(Theory)	:	10 Marks
2.	Practical Examination of 3 hours duration	:	50 Marks
3.	Theory Examination of 3 hours duration	:	90 Marks
	Total	:	150 Marks

2nd Sem BCA

Paper : BCACsT2.5 – Data Structure Using C

4 Hrs/WEEK **Total: 60Hrs.**

❖ **Chapter 1 : Introduction to Data Structure** **6 Hrs**

Definition, classification of data structures: operations on data structure. Meaning of static and dynamic memory allocation, memory allocation functions: malloc(), calloc(), realloc() and deallocation of memory- free().

❖ **Chapter 2: Linked Lists** **10 Hrs**

Definition, components of linked list, representation of linked list, advantages and disadvantages of linked list. Types of linked list: singly linked list, doubly linked list, circular linked list. Operations on singly linked list: creation, insertion, deletion and display.

❖ **Chapter 3: Stacks** **12 Hrs**

Definition, array representation of stack, stack operations, array implementation of stacks and linked implementation of stacks. Infix, prefix and postfix notation, conversion of an arithmetic expression from infix to prefix, infix to postfix and application of stacks- recursion, evaluation of postfix expression, parenthesis evaluation, towers of hanoi.

❖ **Chapter 4: Queues** **7 Hrs**

Definition, array representation of queue, types of queues: simple queue, circular queue, double ended queue, priority queue. Array implementation of queue and linked implementation of queue.

❖ **Chapter 5: Graphs** **5 Hrs**

Introduction to graphs, vertex, edge, simple graph, general graph, self loop, parallel edges, degree of a node, walk, path, cycle, null graph, complete graph. Array representation and linked representation of graph.

❖ **Chapter 6: Trees** **10 Hrs**

Definition: Tree, Binary tree, Complete Binary tree, Binary Search Tree.
Terminology: degree of node, level, depth, height, root node, internal node, leaf node, siblings, parent node, ancestors of a node, forest.
Binary Tree: Array representation of Binary tree, Linked representation of Binary tree, creation of BST, tree traversal techniques: pre-order, in-order and post-order traversal. Introduction to AVL tree.

❖ **Chapter 7: Searching & Sorting:** **10 Hrs**

Searching: Definition, Sequential & binary search.
Sorting: Definition, types: Merge sort, Quick sort, Heap sort.

Reference Books:

1. Horowitz, sahni, Anderson-Freed: Fundamentals of Data Structures in C, 2nd Edition, Unversities Press, 2007.
2. Debasis Samanta: Classics Data Structure, 2nd Edition, PHI, 2009

3. Robert Kruse & Bruce Leung: Data Structures & Program Design in C, Pearson Education, 2007.
4. Systematic approach to Data Structures Using C by Padma Reddy, Sri Nandi Publication, Bangalore.
5. Data Structures by Tremblay and Sorrenson

BCACsP2.6: Data Structures Using C Practical

4 Hrs/Week **Max. Marks: 50**

1. Write a program to implement nCr using recursion.
2. Write a program to illustrate Towers of Hanoi problem for n disks.
3. Write a recursive program to print Fibonacci series of n number.
4. Write a program to search the given element using sequential search.
5. Write a program to search the given element using binary search.
6. Write a program to sort the given n elements using Max Heap sort.
7. Write a program to sort the given n elements using Merge sort.
8. Write a program to sort the given n elements using Quick sort.
9. Write a program to insert an element into a singly linked list.
10. Write a program to delete an element from a singly linked list.
11. Write a program to implement stacks using arrays.
12. Write a program to implement stacks using linked lists.
13. Write a program to convert infix expression into post fix expression.
14. Write a program to implement ordinary queues using arrays.
15. Write a program to implement queues using linked lists.
16. Write a program to implement circular queue using array .
17. Write a program to construct a binary search tree and perform tree traversal.

Scheme for Practical Examination

1.	Writing Two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical record	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1. Internal Assessment for each paper(Theory)	:	10 Marks
2. Practical Examination of 3 hours duration	:	50 Marks
3. Theory Examination of 3 hours duration	:	90 Marks
Total	:	150 Marks

3rd Sem BCA

Paper: BCACsT3.1 Computational Numerical Techniques

4 Hrs /Week **Total: 60Hrs.**

❖ **Chapter 1 : Matrix:** **12 Hrs**

Introduction, Recapitulation, Determinants, Adjoint of a Matrix, Inverse of a square Matrix, Solution of system of linear equations by Cramer's rule, Solution of linear system of equations using matrix method, Eigen values and Eigen Vectors, Cayley-Hamilton Theorem.

❖ **Chapter 2 : Algebraic Structure:** **8 Hrs**

Introduction, Binary operation (Binary composition), Definition of a Group, Modular Systems, Properties of Groups (without proof), Sub groups.

❖ **Chapter 3 : Mathematical logic:** **8 Hrs**

Introduction- prepositional calculus –Basic logical operations- Tautologies-Contradiction-Argument-Method of proof- Predicate calculus.

❖ **Chapter 4 : Differential Calculus:** **8 Hrs**

Introduction, recapitulation, calculation of the n^{th} derivative of standard functions, Leibniz's theorem(Without Proof).

❖ **Chapter 5 : Numerical Analysis. Roots of equations:** **12 Hrs**

Locating roots of f(x)=0, Bisection method and convergence analysis, Newton's method and convergence analysis, failure of Newton's method due to bad starting points, modification of Newton's method to find multiple roots, Newton's method for system of non-linear equations, secant method and convergence analysis.

❖ **Chapter 6 : Interpolation and numerical differentiation** **8 Hrs**

Polynomial and its existence, Lagrange and Newton form of interpolating polynomial, divided difference and recursive property, inverse interpolation , error in polynomial interpolation, first and second derivative formulae via interpolation polynomial

❖ **Chapter 7 : Numerical integration:** **4hrs**

Trapezoidal, Simpson's 1/3 and 1/8 rules and adaptive Simpson rules and Error analysis.

Reference Books:

1. B.S.Grewal, Higher engineering mathematics, 43rd Edition, Khanna Publishers.
2. Jain, Iyengar & Jain, Numerical methods for scientific & engineering computation, New Age International, 2003.

3. A.R.Vasishtha & A.K.Vasishta, Trigonometry & Algebra, Krishna's series, 2009.
4. Discrete Mathematics Structures with Applications to computer science - J. P Tremblay R Manohar – Mc Graw Hill International Edition.
5. Numerical Mathematics & computing, Cheney & Kincaid, Cengage learning, 2012.

BCACsP3.2 : Numerical Analysis Lab Practical

4 Hrs/Week **Max. Marks : 50**

1. Write a program to find the roots of an equation f(x)=0 using Bisection method.
2. Write a Program to find the simple/multiple roots of f(x)=0 using Newton-Raphson method.
3. Write a program to find the roots of system of non-linear algebraic equations using Newton's method.
4. Write a program to find the roots of f(x)=0 using Secant method.
5. Write a program to find the integral of a function using Trapezoidal rule.
6. Write a program to find the integral of a function using Simpson's $1/3^{rd}$ and $3/8^{th}$ rule using switch case.
7. Write a program to find the integral of a function using adaptive Simpson method.
8. Write a program to find the value of a function at a point using Lagrange's interpolation.

Scheme for Practical Examination

1.	Writing Two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical record	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1.	Internal Assessment for each paper(Theory)	:	10 Marks
2.	Practical Examination of 3 hours duration	:	50 Marks
3.	Theory Examination of 3 hours duration	:	90 Marks
	Total	:	150 Marks

3rd Sem BCA

Paper: BCACs3.3 – Object Oriented Programming Using C++

4 Hrs /Week **Total: 60 Hrs**

❖ **Chapter 1: Introduction to C++** **4 Hrs**

Procedure oriented, object oriented programming, Difference between POP and OOP, History of C++, Basic concepts of OOPs. Applications of OOPs.

❖ **Chapter 2: Features of C++** **10 Hrs**

C++ tokens, C++ operators, Structure of C++ program, Compilation and execution of C++ program, getline(), data types, Scope resolution operator, New and delete operator, Manipulators, C++ comments, Creation of variable in C++, Difference between C and C++. Command Line Arguments. Control Statements: Decision making statements, Looping statements, Jump statements. Arrays: Definition, declaration, initialization, types.

❖ **Chapter 3: Functions** **8 Hrs**

Definition, Types of functions, Advantages and disadvantages, Basic concepts of functions, Recursive function, Difference: call by value and call by address, Passing structure variables to function, Passing arrays to function, Default arguments, Function overloading.

❖ **Chapter 4: Class and objects** **10 Hrs**

Class, Difference between structure and class, Access specifiers, Object: Creation, accessing member functions, Defining member function, Array of objects, Constructors: Constructor, Types & characteristics of constructors, Destructor, Friend function: friend function & characteristics.

❖ **Chapter 5: Operator overloading** **7 Hrs**

Definition, characteristics, Syntax of operator overloading function, rules for operator overloading, overloading unary ++ and binary +, *, == operator, data conversion and type casting with examples. Operators which cannot be overloaded.

❖ **Chapter 6: Inheritance** **7 Hrs**

Definition, Concept of inheritance, Access control/Visibility modes of inheritance, Types, Constructor and destructor in derived classes, Nested class, Advantages of inheritance.

❖ **Chapter 7: Polymorphism** **5 Hrs**

Definition, Types of polymorphism, Virtual function, Rules for virtual function, pure virtual function, Abstract class. Method Overriding. 'this' keyword.

❖ **Chapter 8 : Templates & Exception Handling** **5 Hrs**

Definition, Template Functions, Template Class, Exception Handling: Exception, types, Mechanism-try, catch, throw.

❖ **Chapter 9 : Streams & Files** **4 Hrs**

Stream, Stream class hierarchy, File, File class Hierarchy, Basic file operations, File opening modes, File pointer:Seekg(), tellg(), seekp(), tellp(), End-of-file.

Reference Books:

1. Lippmann: C++ primer,3/e Pearson Education

2. Object oriented programming with C++, E.Balagurusamy, Tata McGraw Hill publications.

3. Object-Oriented Programming with C++ by M.T. Somashekara, D.S. Guru, H.S. Nagendraswamy and K.S. Manjunatha, PHI, New Delhi.

4. The C++ Programming language, Strousstrup, Pearson edition, 3rd edition.

5. object-oriented programming using C++, Dr.M.A.Rama, fourth edition, Subhas stores

Paper BCACsP3.4: C++ USING OOPS Lab
Practical

4 Hrs/Week **Max.Marks: 50**

1) Write a program to implement digital clock.
2) Write a program to calculate area & circumference of the circle using inline function.
3) Write a program to find the factorial of a given number using command line arguments.
4) Write a program to prepare a shopping list using array of objects.
5) Write a program to find the maximum of two numbers using friend function.
6) Write a program to swap two numbers using copy constructor.
7) Write a program to find maximum of two numbers for different data types using template function.
8) Write a program to write & read the data on file.
9) Write a program to perform bank transaction to find the total balance of amount of savings account & current account using friend function.
10) Write a program to print the sum of two complex numbers using friend function.
11) Write a program to perform addition of two matrices using + operator overloading.

12) Write program to perform multiplication of two matrices using * operator overloading.
13) Write a program to compare two given strings using == operator with friend function.
14) Write a program to concatenate two given strings using + operator with friend function.
15) Write a program to create student report using inheritance technique.
16) Write a program to implement area of geometrical figures (circle & square) using pure virtual function.

Scheme for Practical Examination

1.	Writing two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical record	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1.	Internal Assessment for each paper(Theory)	:	10 Marks
2.	Practical Examination of 3 hours duration	:	50 Marks
3.	Theory Examination of 3 hours duration	:	90 Marks
	Total	:	150 Marks

3rd Sem BCA

Paper: BCACsT3.5 INTERNET PROGRAMMING

Theory

4 Hrs/week **Total Hours: 60 Hrs**

❖ **Chapter 1 : Fundamentals of web** **8 Hrs**

Internet, Intranet, WWW, web browsers , web servers, Search engines, DNS, URLs, MIME, HTTP, CGI, Internet Security.

❖ **Chapter 2 : Introduction to HTML** **8 Hrs**

Introduction, History and versions of HTML, Advantages & Disadvantages of HTML , XHTML - Differences between HTML and XHTML.
Advantages of XHTML over HTML, Basic structure HTML comments, Standard XHTML document structure, XHTML Doc Types, Syntax and Rules of XHTML,

❖ **Chapter 3 : Elements of HTML documents:** **10 Hrs**

Basic text markup: Paragraphs <p>,Headings <h1>……<h6>,preserving white space <pre> tag, Line break
,<hr>,Presentation elements:<i>,<b>,<u>,<sub>,<sup>,<s>, <tt>, <big>, <small>, Phrase elements:,,<meta> tag, Character entities. Example Programs

❖ **Chapter 4 : Lists , Images and Hyper Linking in HTML:** **12 Hrs**

Lists: Ordered lists, Unordered lists and Definition lists, adding images using <img >tags & setting an image as background, embedding a multimedia on to a web page**:** Inserting audio files and video files, <marquee> behavior, Types of Hyper links: Internal Links, Local links, External Links, anchor <a> tag, Links with text and images.

❖ **Chapter 5 : Tables and Forms in HTML:** **12 Hrs**

Creating and managing tables: Defining border, <tr>,<th> and <td> tags, cell spacing and cell padding attributes, Rowspan and colspan attributes, <Caption> tag and its attributes. Managing Forms: Creating interactive forms, Form controls, Menus and buttons, Action controls: submit and reset. Using Frames :< frameset> and <frame>, Nested frames.

❖ **Chapter 6: XML** **10Hrs**

XML :XML basics – Introduction – need for XML – Advantages – Working with an XML Document – Structure of an XML Document – DTD- XML Working with XML Schema - Declaring Attributes – XML namespaces – Reusing Schema Components – Grouping elements and attributes.
Introduction – CSS – eXtensible Style Sheet language – Formatting Data based on controls – Displaying data in a Tabular Format.

Reference Books:

1. Robert W.Sebesta: Programming the World Wide Web, 4th Edition, Pearson Education, 2008 (chapters 1 to 9)
2. Web programming: Srikanth S, Skyward Publishers.

BCACsP3.6 - HTML & XML Lab

Practical

4Hrs/Week **Max.Marks: 50**

1. Write a HTML code to create simple Web page to display your college information.
2. Write a HTML code to display different levels of headings.
3. Write a HTML code to illustrate all text formatting tags.
4. Write a HTML code to create different types of ordered lists.
5. Write a HTML code to display the glossary of any 5 HTML tags using definition lists.
6. Write a HTML code to insert an image of 'Tim Berners Lee' and display his Bio data.
7. Write a HTML code to embed multimedia on to a web page.
8. Write a HTML code to create text and images as links.
9. Write a HTML code to create your class time table.
10. Write a HTML code to create a form to accept student details.
11. Write a HTML code to display a menu of twelve months.
12. Write a HTML code to create nested frames.
13. Writing XML web Documents which make use of XML Declaration, Element Declaration, Attribute Deceleration.
14. Usage of Internal DTD, External DTD, Entity Declaration.

Scheme for Practical Examination

1.	Writing Two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical record	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1.	Internal Assessment for each paper(Theory)	:	10 Marks
2.	Practical Examination of 3 hours duration	:	50 Marks
3.	Theory Examination of 3 hours duration	:	90 Marks
	Total	:	150 Marks

4th Sem BCA

Paper: BCACsT4.1 Computer Networks and Data Communications

4Hrs/Week **Total :60 Hrs**

❖ **Chapter 1 : DATA COMMUNICATIONS : 8 Hrs**

Networks – Components: Data Representation, need of network, services. Network models-peer to peer, client server, distributed. Application of network and criteria, Types of connections: Topologies-mesh, star, bus, ring, Categories of Networks -LAN, WLAN,MAN, WAN .

❖ **Chapter 2: Protocols and standards 12 hrs**

Protocols and standards – standards Organizations – internet standards – internet administration - The OSI model and the TCP/IP protocol suit : the OSI model – layers in the OSI model – TCP/IP protocol suit – addressing – IP versions

❖ **Chapter 3 : Application layer 10Hrs**

Domain Name Space (DNS) – SMTP – FTP –TFTP- HTTP- TelNet- Architecture-Remote Login – WWW –Introduction to Socket- Introduction to Security –cryptography. The Future of TCP / IP Adress Classes, IP-IPV6 format.

❖ **Chapter 4 : Data link layer , Network layer & Transport Layer 20 Hrs**

Error detection and correction –Parity checking,Checksum,CRC, Hamming Codes,Flow-control and error control- Sliding window – HDLC-LAN – Ethernet IEEE 802.3 – IEEE 802.4 – IEEE 802.5 – IEEE 802.11 – FDDI – SONET – Bridges.

Network layer-Internetworks – Packet switching and datagram approach – IP addressing methods – Subnetting – Routing-Routing model , Algorithm– Routing table – Routers.

Transport layer: Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) Transmission Control Protocol (TCP) –Port Numbers– Congestion Control – Quality of Services (QOS)

❖ Chapter 5 : Modern Wireless Communication Systems 10 Hrs

Wireless Networks Generation -Wireless Transmission Protocols- Wired Vs Wireless Networks Present Day Mobile Communication-The Cellular Fundamentals-Transmitter and Receiver Techniques

Reference Book

- TCP/IP Protocol Suit by Behrouz A. Forouzan Tata McGraw-Hill Third Edn.
- Mobile computing by Rajkamal, Oxford University Press
- Jochen Schillr - Mobile Communication, Addison Wesley, 2000.
- Behrouz A. Forouzan, ―Data communication and Networking‖, Tata McGraw Hill, 2004.
- Andrew S. Tanenbaum, ―Computer Networks‖, 4th Edition, Prentice Hall of India, 2003.
- Douglas E.Comer, "Internetworking with TCP / IP – Principles, Protocols and Architectures, Fourth Edition, Prentice – Hall of India Private Limited, 2002.

BCACsP4.2 - Static Website Project Lab Practical

4 Hrs/Week **Max.Marks: 50**

Students are expected to develop a static website project for the above mentioned lab. Students can carry out the project in a group /team consisting of not more than 4 students. The entire project to be submitted by each group/team with some related entity information about static website

Note: minimum 8 web pages including all the basic html tags.

Scheme for Practical Examination		
1. Writing Two programs	:	10 Marks
2. Execution of two programs	:	30 Marks
3. Practical record	:	05 Marks
4. Viva Voce	:	05 Marks
Total	:	50 Marks

Note		
1. Internal Assessment for each paper(Theory)	:	10 Marks
2. Practical Examination of 3 hours duration	:	50 Marks
3. Theory Examination of 3 hours duration	:	90 Marks
Total	:	150 Marks

4th Sem BCA
Paper : BCCsT4.3 Unix Operating System

4 Hrs /Week **Total: 60 Hrs.**

❖ **Chapter 1: INTRODUCTION TO UNIX** **4 Hrs**

Evolution of UNIX - UNIX System Structure - Features of Unix - Operating System Services. Architecture of UNIX system, architecture of kernel, features of Kernel.

❖ **Chapter 2: UNIX FILE SYSTEM** **10 Hrs**

Boot block, super block, I-node block and data blocks, Types of files, types of users, UNIX directory structure, File access methods. File and directory related commands-ls, cat, cal, date, calendar, who, printf, tty, sty, uname, passwd, echo, tput, bc, script, spell and ispell, pwd, the Home directory, absolute pathnames, using absolute pathnames for a command, cd, mkdir, rmdir, Relative pathnames.

❖ **Chapter 3 : SPECIAL TOOL UTILITY** **10 Hrs**

File permission and their modes, path, head, tail, wc, tr, cut, sort, grep, egrep, fgrep, tar.

❖ **Chapter 4: PROCESS MANAGEMENT** **10 Hrs**

The process: shell process, parent and children, process status, system process, multiple jobs in background and foreground, changing process priority with nice, premature termination of process. Communication commands-,write, wall, mesg, kill and finger command.

❖ **Chapter 5: TEXT EDITING WITH VI EDITOR:** **10 Hrs**

Different Modes - Cursor Movement Commands – Edit Commands - Saving and Exiting - Miscellaneous Commands - Alphabetical List of Keys. Communicating with Other Users: who, mail, wall, send, mesg, ftp.

❖ **Chapter 6: Shell Programming** **16 Hrs**

Shell Basics-Types of shells, Shell functionality, Environment. Writing first script-Writing script & executing basic script, Debugging script, Making interactive scripts, variables (default variables), Mathematical expressions. Conditional statements-If-else-elif, Test command, Logical operators-AND, OR, NOT, case –esac. Loops- While, For, Until, Break and continue, Command line arguments-Positional parameters, Set and shift ,IFS. Examples.

Reference Books:

1. UNIX – The Complete Reference– Second Edition.
2. Classic Shell Scripting- Arnold Robbins & Nelson H. F. Beebe
3. Unix Shell Programming (3rd Edition) 3rd Edition by Stephen G. Kochan (Author), Patrick Wood (Author)

4. Classic Shell Scripting: by Arnold Robbins (Author), Nelson H. F. Beebe (Author)

BCACsP4.4: UNIX Lab
Practical

4 Hrs/Week **Total Marks: 50**

1. Use of Basic UNIX Shell Commands: ((man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) commands
2. Write a Shell Program to check whether a given year is leap year or not.
3. Write a shell Script program to check whether the given number is even or odd.
4. Write a shell program to check whether a given string is a palindrome or not.
5. Simple shell script for basic arithmetic operations
6. Write a shell program to count the number of vowels.
7. Write a shell script to print the multiplication table for the given number.
8. Write a shell program to find the factorial of a given number.
9. Write a shell script to count lines, words and characters in its input
10. Write a shell program to print a string in reverse order.
11. Write a shell program to display all the files in the current directory.
12. Write a shell script that computes the gross salary of a employee according to the following rules: i)If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic. ii)If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic The basic salary is entered interactively through the key board.
13. Write a shell script to compute gcd lcm & of two numbers. Use the basic function to find gcd & LCM of N numbers.
14. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
15. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

Scheme for Practical Examination

1. Writing Two programs	:20 Marks
2. Execution of two programs	:20 Marks
3. Practical record	:05 Marks
4. Viva Voce	:05 Marks
Total	:50 Marks

Note

1. Internal Assessment for each paper(Theory)	:10 Marks
2. Practical Examination of 3 hours duration	:50 Marks
3. Theory Examination of 3 hours duration	:90 Marks
Total	:150 Marks

4th Sem BCA

Paper : BCACsT4.5: Analysis And Design of Algorithms Theory

4 Hrs /Week **Total: 60 Hrs**

❖ **Chapter 1 : Introduction** **10 Hrs**

Definition of algorithm, characteristic of algorithm, study of an algorithm, analysis of algorithm, space complexity, time complexity, asymptotic notations : Big-Oh, Omega, Theta. Different control structures, writing structured programming, advantages of structured programming.

❖ **Chapter 2 : Divide and Conquer** **10 Hrs**

General method, binary search, finding maximum & minimum, merge sort, quick sort. [concepts algorithms and tracing]

❖ **Chapter 3 : Greedy Method** **10 Hrs**

General method, knapsack problem, job sequencing with deadline, minimum – cost spanning trees, single–source shortest path.

❖ **Chapter 4 : Dynamic Programming** **10 Hrs**

Introduction to graphs, definition types, terms related to graph, general method, multistage graphs, all pair shortest paths, the traveling salesman problem, flow shop scheduling.

❖ **Chapter 5 : Basic traversal & search techniques** **10 Hrs**

Search & traversal techniques for trees, search & traversal techniques for graphs.

❖ **Chapter 6 : Backtracking** **10 Hrs**

General method, 4-Queens problem, sum of subsets, graph coloring, Hamiltonian cycle.

Reference Books

1. **"**Programming in Ada" by John Barnes, Cambridge University Press
2. Introduction to Algorithms by Thomas H. Cormen , Charles E. Leiserson , Ronald L. Rivest, Clifford Stein, MIT; 3rd edition
3. Design and analysis of algorithms by R. Panneer Selvam second edition, PHI publication.
4. Introduction to the design and analysis of algorithms second edition, By Anany Lebtin Pearson international edition.

BCACsP4.6 : ADA Lab Using C++

Practical

4 Hrs/Week **Total Marks: 50**

1. Write a C++ program to implementation of Binary Search.
2. Write a C++ program to implementation of linear search.
3. Write a C++ program to find GCD & Factorial using recursion technique.
4. Write a C++ program to implementation of Bubble sort.
5. Write a C++ program to implementation of Selection sort.
6. Write a C++ program to implementation of insertion sort.
7. Write a C++ program to implementation of quick sort.
8. Write a C++ program to implementation of shell sort.
9. Write a program to from a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.
10. Write a program to find Minimum Cost Spanning Tree of a given undirected graph using Kruskal's algorithm.
11. Write a program to print all the nodes reachable from a given starting node in a digraph using BFS method.
12. Write a program to check whether a given graph is connected or not using DFS method.
13. Write a program to find Minimum Cost Spanning Tree of a given undirected graph using Prim’s algorithm.
14. Write a program to implement Floyd’s algorithm for the All-Pairs-Shortest-Paths problem.
15. Write a program to implement N Queen's problem using Back Tracking.

Scheme for Practical Examination

1.	Writing Two programs	:10 Marks
2.	Execution of two programs	:30 Marks
3.	Practical records	:05 Marks
4.	Viva Voce	:05 Marks
	Total	:50 Marks

Note		
1.	Internal Assessment for each paper(Theory)	:10 Marks
2.	Practical Examination of 3 hours duration	: 50 Marks
3.	Theory Examination of 3 hours duration	: 90 Marks
	Total	: 150 Marks

GUIDELINES FOR FINAL PROJECT WORK

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.

- Project should be carried out in batch with minimum of three and maximum of five students, and it may be a work using the software packages that they have learned or the implementation of Concepts from the papers studied or implementation of any innovative idea.

- The Project work should be compulsorily done in the college only under the supervision of the concerned department staff after taking **project synopsis approval by the BOE Chairman in the beginning of the semester.**

- **The approved synopsis should be included in project report.**

University Exam will be conducted as follows.

- Viva-voce will be conducted at the end of VI semester for 50 marks.

- Both the Examiners (50%+50%) should conduct the Viva-Voce Examination during practical session. Out of 50 marks, 25 for Project Evaluation and 25 for Viva. For awarding a pass, a candidate should have obtained 40% of the Total 100 marks.

- Report should be in A4 size paper & book binding with the following table of contents

1) Certificate
2) BOE approved copy
3) Acknowledgement
4) Synopsis
5) Contents
6) About the project
7) Analysis
8) Design
9) Coding
10) Testing
11) Reports/output
12) Conclusion
13) Bibliography

TUMKUR UNIVERSITY

Syllabus as per CBCS 2016-2017 under Semester Scheme

Computer Science

(BA DEGREE)

Tumkur University

Vishwavidyanilaya Karyalaya,
B.H Road, Tumkur 572103

COMPUTER SCIENCE [BA Degree]

(Syllabus)

FIRST SEMESTER

BACsT1.1: Computer Hardware & Network

BACsP1.1: Hardware LAB

SECOND SEMESTER

BACsT2.1: Fundamentals of Information Technology

BACsP2.1: Office Lab

THIRD SEMESTER

BACsT3.1: C Programming

BACsP3.1: C Lab

FOURTH SEMESTER

BACsT4.1: Unix Operating System

BACsP4.1: Unix Lab

FIFTH SEMESTER

BACsT5.1:HTML

BACsP5.2: HTML Lab

BACsT5.3: DTP (Desktop publishing)

BACsP5.4: DTP Lab

SIXTH SEMESTER

BACsT6.1: Visual Basic Programming

BACsP6.2: VB LAB

BACsT6.3: DBMS

BACsP6.4: Project

TUMKUR UNIVERSITY
BACHELOR DEGREE COURSES-UNDER THE FACULTY OF ARTS (B.A)
(w.e.f. 2016-2017)
COMPUTER SCIENCE [B A Degree]
ABSTRACT

Sem	Paper Code	Paper Name	Hrs / week	Exam Hrs	MAX.MARKS		
					Int. Marks	Ext. Marks	Total
I	BACsT1.1	Computer Hardware & Network	04	03	10	90	100
	BACsP1.2	Hardware LAB	04	03	-	50	50
II	BACsT2.1	Fundamentals of Information Technology	04	03	10	90	100
	BACsP2.2	Office Lab	04	03	-	50	50
III	BACsT3.1	C Programming	04	03	10	90	100
	BACsP3.2	C Programming Lab	04	03	-	50	50
IV	BACsT4.1	Unix Operating System	04	03	10	90	100
	BACsP4.2	Unix lab	04	03	-	50	50
V	BACsT5.1	HTML	03	03	10	90	100
	BACsP5.2	HTML Lab	03	03	-	50	50
	BACsT5.3	DTP (Desktop publishing)	03	03	10	90	100
	BACsP5.4	DTP LAB	03	03	-	50	50
VI	BACsT6.1	Visual Basic Programming	03	03	10	90	100
	BACsP6.2	VB Lab	03	03	-	50	50
	BACsT6.3	DBMS	03	03	10	90	100
	BACsP6.4	Project lab	03	03	-	50	50

Question Paper Pattern

Duration: 3 Hrs. **Max. Marks: 90**

I. Answer any 10 Questions out of 12: (10 x 01 = 10)

II. Answer any 5 questions out of 07: (05 x 03 = 15)

III. Answer any 6 questions out of 08: (06 x 05 = 30)

IV. Answer any 5 questions out of 07: (05 x 07 = 35)

I SEMESTER
Paper: BACsT1.1: Computer Hardware & Network
Theory

4 Hrs/week **Total Hrs: 60**

Chapter 1: Introduction to computers 12 Hrs

Introduction, History of computer, Block diagram of computer, Generation of computer, Classification of computers (based on working principle, size and capability), Characteristics of computer, Applications of computer. Human Computer Interface: Types of software, Operating system as user interface, utility programs, Number System.

❖ Chapter 2 : Input & Output Devices 12 Hrs

Components of computer system, Input Devices : wired/wireless, Keyboard, Mouse, Joystick, Scanner, Digitizers, Light pen, Touch screen, Barcode scanner, Output Devices, Monitor(CRT,LCD,LED), Printer, Dot Matrix, Inkjet, Laser, Thermal, Plotter, Barcode Printers, Sound devices, Speaker, Headphone, Bluetooth, Dongle.

❖ Chapter 3 : Memory Management Techniques 10 Hrs

Types and characteristics, Classification, Semiconductor, Magnetic, Optical ROM and its types, RAM and its types: SDRAM, EDORAM, DDR Series, Flash RAM. Secondary Memory, Hard Disc Drive, Floppy Disc, CDROM, DVD, Pen Drive, flash memories: Mini/micro , SD Card Formatting and Utility Tools.

❖ Chapter 4 : Computer Organization and Architecture: 6 Hrs

C.P.U., registers, system bus, main memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.

❖ Chapter 5: Computer Networks 10 Hrs

Introduction to computer network, data communication, components of data communication, data transmission mode, LAN (**LAN Topologies:** Ring, bus, star, mesh and tree topologies), MAN, WAN.

❖ Chapter 6 : Transmission Media & Network devices 10 hrs

Introduction, Guided Media: Twisted pair, Coaxial cable, Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite. **Network Devices:** NIC, repeaters, hub, bridge, switch, gateway and router. OSI, TCP/IP, layers and functionalities.

Reference Books:

1. Computer Fundamentals: N. Mithili Devi and E. Padma Sri, SKYWARD Publishers.
2. Introduction to computer concepts: Pearson publication.
3. Fundamentals of Computers - V. Rajaraman.: PHI (EEE)
4. Network Flows: Theory, Algorithms, and Applications by Ravindra K. Ahuja, Thomas L. Magnanti, James B. Orlin. 1993

BACsP1.2: Computer Hardware Lab

Practical

4 Hrs/Week **Total Marks: 50**

1. Draw the block diagram of the computer and tabulatly mention the basic configuration of present PC.
2. Study the peripheral device (Keyboard, Mouse, Monitor, Printer).
3. Study of the CPU cabinet with its front and back view (Brief Explanation of SMPS).
4. Study the overview of Motherboard and Microprocessor.
5. To study the Memory
   - RAM
   - ROM
   - DDR Series
   - Hard disk, CD and DVD
6. Study the different types of ports, Cable and Connectors
   - Serial and Parallel port
   - PS/2 Port
   - VGA Port
   - DVI Port
   - Audio Ports
   - Expansion Slots
7. DOS based practical Internal and External commands.
8. Desktop and control panel settings of windows operating system.
9. Assembling and disassembling the system hardware components of the personal computer
10. Format the System. Installation of software and anti-virus software.

Scheme for Practical Examination

1.	Writing Two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical records	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1.	Internal Assessment for each paper(Theory)	:	10 Marks
2.	Practical Examination of 3 hours duration	:	50 Marks
3.	Theory Examination of 3 hours duration	:	90 Marks
	Total	:	150 Marks

II SEMESTER
Paper: BACsT2.1: Fundamentals of Information Technology

Theory

4 Hrs/week **Total Hrs: 60**

❖ Chapter 1: Windows 10 hrs

Windows concepts, general features of windows, different parts of windows screen, Setting the date and time, Icon explanation, paint, notepad, calculator, control panel, mouse properties, multitasking, my computer, folder creation, use of recycle bin, task bar.

❖ Chapter 2: Word Processing – MS-Word 15 hrs

Introduction to MS Word, parts of MS- word, Parts of Ms-word screen, Backstage view, editing the text, formatting the text, Text effects, Bullets add numbering, Paragraph formatting, Borders & Shadings, Text styles, Table formatting, Picture, clipart and shapes adding, SmartArt representing, Screenshot explanation, Header & Footer, Word art, Drop cap, Equations & Symbols, Page setup, Watermark, Envelopes and labels, Mail merge, Auto correct, Word count, Spell & grammar check, Commenting, Restrict editing, Document views, Zoom options, Navigation Pane, Arranging & Splitting word screen, Printing document, Exiting word.

❖ Chapter 3: Worksheet – MS- Excel 15 hrs

Introduction to MS-excel screen, Parts of MS-excel screen, Worksheet basic, Creating worksheet, Entering text, Dates, alphanumeric and values, conditional formatting, table formatting, Cell styles, Auto sum, Sorting & Filtering, Editing the table, Illustrations, Explaining charts, Page setup, Print area, Sheet options, Arranging text & Images, Applying different Formulas, Insert functions, protecting sheet & workbook, workbook views, exiting excel.

❖ Chapter 4: Presentation Graphics – MS-Power Point 10 hrs

Introduction to MS-Power point screen, Parts of MS-Power point screen, News slide & Layout options, editing text, Images & Illustrations, Photo album, Page setup, Slide Themes, Background styles & Graphics, Slide Transition effects, Sound effects for text and images, New animation effects, Order & Reordering animation, Previewing, Slide show from beginning & Custom slide shows, Rehearse timings,

Media controls, Reviewing, Slide sorter and other Views, Color/Grayscale, Window options, exiting PowerPoint.

❖ **Chapter 5: Internet** **10 hrs**

Definition, Internet, Intranet and Extranet, Search engine, video conference, e-commerce, web browsers, website, webpage.

Reference Books:-

1. Microsoft Office 2010 -: John Walkenbach, Herb Tyson, Michael R Groh, Faithe Wempen.
2. Microsoft Office 2010 for windows : Steve Schwartz.

BACsP2.2: MS-OFFICE LAB

Practical

4 Hrs/Week **Total Marks: 50**

❖ **MS Word:**

1. Design your College Banner.
2. Write your syllabus of **Computer Organization and MS-Office** using formatting & Editing features –Cut, Copy, Paste, Bold, Underline, Indentation, Font size, Paragraph line spacing.
3. Write an appointment letter for Marketing Executive of "ABC Company" using the company's letter head.
4. Using Clip Art & WordArt insert images in your document and design it with text special effects and back ground effects.
5. Write your bio-data using formatting tools – colors, numbers/bullets, alignment, and border.
6. Write a birthday invitation to your friends using mail merge.
7. Create a macro to print your College name ".....".
8. Design your Timetable using Table and its formatting features.

❖ **MS Excel:**

1. Design your class Time Table.
2. Prepare a Mark Sheet of your class subjects.
3. Prepare a Salary Slip of an employee.
4. Prepare a bar chart & pie chart for the analysis of Election Results.
5. Prepare a generic Bill of a Super Market.
6. Work on the following exercise on a Workbook:
    a. Copy an existing Sheet
    b. Rename the old Sheet
    c. Insert a new Sheet into an existing Workbook
    d. Delete the renamed Sheet.
7. Prepare an Attendance sheet of 10 students for any 6 subjects of your syllabus. Calculate their total attendance, total percentage of attendance of each student & average of attendance. [Hint: Using Excel in-built functions.]
8. Create a worksheet on Students list and perform the following database functions:-
    a. Sort data by Name
    b. Filter data by Class
    c. Subtotal of No. of students in a Class.

❖ **MS-Power Point:**

Creating new slides, formatting slide layout, slide show & sorter, inserting new slide, slide no., date, time, chart and other tool operations.

❖ **Internet concepts:**

To create an email-id, To compose and send a mail, To forward a mail and to reply for a mail, To send a mail with an attachment, To download the attached document of a mail received, To send a mail to a large number of recipients using cc and bcc options, To search a thing using a search engine, To verify a university /college details by opening their websites, To upload your resume with any one job portal.

III SEMESTER
Paper: BACsT3.1: C Programming Language

Theory

4 Hrs/week **Total Hrs: 60**

❖ **Chapter 1: Introduction to Programming Concepts hrs 6**

Introduction, System software, Application software. Program Translators – Assembler, Compiler, and Interpreter. Programming languages -Machine Level language, Assembly level language, High level language, Compare and contrast – Advantages and disadvantages.

❖ **Chapter 2: Program Development Life Cycle 10 hrs**

Introduction to structured programming, program development life cycle, problem definition, analysis, Design, Coding, Testing and debugging, Documentation and maintenance . Algorithm- Features, Steps involved in developing an algorithm with simple examples, Advantages & disadvantages of algorithm, Flowchart –Symbols used in a flowchart, Steps involved in developing a flowchart with suitable examples, Advantages & disadvantages of flowchart.

❖ **Chapter 3: programming in C 12 hrs**

Introduction to C programming, features of C language, characteristics of C, applications of C, advantages of C. Structure of C program and execution of C program, C character set, C tokens: identifiers, keywords, variables, constants and operators . Types of constants- integer constants, float constants, single character constants and string constants.

❖ **Chapter 4: Data typesand Operators 10 hrs**

Basic data types – int, char, float and double. Qualifiers – short, long, signed and unsigned. Declaration of variables, Assigning values to variables, Defining symbolic constants, Data type conversion: implicit and explicit. Operators-Arithmetic, Assignment, Relational, Logical, Conditional, Bitwise and Special operators. Expressions - Arithmetic expressions, Evaluations of arithmetic expressions, Relational expressions, Logical expressions, conversions, Operator precedence.

❖ **Chapter 5: Input and Output Operations 10 hrs**

Formatted and Unformatted Input/output functions. Format specifier for integers, floating point numbers, characters and strings. Escape sequences.

❖ **Chapter 6: Control structures** **12 hrs**

Types of controls structures-Conditional Statements-Simple if, if-else, nested if, else-if ladder, switch statements. Looping- while, do-while, for loop, Nested for loop statements, Jump Statements- break, continue, return, go to, exit () function.

References:

1. Problem Solving with C -PHI(EEE). By - M.T.Somashekara.
2. Programming with C (Second edition) Byron S Gottfried , Schaum's Outlines (TMH)
3. Programming with C by K.R. Venugopal, Sudeep R Prasad TMH Outlines Series
4. Let us C by Yashwant Kanetkar, BPB
5. Programming in C – E.Balaguruswamy

BACsP3.2: C Programming Lab

Practical

4 Hrs/Week **Total Marks: 50**

1. Write a C Program to Calculate Area and Circumference of circle.
2. Write a C Program to find if a given Year is a Leap Year.
3. Write a C program to swap two numbers.
4. Write a program to illustrate formatted and unformatted I/O functions
5. Write a C Program to check if a given Integer is Odd or Even.
6. Write a C Program to check if a given Integer is Positive or Negative.
7. Write a C Program to Find the Biggest of 3 Numbers.
8. Write a program to illustrate Logical operators.
9. Write a C program to perform addition, subtraction, multiplication and division using switch case.
10. Write a program to illustrate break and continue statements
11. Write a C Program to Calculate the Sum of Odd & Even Numbers.
12. Write a C Program to Reverse a Given Number.
13. Write a C program to find the sum of N Natural Numbers.
14. Write a C Program to generate the Fibonacci Series.
15. Write a C Program to print half pyramid by using * as shown below.

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

IV SEMESTER

Paper: BACsT4.1: Unix Operating System

Theory

4 Hrs/week **Total Hrs: 60**

❖ Chapter 1: Introduction to Operating System 10 Hrs

Introduction to Operating System, Types of operating system – Single user, Multiuser, Mainframe Systems, Desktop Systems, Multiprocessor Systems, Distributed Systems, Clustered Systems, Real - Time Systems, operating system components, operating system services.

❖ Chapter 2: CPU Scheduling 12 Hrs

Process Concept, process state diagram, process Control block, Process Scheduling - Scheduling queues, and scheduler.
Basic concepts, Preemptive and Non-preemptive Scheduling, Scheduling Criteria, Scheduling algorithms- FCFS, Shortest job first Priority scheduling, Round Robin Scheduling, priority scheduling, multilevel feedback queue scheduling.

❖ Chapter 3: Architecture of UNIX 12 Hrs

Architecture of Unix system, architecture of kernel, features of Kernel. Unix File system-Boot block, super block, I-node block and data blocks, Types of files, types of users, UNIX directory structure, File access methods. File and directory related commands-ls, cat, cal, date, calendar, who, printf, tty, sty, uname, passwd, echo, tput, bc, script, spell and ispell, pwd, the Home directory, absolute pathnames, using absolute pathnames for a command, cd, mkdir, rmdir, Relative pathnames.

❖ Chapter 4: Special Tool Utility 12 Hrs

File permission and their modes, path, head, tail, wc, tr, cut, sort, grep, egrep, fgrep, tar. The process: shell process, parent and children, process status, system process, multiple jobs in background and foreground, changing process priority with nice, premature termination of process. Communication commands-,write, wall, mesg, kill and finger command.

❖ Chapter 5: Shell Programming 14 Hrs

Shell Basics-Types of shells, Shell functionality, Environment. Writing first script-Writing script & executing basic script, Debugging script, Making interactive scripts, variables (default variables), Mathematical expressions. Conditional statements-If-else-elif, Test command, Logical operators-AND, OR, NOT, case –esac. Loops- While, For, Until, Break and continue, Command line arguments-Positional parameters, Set and shift ,IFS. Examples.

Reference Books:

1. UNIX – The Complete Reference– Second Edition.
2. Classic Shell Scripting- Arnold Robbins & Nelson H. F. Beebe
3. Unix Shell Programming (3rd Edition) 3rd Edition by Stephen G. Kochan (Author), Patrick Wood (Author)
4. Classic Shell Scripting: by Arnold Robbins (Author), Nelson H. F. Beebe (Author)

BACsP4.2: Unix Lab Practical

4 Hrs/Week **Total Marks: 50**

1. Use of Basic UNIX Shell Commands: ((man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) commands
2. Write a Shell Program to check whether a given year is leap year or not.
3. Write a shell Script program to check whether the given number is even or odd.
4. Write a shell program to check whether a given string is a palindrome or not.
5. Simple shell script for basic arithmetic operations
6. Write a shell program to count the number of vowels.
7. Write a shell script to print the multiplication table for the given number.
8. Write a shell program to find the factorial of a given number.
9. Write a shell script to count lines, words and characters in its input
10. Write a shell program to print a string in reverse order.
11. Write a shell program to display all the files in the current directory.
12. Write a shell script that computes the gross salary of a employee according to the following rules: i)If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic. ii)If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic The basic salary is entered interactively through the key board.
13. Write a shell script to compute gcd lcm & of two numbers. Use the basic function to find gcd & LCM of N numbers.

14. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
15. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

V SEMESTER
Paper BACsT5.1: HTML

Theory

3 Hrs/Week **Total Hrs: 52**

❖ Chapter 1: HTML 4 Hrs

The World Wide Web (WWW) and history of HTML, Hypertext and Hypertext Markup Language, Why HTML, Prerequisites,

❖ Chapter 2 : HTML Documents 8 Hrs

Dividing the document into 2 parts, Headers tags, Body tags, Delimiters, Tags, Elements, Attributes, Elements of an HTML Document , Text Elements, Tag Elements, Special Character elements, HTML Comments.

❖ Chapter 3 : Structural elements of HTML documents 6 Hrs

Header tags, Body tags, Heading tags, Inserting horizontal lines, Paragraphs, Breaks, Titles, Lists: Numbered List, Non-Numbered list, Definition list, Nested list, Marquee.

❖ Chapter 4 :Formatting HTML Documents 8 Hrs

Logical styles (source code, text enhancements, variables), Physical Styles (Bold, Italic, underlined, crossed)

❖ Chapter 5 : Managing images in html 8 Hrs

Image format (quality, size, type …), Importing images (scanners), Tags used to insert images, Frames, Hyperlinks.

❖ Chapter 6 : Tables in HTML documents 8 Hrs

Tags used in table definition, Tags used for border thickness, Tags used for cell spacing, Tags used for table size, Dividing table with lines, Dividing lines with cells. Cell types: Titles cell, Data cell.

❖ Chapter 7 : Frames and Forms & Inputs 10 Hrs

Create Form , Create text fields, Create password field, Checkboxes, Radio buttons, Simple drop-down list, Drop-down list with a pre-selected value, Text area (a multi-line text input field), Create a button, Draw a border around form-data, Form with text fields and a submit button, Form with checkboxes and a submit button, Form with radio buttons and a submit button, Send e-mail from a form.

Reference Books :

1. Robert W.Sebesta: Programming the World Wide Web, 4th Edition, Pearson Education, 2008 (chapters 1 to 9)
2. Web programming: Srikanth S, Skyward Publishers.
3. HTML & CSS: The Complete Reference, Fifth Edition (Complete Reference Series) by Thomas A. Powell (Author)
4. Html 5 Foundations by Matt West Published by Wiley India Pvt.Ltd

BACsP5.2 – HTML Lab
Practical

3 Hrs/Week **Total Marks: 50**

1. Write HTML code to display your "My First Page" in any color, giving details of your Register Number, Name, Fathers Name , DOB and Address.
2. Write HTML code to design a page containing a text in a paragraph give suitable heading style.
3. Create a page to show different attribute of Font tags - italic, bold, underline and etc.
4. Write a HTML code to display the image of your college and your college name to flash at the bottom of your screen.
5. Write a HTML code to display different types of list.
6. Create a HTML document containing a nested list.
7. Write HTML code to insert a Product, when user clicks on the product, it should provide information about it.
8. Create a web Page using HREF tag having the attribute ALINK, VLINK etc.
9. Create HTML document to display National bird, Animal, Flag and at the back ground National song to be played.
10. Create your college time table by using table tags.
11. Create three Frames in a single window. Link three web sites to display in another frame.
12. Create a Form to fill in your Bio data.

V SEMESTER
Paper: BACsT5.3: Desktop Publishing

Theory

3 Hrs/week **Total Hrs: 52**

❖ Chapter 1: Basic formatting in Pagemaker 7.0 8 hrs

Introduction to Pagemaker 7.0, Parts of pagemaker screen tools, colouring using color palette, Saving pagemaker document, Place to insert image, exporting the pagemaker document, character formatting, Paragraph formatting, Styles, Actual size & Fit in window options, Basic text formatting.

❖ Chapter 2: Advanced formatting in Pagemaker 7.0 10 hrs

Multiple paste options, Basic text formatting, multiple pasting options, Story editing, Inserting and sorting pages, Removing & and Renaming pages, Column guides options, Alignments & Styles, Indents and tabs, Fill element, Stroke option, Frame options, Arranging & aligning images, Text wrapping by using images, Grouping & ungrouping images, Polygon settings, Rounded corners, Plugins, color defines, Arranging text with images in one window, Zoom options, Hiding & viewing all tool bars, Arranging icons, Window arranging, plug-in-pallettes, exiting Pagemaker 7.0.

❖ Chapter 3:Basic graphic formatting in Coreldraw-15 6 Hrs

Introduction, to coreldraw-15, Getting started, creating new Graphic with mode, size, color mode & resolution, Moving around and viewing drawings, special tool bar explaination, Cropping, erasing & deleting the drawings.

❖ Chapter 4: Special tools working in Coreldraw-15 10 Hrs

Freehand, Bezier, artistic media, pen, polyline, 3-point curve tools, Basic shapes, text tools, Table tool, dimension tools, connecting tools, Blend, contour, distort, Dropshadow, envelope, Transparency & extrude tools, Outline options, shape filling options like, uniform, fountain, pattern, texture & Postscript & color, mesh effects, Importing images, printing setup, Duplicating image, Clone option, wireframe till enhanced, Page sorting, Page setup, Duplicating page & renaming, background options to page, Transformations, Grouping & ungrouping, combining objects, lock objects, Shaping, effects, corrections, 3D effects, in Bitmaps, Text fit to path options, Tools & window hiding & unhiding options, Exiting Coreldraw-15.

❖ Chapter 5: Basic working Photoshop CS2 — 6 Hrs

Introduction to photoshop CS2, Getting started, creating new photoshop document with preset, size, & mode, Layers & pallettes, color pallettes, Navgator setup palette, tool bars, Menu bar.

❖ Chapter 6: Special tools working in Photoshop CS2 — 12 Hrs

Marquee tool options, Lasso tools, Magic wand tool, cropping tool, Healing brush tool, Patch tool, clone & pattern stamp tools, Different eraser tools, Blur,sharpen and smudge tools, Gradient & paint bucket tools, Dodge, burn & Sponge tools, Text tool, different pen tools, Different shape tools, hand tool, Zoom tool, Saving photoshop document in different formats, Place to import images, Printing different options, Free transform, Image mode, Adjustments, Duplicating, deleting, filling & Grouping for layers, Applying different effects to the Layers, selecting and deselecting Layers options, Liquifying & filtering window views, window arranging options, exiting photoshop CS2.

References Books:

1. Smart DTP Course (Free Software DVD) (Self Learning book for Type Setting, Layout Designing, Page Making, Photo Editing, Logo Designing & Object Designing etc.) by Soumya Ranjan Behera (Author), Debasis Mishra (Author)
2. Desk Top Publishing By International Association of Business

BACsP5.3 : DTP Lab

Practical

3 Hrs/Week — **Total Marks: 50**

❖ PageMaker:

1. Create a Greeting Card for New Year.
2. Create a Visiting Card.
3. Create your Resume.
4. Create an advertisement for job in well-known form.
5. Create a Newspaper Report.
6. Create a document by importing Graphic Image from Clip Art.
7. Create a Wedding Card.
8. Type a document using Story Editor.
9. Input a text from Word Document into a PageMaker document.
10. Create a document on Importance of Text Wrap, applying proper font size, tabs, alignment & indentation.

❖ Photoshop:

11. Create a digital image, try different resolutions, store as raster image/bitmap/vector image/graphic image. Use different file formats (JPEG, PSD, PDD, TIFF, GIF)
12. Understanding various tools: marquee, Rectangular/Elliptical fill, move, lasso types, Magic wand, crop, airbrush, paint brush, pencil, rubber stamp, pattern stamp, erase, paint-bucket, direct selection, path component selection, pen, custom shape, eye dropper, hand, zoom
13. Working with layers - lock layers, merge down, merge, visible, flatten image, layer sets

❖ CorelDraw:

14. Creating a drawing, set rulers, grid, guidelines, and view document.
15. Grouping/ungrouping, locking/unlocking objects, using layers, aligning and editing objects – pattern/texture fills, editing/applying end shapes, splitting/erasing portions, positioning, moving, stretching, and rotating objects
16. Formatting text and paragraph, creating and adding blends, envelopes, extrusions, 3D special effects, different formats and layouts, previewing, sizing and printing a job.

VI SEMESTER
Paper: BACsT6.1: Visual Basic Programming

Theory

3 Hrs/Week **Total Hrs: 52**

❖ Chapter 1: Beginning Visual Basic 8 Hrs

Introduction to Visual Basic, Features of Visual Basic, The Visual Basic Philosophy, structure of VB environment. The integrated development environment. VB components.

❖ Chapter 2: Dealing With Data 10 Hrs

Operators, Variables, Declaring Variables, Types of Variables, Data types, Constants. Arrays: Declaring Arrays, Specifying Arrays, Multidimensional Arrays, Dynamic Arrays, control array

❖ Chapter 3 : Writing Code 10 Hrs

Collections, Procedures, Subroutines, Functions, Calling Procedures, Object Browser, Creating Classes & Object, Message box and input box, Control Flow Statements: If-Then, If-then-else, Nested if Statements, Select-Case, Loop Statements: Do-Loop, For-Next, While-Wend, Exit Statement.

❖ Chapter 4 : Creating an Application Using Controls 8 Hrs

Toolbar: Textbox Control, Picture Box, Image Box, Label Box, Frame, List Box, Option Button, Combo Box, Command Button, Check Box, The Drive, Directory, File List Controls, The Line & Shape Control, Scroll Box, Data, and Timer.

❖ Chapter 5: Multiple Document Interface & Menus 6 Hrs

MDI Forms, Features of an MDI forms, Loading MDI forms & child forms, Creating a simple MDI forms, Accessing MDI forms, Creating MENUS, POP-UP MENUS.

❖ Chapter 6: DATA Access Controls 10 Hrs

JET database Engine, ADODC, DAO Data Control, ADO,RDO, ODBC Data Source Administrator, DATA REPORT.

References Books :

1. Gottfried, “Programming with Visual Basic 6”, PHI, 2000.
2. Visual Basic 6 – Programming black book – stevan holzner
3. Visual Basic – Dr. A Murugan and Dr. K Shyamala , Margham Publication – 2nd edition.

BACsP6.2: VB Lab

3 Hrs/Week **Total Marks: 50**

1. Write a VB Program to perform addition, subtraction, multiplication and division(Use functions for the calculations).
2. Write a VB program to find the simple interest and compound interest.
3. Design a User Interface (UI) to accept the student details such as name, department and total marks. Validate the input data and calculate the percentage and division.
4. Develop a quiz application in Visual Basic.
5. Develop a calculator by using control array.
6. Develop a VB program to perform a basic string operation(Concatenation, Reverse, Trim, Copy, length, compare etc)
7. Design a VB application which has MDI and Child forms. Create a menu having the items such as file (New, Open),Format (Font, Regular, Bold ,Italic) and Exit in the MDI form. Also create a text box and use a Common Dialog Box control for changing the font, fore color and back color of the text box.
8. Write a VB Program to Validate the username and password form the database and display the appropriate message.(Use Data Control)
9. Write a VB program to create a simple text editor.
10. Design a VB application to record the employee details such as EmpId, EmpName, Designation and Baisc Pay . Calculate the DA, HRA, Deduction and Gross Salary.(Make the necessary assumptions)Use Select .. case for decision making.
11. Design a VB application to accept the student details (roll no., name, address, mobile number). The application should allow operations –Add, Modify, Delete ,Update and Navigations of the items. Use DAO Date controls.
12. Design a VB application to accept the Item Details (Item ID, Item Name, MFD Date, Unit Of Measure and RatePerUnit).Item Id should be a system generated ID. The application should allow operations –Add, Modify, Delete ,Update and Navigations of the items. Use ADO Date controls and Grid controls.

VI SEMESTER SYLLABUS

Paper : BACsT6.3: DBMS

Theory

3 Hrs/week **Total Hrs: 52**

❖ Chapter 1: Introduction to DBMS 10 Hrs

Introduction to DBMS, Types of data processing, Disadvantages of file processing systems, Database processing environment, Basic definitions, Advantages of DBMS, Disadvantages of DBMS, Main characteristics of database, Data models, schemas and instances, DBMS architecture and data independent, Three schema architecture, Data independence, Logical data independence, Physical data independence, Database language and interfaces, Data manipulation language, Database users, Database administrator.

❖ Chapter 2: Data models 8 Hrs

Introduction, Object based models , Record based models, Basic concepts of E-R model, Entities and entity sets, Attributes, Relationships, Keys, Entity relationship diagram, Relational model, Advantages of Relational model, disadvantages, network model, Advantages of network model, disadvantages of network model, hierarchical model, Advantages of hierarchical model, disadvantages of hierarchical model, physical data models

❖ Chapter 3: RDBMS 6 Hrs

Introduction, Concepts of relational model, Tuples, Characteristics of relations, Update operations on relations, Insert operation, Delete operation, The modify operation, Relational algebra , Relational calculus

❖ Chapter 4: Database design 10 Hrs

Introduction, Design guidelines, Semantics of attributes, Reducing redundant values on tuples, Null values in tuples, Disallowing spurious tuples, Functional dependences, Logical implications, Normalizations, First normal form, Second normal form, Third normal form, Boyce-codd normal form.

❖ Chapter 5 : MS-ACCESS 10 Hrs

Access Basics ,Design a Database, Build a Database, Work with Forms, Sort, Retrieve, Analyze Data, Work With Reports, Access with Other Applications, Manage an Access Database.

❖ Chapter 6: SQL 8 Hrs

Introduction, Data definitions language, Data manipulation languages, Transaction control language, Data types used in SQL , Data definition, Data manipulation, Set operations, Union, Intersection , Minus, Join operator, Nested queries, Aggregate and grouping functions

Reference Books :

1. Elmasri and Navathe, Fundamentals of Database Systems (4th Edition), Pearson Education, 2003
2. Sundrraman, Oracle 9i programming A Primer, 1/e Pearson Education.
3. Kahate, Introduction to Database Management System, Pearson Education 2004.
4. Abrahamsi, Silberschat, Henry. F. Korth, S. Sudarshan, Database System Concepts,Mc.graw hill.
5. Jefry. D. Ullman, Principles of database system.

Exercise Programs

1. 1.Create a database using MS-ACCESS with at least 5 records
TABLE1 STRUCTURE: REGISTER NUMBER NAME DOB GENDER CLASS
TABLE2 STRUCTURE: REGISTER NUMBER M1 M2 M3 M4 M5 TOTAL
Maintain the relationship between two tables with REGISTER NUMBER as a Primary Key and answer the following quarries:
Show the list of students with the following fields as one query REGISTER NUMBER NAME GENDER TOTALMARKS
Maintain the relationship between above two tables with REGISTER NUMBER as a Primary Key and answer the following reports: Reports must have following columns

- Report1 with REGISTER NUMBER, NAME, MARKS OF ALL SUBJECTS and TOTAL
- Report2 with REGISTER NUMBER, TOTAL , PERCENTAGE.

2. Create a database using MS-ACCESS with at least 5 records
TABLE1 STRUCTURE: EMP-CODE EMP-NAME AGE GENDER DOB
TABLE2 STRUCTURE: EMP-CODE BASIC-PAY
Maintain the relationship between two tables with EMP-CODE as a Primary Key generates the following reports:
REPORT1: EMP-CODE EMP-NAME BASIC-PAY DA HRA GROSS-SALARY
REPORT2: EMP-CODE EMP-NAME AGE GENDER GROSS-SALARY

3. Create four tables for the VideoParlour database using Design view. The tables are Member to hold members details, Video to hold details of videos,

VideoForRent to hold the details of copies of videos for rent, and RentalAgreement to hold the details of video rentals by members.

The Member table has the following fields (with the data type of each in brackets):
memberNo (AutoNumber), fName (Text), lName (Text), gender (Text), DOB (Date/Time), address (Text), dateJoined (Date/Time), comments (Memo)
The primary key is memberNo.
(Also for this table, set the format property of the gender field to a field size of 1 with an Input Mask >L. Also, set this field with a Validation Rule ="M" or "F" and Validation Text Please enter M or F. If you do not understand the purpose of the properties associated with each field, Use the help facility using the F1 key).
The Video table has the following fields (with the data type of each in brackets):
catalogNo (Text), title (Text), category (Text), dailyRental (Currency), price (Currency), directorNo (Text).
The primary key is catalogNo
The VideoForRent table has the following fields (with the data type of each in brackets): videoNo (Text), available (Yes/No), catalogNo (Text)
The primary key is videoNo
The RentalAgreement table has the following fields (with the data type of each in brackets): rentalNo (AutoNumber), dateOut (Date/Time), dateReturn (Date/Time), memberNo (Number), videoNo(Text)
The primary key is rentalNo
(Also for this table, set the format property for the dateOut and dateReturn fields to Medium Date format e.g. 10-Oct-00.)

1. Open your VideoParlour database. Create a form for your Video table using the Form Wizard facility and name this form VideoForm1. Use the form to view records in your Video table. Practise, changing between viewing your Video table using Form view and Datasheet view.
2. Create relationships between your Member, RentalAgreement, VideoForRent, Video tables using the Relationship window.
3. Apply filters to the members and video records. For example, create the following filters to view:
   - Only male members of the video shop.

- Only male members of the shop who joined the shop this year in order of last name and then first name.
- All members born in the 1960s.
- Only videos in the Children category with a daily rental rate of less than £4.00 and sorted according to video title.
- Only videos currently available for rent with a certification of "PG" or "U".
- Only videos by a certain director.

4. Using the Select Query window, select your Member, RentalAgreement, VideoForRent, Video tables. Practise, joining and deleting the join lines between your tables. Examine the join properties of the join lines relating your tables.

5. Create a report for your Video table containing the catalogNo, title, category and certificate fields. Group your records according to the values in the category field and then sort on the values in the title field.

Create a report for your Video table containing the category, dailyRental and price fields. Group your records according to the values in the category field and then sum the values in the dailyRental and price fields.

Create a report based on a query that contains the following fields memberNo, fName, lName, videoNo, title, dateOut and dateReturn. Group your records according to memberNo and then order by videoNo.

6. Using Access SQL, create simple select queries on the tables of your StayHome database. For example, create and save the following queries on the Video table.

- List the catalogNo, title and category of the Video table, ordered by video title
- List title, certificate, category and dailyRental of the Video table for videos in the "Childrens" category with a rental rate less than £4.00.
- List all videos with a certification of "PG" or "18"in the Video table.

BACsP6.4: Project Lab

3 Hrs/Week **Total Marks: 50**

GUIDELINES FOR FINAL PROJECT WORK

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Project should be carried out in batch with minimum of three and maximum of five students, and it may be a work using the software packages that they have learned or the implementation of Concepts from the papers studied or implementation of any innovative idea.
- Students should collect the requirements and work in the allotted Lab hours in the college only.
- Viva-voce will be conducted at the end of VI semester for 50 marks.
- Report should be in A4 paper & book binding with the following table of contents

1) Certificate
2) Acknowledgement
3) Synopsis
4) Contents
5) About the project
6) Analysis
7) Design
   a) DFD
   b) ER Diagram
8) Coding
9) Testing
10) Reports/output
11) Conclusion
12) Bibliography

Scheme for Practical Examination

1. Writing about project	:	10 Marks
2. Demonstration of Project	:	30 Marks
3. Project Report	:	5 Marks
4. Viva Voce	:	5Marks
Total	:	50 Marks

Note

1. Internal Assessment for each paper(Theory)	:	10 Marks
2. Practical Examination of 3 hours duration	:	50 Marks
3. Theory Examination of 3 hours duration	:	90 Marks
Total	:	150 Marks

TUMKUR UNIVERSITY

Syllabus as per CBCS 2016-2017 under Semester Scheme

Computer Science

(B.Com DEGREE)

Tumkur University

Vishwavidyanilaya Karyalaya, B.H Road, Tumkur 572103

COMPUTER SCIENCE (B.Com)

FIRST SEMESTER

CSC1T1: Computer Hardware & Networking

CSC1P1: Hardware lab

SECOND SEMESTER

CSC2T1: Fundamental of Information Technology

CSC2P1: MS-OFFICE LAB

THIRD SEMESTER

CSC3T1: Programming Language using **C**

CSC3P1: C Programming Lab

FOURTH SEMESTER

CSC4T1: Unix Operating System

CSC4P1: Unix Lab

FIFTH SEMESTER

CSC5T1: HTML
CSC5P1: HTML Lab

CSC6T1: MIS & Tally
CSC6P1: Tally lab

SIXTH SEMESTER

CSC7T1: Visual Basic Programming

CSC7P1: VB lab

CSC8T1: DBMS

CSC8P1: Mini Project

TUMKUR UNIVERSITY
BACHELOR DEGREE COURSES-UNDER THE FACULTY OF COMMERCE
(B.Com)
(w.e.f. 2016-2017)
COMPUTER SCIENCE [B.Com Degree]
ABSTRACT

Sem	Paper Code	Paper Name	Hrs / week	Exam Hrs	MAX.MARKS		
					Int. Marks	Ext. Marks	Total
I	BCCsT1.1	Computer Hardware & Networking	04	03	10	90	100
	BCCsP1.2	Hardware Lab	04	03	-	50	50
II	BCCsT2.1	Fundamental of Information Technology	04	03	10	90	100
	BCCsP2.2	MS-Office Lab	04	03	-	50	50
III	BCCsT3.1	Programming Language using **C**	04	03	10	90	100
	BCCsP3.2	C Programming Lab	04	03	-	50	50
IV	BCCsT4.1	Unix Operating System	04	03	10	90	100
	BCCsP4.2	Unix lab	04	03	-	50	50
V	BCCsT5.1	HTML	03	03	10	90	100
	BCCsT5.2	HTML Lab	03	03	-	50	50
	BCCsP5.3	MIS & Tally	03	03	10	90	100
	BCCsP5.4	Tally Lab	03	03	-	50	50
VI	BCCsT6.1	Visual Basic Programming	03	03	10	90	100
	BCCsT6.2	VB Lab	03	03	-	50	50
	BCCsP6.3	DBMS	03	03	10	90	100
	BCCsP6.4	Project lab	03	03	-	50	50

Question Paper Pattern

Duration: 3 Hrs. **Max. Marks: 90**

I.	Answer any 10 Questions out of 12:	(10 x 01 = 10)
II.	Answer any 5 questions out of 07:	(05 x 03 = 15)
III.	Answer any 6 questions out of 08:	(06 x 05 = 30)
IV.	Answer any 5 questions out of 07:	(05 x 07 = 35)

Scheme for Practical Examination

1.	Writing Two programs	:	10 Marks
2.	Execution of two programs	:	30 Marks
3.	Practical records	:	05 Marks
4.	Viva Voce	:	05 Marks
	Total	:	50 Marks

Note

1.	Internal Assessment for each paper(Theory)	:	10 Marks
2.	Practical Examination of 3 hours duration	:	50 Marks
3.	Theory Examination of 3 hours duration	:	90 Marks
	Total	:	150 Marks

I SEMESTER
Paper: BCCsT1.1: Computer Hardware & Network Theory

4 Hrs/week **Total Hrs: 60**

❖ Chapter 1: Introduction to computers 12 Hrs

Introduction, History of computer, Block diagram of computer, Generation of computer, Classification of computers (based on working principle, size and capability), Characteristics of computer, Applications of computer. Human Computer Interface: Types of software, Operating system as user interface, utility programs, Number System.

❖ Chapter 2 : Input & Output Devices 12 Hrs

Components of computer system, Input Devices : wired/wireless, Keyboard, Mouse, Joystick, Scanner, Digitizers, Light pen, Touch screen, Barcode scanner, Output Devices, Monitor(CRT,LCD,LED), Printer, Dot Matrix, Inkjet, Laser, Thermal, Plotter, Barcode Printers, Sound devices, Speaker, Headphone, Bluetooth, Dongle.

❖ Chapter 3 : Memory Management Techniques 10 Hrs

Types and characteristics, Classification, Semiconductor, Magnetic, Optical ROM and its types, RAM and its types: SDRAM, EDORAM, DDR Series, Flash RAM. Secondary Memory, Hard Disc Drive, Floppy Disc, CDROM, DVD, Pen Drive, flash memories: Mini/micro , SD Card Formatting and Utility Tools.

❖ Chapter 4 : Computer Organization and Architecture: 6 Hrs

C.P.U., registers, system bus, main memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.

❖ Chapter 5: Computer Networks 10 Hrs

Introduction to computer network, data communication, components of data communication, data transmission mode, LAN (**LAN Topologies**: Ring, bus, star, mesh and tree topologies), MAN, WAN.

❖ Chapter 6 : Transmission Media & Network devices 10 Hrs

Introduction, Guided Media: Twisted pair, Coaxial cable, Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite. **Network Devices:** NIC, repeaters, hub, bridge, switch, gateway and router. OSI, TCP/IP, layers and functionalities.

Reference Books:

1. Computer Fundamentals: N. Mithili Devi and E. Padma Sri, SKYWARD Publishers.
2. Introduction to computer concepts: Pearson publication.
3. Computer Fundamentals: Anita Goel, Pearson publication.
4. Fundamentals of Computers - V. Rajaraman.: PHI (EEE)
5. Network Flows: Theory, Algorithms, and Applications by Ravindra K. Ahuja, Thomas L. Magnanti, James B. Orlin. 1993.
6. Computer Networks 2013by Andrew S. Tanenbaum

BCCsP1.2 : Computer Hardware Lab
Practical

4 Hrs/Week **Total Marks: 50**

1. Draw the block diagram of the computer and tabulatly mention the basic configuration of present PC.
2. Study the peripheral device (Keyboard, Mouse, Monitor, Printer).
3. Study of the CPU cabinet with its front and back view (Brief Explanation of SMPS).
4. Study the overview of Motherboard and Microprocessor.
5. To study the Memory
   - RAM
   - ROM
   - DDR Series
   - Hard disk, CD and DVD
6. Study the different types of ports, Cable and Connectors
   - Serial and Parallel port
   - PS/2 Port
   - VGA Port
   - DVI Port
   - Audio Ports
   - Expansion Slots
7. DOS based practical Internal and External commands.
8. Desktop and control panel settings of windows operating system.
9. Assembling and disassembling the system hardware components of the personal computer
10. Format the System. Installation of software and anti-virus software.

II SEMESTER

Paper: BCCsT2.1: Fundamentals of Information Technology

Theory

4 Hrs/week **Total Hrs: 60**

❖ Chapter 1: Windows 10 Hrs

Windows concepts, general features of windows, different parts of windows screen, Setting the date and time, Icon explanation, paint, notepad, calculator, control panel, mouse properties, multitasking, my computer, folder creation, use of recycle bin, task bar.

❖ Chapter 2: Word Processing – MS-Word 16 Hrs

Introduction to MS Word, parts of MS- word, Parts of Ms-word screen, Backstage view, editing the text, formatting the text, Text effects, Bullets add numbering, Paragraph formatting, Borders & Shadings, Text styles, Table formatting, Picture, clipart and shapes adding, SmartArt representing, Screenshot explanation, Header & Footer, Word art, Drop cap, Equations & Symbols, Page setup, Watermark, Envelopes and labels, Mail merge, Auto correct, Word count, Spell & grammar check, Commenting, Restrict editing, Document views, Zoom options, Navigation Pane, Arranging & Splitting word screen, Printing document, Exiting word.

❖ Chapter 3: Worksheet – MS- Excel 16 Hrs

Introduction to MS-excel screen, Parts of MS-excel screen, Worksheet basic, Creating worksheet, Entering text, Dates, alphanumeric and values, conditional formatting, table formatting, Cell styles, Auto sum, Sorting & Filtering, Editing the table, Illustrations, Explaining charts, Page setup, Print area, Sheet options, Arranging text & Images, Applying different Formulas, Insert functions, protecting sheet & workbook, workbook views, exiting excel.

❖ Chapter 4: Presentation Graphics – MS-Power Point 10 Hrs

Introduction to MS-Power point screen, Parts of MS-Power point screen, News slide & Layout options, editing text, Images & Illustrations, Photo album, Page setup, Slide Themes, Background styles & Graphics, Slide Transition effects, Sound effects for text and images, New animation effects, Order & Reordering animation, Previewing, Slide show from beginning & Custom slide shows, Rehearse timings, Media controls,

Reviewing, Slide sorter and other Views, Color/Grayscale, Window options, exiting PowerPoint.

❖ **Chapter 5: Internet** **8 Hrs**

Definition, Internet, Intranet and Extranet, Search engine, video conference, e-commerce, web browsers, website, webpage.

Reference Books:

1. Microsoft Office 2010: John Walkenbach, Herb Tyson, Michael R Groh, Faithe Wempen.
2. Microsoft Office 2010 for windows: Steve Schwartz.
3. Microsoft office 2010 The complete reference- by Virginia Andersen.
4. Microsoft Office 2010 Certification Prep By Laura Story, Dawna Walls

BCCsP2.2:MS-OFFICE LAB
Practical

4 Hrs/Week **Total Marks: 50**

1) Create a Letter format by using MS-word.
2) Create a company letter head by using MS-word.
3) Create your own resume by using MS-word
4) Create a greeting card.
5) Create a Cover Page of project by using MS-word.
6) Create a Mail merge letter.
7) Create a Spreadsheet in MS-EXCEL and enter the marks of a student, calculate total and Print grade if the student has passed in all subjects.
8) Enter the following details for 10 employees employee code, name, basic salary, DA , HRA, Loans , total salary and tax.
9) Create a Spreadsheet in MS-EXCEL Implement five functions each for Arithmetic, date and time, financial, logical and statistical functions. Write the syntax, example and output for simple programs.

10) A bank offers loan for housing and vehicle at an interest of 10.25% for housing and 14.2% for vehicle. For a loan applicants compute the monthly premium (EMI), given total installments as 24 months. Also compute the monthly interest and monthly principal amount and total amount of principal and interest using financial library functions in a spreadsheet.
11) Create a simple bar chart to high light the sales of a company for 3 different periods:
12) Create a pie chart for a sample data and give legends:
13) Create a worksheet importing data from database and calculate sum of all the columns:
14) Create text and images with effects
15) Create a Power-point presentation with animation & sound effects consist of at least 10 slides.

Internet concepts:

16) To create an email-id, To compose and send a mail, To forward a mail and to reply for a mail, To send a mail with an attachment, To download the attached document of a mail received, To send a mail to a large number of recipients using cc and bcc options, To search a thing using a search engine, To verify a university /college details by opening their websites, To upload your resume with any one job portal.

III SEMESTER
Paper: BCCsT3.1: Programming Language Using C
Theory

4 Hrs/week **Total Hrs: 60**

❖ **Chapter 1: Introduction to Programming Concepts** **6 Hrs**

Introduction, System software, Application software. Program Translators – Assembler, Compiler, and Interpreter. Programming languages - Machine Level language, Assembly level language, High level language, Compare and contrast – Advantages and disadvantages.

❖ **Chapter 2: Program Development Life Cycle** **10 Hrs**

Introduction to structured programming, program development life cycle, problem definition, analysis, Design, Coding, Testing and debugging, Documentation and maintenance . *Algorithm*- Features, Steps involved in developing an algorithm with simple examples, Advantages & disadvantages of algorithm, *Flowchart* –Symbols used in a flowchart, Steps involved in developing a flowchart with suitable examples, Advantages & disadvantages of flowchart.

❖ **Chapter 3: programming in C** **12 Hrs**

Introduction to C programming, features of C language, characteristics of C, applications of C, advantages of C. Structure of C program and execution of C program, C character set, C tokens: identifiers, keywords, variables, constants and operators . Types of constants- integer constants, float constants, single character constants and string constants.

❖ **Chapter 4: Data types and Operators** **10 Hrs**

Basic data types – int, char, float and double. Qualifiers – short, long, signed and unsigned. Declaration of variables, Assigning values to variables, Defining symbolic constants, Data type conversion: implicit and explicit. Operators-Arithmetic, Assignment, Relational, Logical, Conditional, Bitwise and Special operators. Expressions - Arithmetic expressions, Evaluations of arithmetic expressions, Relational expressions, Logical expressions, conversions, Operator precedence.

❖ **Chapter 5: Input and Output Operations** **10 Hrs**

Formatted and Unformatted Input/output functions. Format specifier for integers, floating point numbers, characters and strings. Escape sequences.

❖ **Chapter 6: Control structures** **8 Hrs**

Types of controls structures-Conditional Statements-Simple if, if-else, nested if, else-if ladder, switch statements. Looping- while, do-while, for loop, Nested for loop statements, Jump Statements- break, continue, return, go to, exit () function.

❖ **Chapter 7. Arrays & Strings** **4 Hrs**

Introduction, single dimensional array, two-dimensional arrays, initializing 2-d arrays, multidimensional arrays. Declaring and initializing string variables, functions String

Reference Books:

1. Problem Solving with C -PHI(EEE). By - M.T.Somashekara.
2. Programming with C (Second edition) Byron S Gottfried , Schaum's Outlines (TMH)
3. Programming with C by K.R. Venugopal, Sudeep R Prasad TMH Outlines Series
4. Programming in ANSI C by Ram Kumar, Rakesh agrawal, TMH
5. Let us C by Yashwant Kanetkar, BPB
6. Programming in C – E.Balaguruswamy

BCCsP3.2: C Programming Lab Practical

4 Hrs/Week **Total Marks: 50**

1. Write a C Program to Calculate Area and Circumference of circle.
2. Write a C Program to Find if a given Year is a Leap Year.
3. Write a C program to swap two numbers.
4. Write a C Program to Check if a given Integer is Odd or Even .
5. Write a C Program to Check if a given Integer is Positive or Negative.
6. Write a C Program to Find the Biggest of 3 Numbers.
7. Write a C program to perform addition, subtraction, multiplication and division using switch case.
8. Write a C Program to Calculate the Sum of Odd & Even Numbers.
9. Write a C Program to Reverse a Number & Check if it is a Palindrome.
10. Write a C Program to Reverse a Given Number.
11. Write a C program to addition of N Natural Numbers.

12. Write a C Program to print half pyramid as using * as shown in figure below.

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

13. Write a C program to print pyramid using *.

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

14. Write a C Program to generate the Fibonacci Series starting from any two numbers.
15. Write a C Program to read & display array elements.

IV SEMESTER

Paper: BCCsT4.1: UNIX Operating System

Theory

4 Hrs/week **Total Hrs: 60**

❖ **Chapter 1: Introduction to Operating System** **Hrs10**

Introduction to Operating System, Types of operating system – Single user, Multiuser, Mainframe Systems, Desktop Systems, Multiprocessor Systems, Distributed Systems, Clustered Systems, Real - Time Systems, operating system components, operating system services.

❖ **Chapter 2: CPU Scheduling** **12 Hrs**

Process Concept, process state diagram, process Control block, Process Scheduling - Scheduling queues, and scheduler.

Basic concepts, Preemptive and Non-preemptive Scheduling, Scheduling Criteria, Scheduling algorithms- FCFS, Shortest job first Priority scheduling, Round Robin Scheduling, priority scheduling, multilevel feedback queue scheduling..

❖ **Chapter 3: Architecture of UNIX** **12 Hrs**

Architecture of Unix system, architecture of kernel, features of Kernel. Unix File system-Boot block, super block, I-node block and data blocks, Types of files, types of users, UNIX directory structure, File access methods. File and directory related commands-ls, cat, cal, date, calendar, who, printf, tty, sty, uname, passwd, echo, tput, bc, script, spell and ispell, pwd, the Home directory, absolute pathnames, using absolute pathnames for a command, cd, mkdir, rmdir, Relative pathnames.

❖ **Chapter 4: Special Tool Utility** **12 Hrs**

File permission and their modes, path, head, tail, wc, tr, cut, sort, grep, egrep, fgrep, tar. The process: shell process, parent and children, process status, system process, multiple jobs in background and foreground, changing process priority with nice, premature termination of process. Communication commands-,write, wall, mesg, kill and finger command.

❖ **Chapter 5: Shell Programming** **14 Hrs**

Shell Basics-Types of shells, Shell functionality, Environment. Writing first script-Writing script & executing basic script, Debugging script,

Making interactive scripts, variables (default variables), Mathematical expressions. Conditional statements-If-else-elif, Test command, Logical operators-AND, OR, NOT, case –esac. Loops- While, For, Until, Break and continue, Command line arguments-Positional parameters, Set and shift ,IFS. Examples.

Reference Books:

1. UNIX – The Complete Reference– Second Edition.
2. Classic Shell Scripting- Arnold Robbins & Nelson H. F. Beebe
3. Unix Shell Programming (3rd Edition) 3rd Edition by Stephen G. Kochan (Author), Patrick Wood (Author)
4. Classic Shell Scripting: by Arnold Robbins (Author), Nelson H. F. Beebe (Author)

BCCsP4.2: UNIX Lab
Practical

4 Hrs/Week **Total Marks: 50**

1. Use of Basic UNIX Shell Commands: ((man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) commands
2. Write a Shell Program to check whether a given year is leap year or not.
3. Write a shell Script program to check whether the given number is even or odd.
4. Write a shell program to check whether a given string is a palindrome or not.
5. Simple shell script for basic arithmetic operations
6. Write a shell program to count the number of vowels.
7. Write a shell script to print the multiplication table for the given number.
8. Write a shell program to find the factorial of a given number.
9. Write a shell script to count lines, words and characters in its input
10. Write a shell program to print a string in reverse order.
11. Write a shell program to display all the files in the current directory.
12. Write a shell script that computes the gross salary of a employee according to the following rules: i)If basic salary is < 1500 then HRA

=10% of the basic and DA =90% of the basic. ii)If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic The basic salary is entered interactively through the key board.

13. Write a shell script to compute gcd lcm & of two numbers. Use the basic function to find gcd & LCM of N numbers.
14. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
15. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

V SEMESTER

Paper: BCCsT5.1: HTML

Theory

3 Hrs/Week **Total Hrs: 52**

❖ **Chapter 1: HTML** **4 Hrs**

The World Wide Web (WWW) and history of HTML, Hypertext and Hypertext Markup Language, Why HTML, Prerequisites,

❖ **Chapter 2 : HTML Documents** **6 Hrs**

Dividing the document into 2 parts, Headers tags, Body tags, Delimiters, Tags, Elements, Attributes, Elements of an HTML Document , Text Elements, Tag Elements, Special Character elements, HTML Comments.

❖ **Chapter 3 : Structural elements of HTML documents** **6 Hrs**

Header tags, Body tags, Heading tags, Inserting horizontal lines, Paragraphs, Breaks, Titles, Lists: Numbered List, Non-Numbered list, Definition list, Nested list, Marquee.

❖ **Chapter 4 :Formatting HTML Documents** **8 Hrs**

Logical styles (source code, text enhancements, variables), Physical Styles (Bold, Italic, underlined, crossed)

❖ **Chapter 5 : Managing images in html** **8 Hrs**

Image format (quality, size, type …), Importing images (scanners), Tags used to insert images, Frames, Hyperlinks.

❖ **Chapter 6 : Tables in HTML documents** **8 hrs**

Tags used in table definition, Tags used for border thickness, Tags used for cell spacing, Tags used for table size, Dividing table with lines, Dividing lines with cells. Cell types: Titles cell, Data cell.

❖ **Chapter 7 : Frames and Forms & Inputs** **10 Hrs**

Create Form , Create text fields, Create password field, Checkboxes, Radio buttons, Simple drop-down list, Drop-down list with a pre-selected value, Text area (a multi-line text input field), Create a button, Draw a border around form-data, Form with text fields and a submit button,

Form with checkboxes and a submit button, Form with radio buttons and a submit button, Send e-mail from a form.

Reference Books:

1. Robert W.Sebesta: Programming the World Wide Web, 4th Edition, Pearson Education, 2008 (chapters 1 to 9)
2. Web programming: Srikanth S, Skyward Publishers.
3. HTML & CSS: The Complete Reference, Fifth Edition (Complete Reference Series) by Thomas A. Powell (Author)
4. Html 5 Foundations by Matt West Published by Wiley India Pvt.Ltd

BCCsP5.2– HTML Lab

Practical

3 Hrs/Week **Total Marks: 50**

1. Write HTML code to develop a web page having the background in red and title “My First Page” in any other color, giving details of your name, age, address.
2. Write HTML code to design a page containing a text in a paragraph give suitable heading style.
3. Create a page to show different attribute of Font tags - italic, bold, underline.
4. Write a HTML code to create a web page of blue color and display links in red color.
5. Create a college time table by using table tags.
6. Write HTML code to create a WebPages that contains an insert an Image at its left hand side of the page when user clicks on the image; it should open another web page.
7. Create a web Page using HREF tag having the attribute ALINK, VLINK etc.
8. Create a web page, when user clicks on the link it should go to the bottom of the page.

9. Write a HTML code to create a web page of pink color and display moving message in red color.
10. Create a web page, showing an ordered list of name of your five friends.
11. Create a HTML document containing a nested list showing the content page of any book.
12. Create a web page, showing an unordered list of name of your five friends.

V SEMESTER

Paper : BCCsT5.3: MIS, e-commerce & Tally

Theory

3 Hrs/Week **Total Hrs: 52**

❖ Chapter 1 : Introduction to MIS 8 Hrs

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Un-structured decisions, Formal vs. Informal systems. Developing Information Systems: Analysis & Design of Information Systems.

❖ Chapter 2 Introduction to e-commerce 8 Hrs

The scope of electronic commerce, Definition of electronic commerce, Electronic Commerce and the trade cycle, Electronic markets, Research and Support, Electronic Date, Interchange Internet commerce, Categories of e-commerce - B2B, B2C and Intra-Business., Portals, e-Governance, e-Learning and, Knowledge building

❖ Chapter 3 : Tally 10 Hrs

Introduction to Tally, Company Creation – Alter – Display, Accounts info Ledger Creation, Voucher Creation , Bank Reconciliation Statement, Bill wise Details , Cost Centre and Cost Category , Multi-Currency , Interest calculation , Budgets and Credit, Limits – Day Book.

❖ Chapter 4 : Inventory info 16 Hrs

Inventory info, Stock Group , Stock Category , Stock Item ,Unit of Measures, Godowns , Inventory vouchers, Re-order level and status, Batch-wise Details, Bill of Material.

❖ Chapter 5 : Statutory and Taxation 10 Hrs

Value Added Tax (VAT), Tax Deducted at Source (TDS) ,Tax Collected at Source (TCS) Service Tax – Security Control and Tally audit , Export and Import, Backup and Restore , Open Database Connectivity.

Reference Books:

1. MIS by Hossein Bidgoli Nilanjan Chattopadhyay, Published by Cengage Learning.
2. James A. O'Brien, "Management Information Systems", Tata McGraw-Hill
3. Robert G. Murdick & Joel E. Ross & James R. Claggett, "Information Systems for Modern Management", PHI.
4. E-Commerce & Applications by Pandey
5. Learning Tally (with Introduction to Tally.ERP 9) by Ramesh Bangia

BCCsP5.4 – Tally Lab
Practical

3 Hrs/Week **Total Marks: 50**

1. Company Creation.
2. Ledgers and vouchers
3. Purchase and purchase order
4. Sales and sales order
5. Purchase return or debit note.
6. Sales return or credit note.
7. Memorandum vouchers.
8. Pay roll systems
9. Balance sheet
10. Create a report for the following:
    Profit and loss a/c, stock summary, ratio analysis, trail balance, cash flow, fund flow, statistics reports, godown summary, VAT computation, cash summary, bank summary

IV SEMESTER

Paper : BCCsT6.1:Visual Basic Programming

Theory

3 Hrs/Week **Total Hrs: 52**

❖ Chapter 1: Beginning Visual Basic — 8 Hrs

Introduction to Visual Basic, Features of Visual Basic, The Visual Basic Philosophy, structure of VB environment. The integrated development environment. VB components.

❖ Chapter 2: Dealing With Data — 8 Hrs

Operators, Variables, Declaring Variables, Types of Variables, Data types, Constants. Arrays: Declaring Arrays, Specifying Arrays, Multidimensional Arrays, Dynamic Arrays, control array

❖ Chapter 3 : Writing Code — 10 Hrs

Collections, Procedures, Subroutines, Functions, Calling Procedures, Object Browser, Creating Classes & Object, Message box and input box, Control Flow Statements: If-Then, If-then-else, Nested if Statements, Select-Case, Loop Statements: Do-Loop, For-Next, While-Wend, Exit Statement.

❖ Chapter 4 : Creating an Application Using Controls — 10 Hrs

Toolbar: Textbox Control, Picture Box, Image Box, Label Box, Frame, List Box, Option Button, Combo Box, Command Button, Check Box, The Drive, Directory, File List Controls, The Line & Shape Control, Scroll Box, Data, and Timer.

❖ Chapter 5: Multiple Document Interface & Menus — 6 Hrs

MDI Forms, Features of an MDI forms, Loading MDI forms & child forms, Creating a simple MDI forms, Accessing MDI forms, Creating MENUS, POP-UP MENUS.

❖ Chapter 6: DATA Access Controls — 10 Hrs

JET database Engine, ADODC, DAO Data Control,ADO,RDO, ODBC Data Source Administrator, DATA REPORT.

Reference Books:

1. Visual Basic 6 by Gurumit Singh(Aman), Firewall Media.
2. Deitel, Visual Basics 6 – how to program. Peason Education.
3. Visual Basic 6 from the ground up by Garry Cornell, THM.
4. Visual programming by Yashwant Kanitkar.
5. Visual programming by Padmageetha B.G. and Srikanth S

BCCsP6.2: VB Lab

Practical

3 Hrs/Week **Total Marks: 50**

1. Write a VB Program to perform addition, subtraction, multiplication and division(Use functions for the calculations).
2. Write a VB program to find the simple interest and compound interest.
3. Design a User Interface (UI) to accept the student details such as name, department and total marks. Validate the input data and calculate the percentage and division.
4. Develop a quiz application in Visual Basic.
5. Develop a calculator by using control array.
6. Develop a VB program to perform a basic string operation(Concatenation, Reverse, Trim, Copy, length, compare etc)
7. Design a VB application which has MDI and Child forms. Create a menu having the items such as file (New, Open),Format (Font, Regular, Bold ,Italic) and Exit in the MDI form. Also create a text box and use a Common Dialog Box control for changing the font, fore color and back color of the text box.
8. Write a VB Program to Validate the username and password form the database and display the appropriate message.(Use Data Control)
9. Write a VB program to create a simple text editor.
10. Design a VB application to record the employee details such as EmpId, EmpName, Designation and BaiscPay . Calculate the DA, HRA, Deduction and Gross Salary.(Make the necessary assumptions)Use Select .. case for decision making.

11. Design a VB application to accept the student details (roll no., name, address, mobile number). The application should allow operations –Add, Modify, Delete ,Update and Navigations of the items. Use DAO Date controls.
12. Design a VB application to accept the Item Details (Item ID, Item Name, MFD Date, Unit Of Measure and RatePerUnit).Item Id should be a system generated ID. The application should allow operations –Add, Modify, Delete ,Update and Navigations of the items. Use ADO Date controls and Grid controls.

VI SEMESTER
Paper : BCCsT6.3: DBMS
Theory

3 Hrs/week **Total Hrs: 52**

❖ Chapter 1: Introduction to DBMS — 10 Hrs

Introduction to DBMS, Types of data processing, Disadvantages of file processing systems, Database processing environment , Basic definitions, Advantages of DBMS, Disadvantages of DBMS, Main characteristics of database, Data models, schemas and instances, DBMS architecture and data independent, Three schema architecture, Data independence, Logical data independence, Physical data independence, Database language and interfaces, Data manipulation language, Database users, Database administrator.

❖ Chapter 2: Data models — 8 Hrs

Introduction, Object based models , Record based models, Basic concepts of E-R model, Entities and entity sets, Attributes, Relationships, Keys, Entity relationship diagram, Relational model, Advantages of Relational model, disadvantages, network model, Advantages of network model, disadvantages of network model, hierarchical model, Advantages of hierarchical model, disadvantages of hierarchical model, physical data models

❖ Chapter 3: RDBMS — 6 Hrs

Introduction, Concepts of relational model, Tuples, Characteristics of relations, Update operations on relations, Insert operation, Delete operation, The modify operation, Relational algebra , Relational calculus

❖ Chapter 4: Database design — 10 Hrs

Introduction, Design guidelines, Semantics of attributes, Reducing redundant values on tuples, Null values in tuples, Disallowing spurious tuples, Functional dependences, Logical implications, Normalizations, First normal form, Second normal form, Third normal form, Boyce-codd normal form.

❖ Chapter 5 : MS-ACCESS — 10 Hrs

Access Basics ,Design a Database, Build a Database, Work with Forms, Sort, Retrieve, Analyze Data, Work With Reports, Access with Other Applications, Manage an Access Database.

❖ **Chapter 6: SQL** **8 Hrs**

Introduction, Data definitions language, Data manipulation languages, Transaction control language, Data types used in SQL , Data definition, Data manipulation, Set operations, Union, Intersection , Minus, Join operator, Nested queries, Aggregate and grouping functions

Reference Books :

1. Elmasri and Navathe, Fundamentals of Database Systems (4th Edition), Pearson Education, 2003
2. Sundrraman, Oracle 9i programming A Primer, 1/e Pearson Education.
3. Kahate, Introduction to Database Management System, Pearson Education 2004.
4. Abrahamsi, Silberschat, Henry. F. Korth, S. Sudarshan, Database System Concepts,Mc.graw hill.
5. Jefry. D. Ullman, Principles of database system.

Exercise Programs

1. Create a database using MS-ACCESS with at least 5 records
   TABLE1 STRUCTURE: REGISTER NUMBER NAME DOB GENDER CLASS
   TABLE2 STRUCTURE: REGISTER NUMBER M1 M2 M3 M4 M5 TOTAL
   Maintain the relationship between two tables with REGISTER NUMBER as a Primary Key and answer the following quarries:
   Show the list of students with the following fields as one query REGISTER NUMBER NAME GENDER TOTALMARKS
   Maintain the relationship between above two tables with REGISTER NUMBER as a Primary Key and answer the following reports: Reports must have following columns
   - Report1 with REGISTER NUMBER, NAME, MARKS OF ALL SUBJECTS and TOTAL
   - Report2 with REGISTER NUMBER, TOTAL , PERCENTAGE.

2. Create a database using MS-ACCESS with at least 5 records
   TABLE1 STRUCTURE: EMP-CODE EMP-NAME AGE GENDER DOB

TABLE2 STRUCTURE: EMP-CODE BASIC-PAY

Maintain the relationship between two tables with EMP-CODE as a Primary Key generates the following reports:

REPORT1: EMP-CODE EMP-NAME BASIC-PAY DA HRA GROSS-SALARY

REPORT2: EMP-CODE EMP-NAME AGE GENDER GROSS-SALARY

3. Create four tables for the VideoParlour database using Design view. The tables are Member to hold members details, Video to hold details of videos, VideoForRent to hold the details of copies of videos for rent, and RentalAgreement to hold the details of video rentals by members.

   The Member table has the following fields (with the data type of each in brackets):

   memberNo (AutoNumber), fName (Text), lName (Text), gender (Text), DOB (Date/Time), address (Text), dateJoined (Date/Time), comments (Memo)

   The primary key is memberNo.

   (Also for this table, set the format property of the gender field to a field size of 1 with an Input Mask >L. Also, set this field with a Validation Rule =”M” or “F” and Validation Text Please enter M or F. If you do not understand the purpose of the properties associated with each field, Use the help facility using the F1 key).

   The Video table has the following fields (with the data type of each in brackets):

   catalogNo (Text), title (Text), category (Text), dailyRental (Currency), price (Currency), directorNo (Text).

   The primary key is catalogNo

   The VideoForRent table has the following fields (with the data type of each in brackets): videoNo (Text), available (Yes/No), catalogNo (Text)

   The primary key is videoNo

   The RentalAgreement table has the following fields (with the data type of each in brackets): rentalNo (AutoNumber), dateOut (Date/Time), dateReturn (Date/Time), memberNo (Number), videoNo(Text)

   The primary key is rentalNo

(Also for this table, set the format property for the dateOut and dateReturn fields to Medium Date format e.g. 10-Oct-00.)

1. Open your VideoParlour database. Create a form for your Video table using the Form Wizard facility and name this form VideoForm1. Use the form to view records in your Video table. Practise, changing between viewing your Video table using Form view and Datasheet view.

2. Create relationships between your Member, RentalAgreement, VideoForRent, Video tables using the Relationship window.

3. Apply filters to the members and video records. For example, create the following filters to view:
   - Only male members of the video shop.
   - Only male members of the shop who joined the shop this year in order of last name and then first name.
   - All members born in the 1960s.
   - Only videos in the Children category with a daily rental rate of less than £4.00 and sorted according to video title.
   - Only videos currently available for rent with a certification of "PG" or "U".
   - Only videos by a certain director.

4. Using the Select Query window, select your Member, RentalAgreement, VideoForRent, Video tables. Practise, joining and deleting the join lines between your tables. Examine the join properties of the join lines relating your tables.

5. Create a report for your Video table containing the catalogNo, title, category and certificate fields. Group your records according to the values in the category field and then sort on the values in the title field. Create a report for your Video table containing the category, dailyRental and price fields. Group your records according to the values in the

category field and then sum the values in the dailyRental and price fields.

Create a report based on a query that contains the following fields memberNo, fName, lName, videoNo, title, dateOut and dateReturn. Group your records according to memberNo and then order by videoNo.

6. Using Access SQL, create simple select queries on the tables of your StayHome database. For example, create and save the following queries on the Video table.

   - List the catalogNo, title and category of the Video table, ordered by video title
   - List title, certificate, category and dailyRental of the Video table for videos in the "Childrens" category with a rental rate less than £4.00.
   - List all videos with a certification of "PG" or "18"in the Video table.

BCCSP6.4: Project Lab

3 Hrs/Week **Total Marks: 50**

GUIDELINES FOR FINAL PROJECT WORK

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Project should be carried out in batch with minimum of three and maximum of five students, and it may be a work using the software packages that they have learned or the implementation of Concepts from the papers studied or implementation of any innovative idea.
- Students should collect the requirements and work in the allotted Lab hours in the college only.
- Viva-voce will be conducted at the end of VI semester for 50 marks.
- Report should be in A4 paper & book binding with the following table of contents

1) Certificate
2) Acknowledgement
3) Synopsis

4) Contents
5) About the project
6) Analysis
7) Design
   a) DFD
   b) ER Diagram
8) Coding
9) Testing
10) Reports/output
11) Conclusion
12) Bibliography

Scheme for Practical Examination

1. Writing about project	:	10 Marks
2. Demonstration of Project	:	30 Marks
3. Project Report	:	5 Marks
4. Viva Voce	:	5Marks
Total	:	50 Marks

Note

1. Internal Assessment for each paper(Theory)	:	10 Marks
2. Practical Examination of 3 hours duration	:	50 Marks
3. Theory Examination of 3 hours duration	:	90 Marks
Total	:	150 Marks

TUMKUR UNIVERSITY

Syllabus as per CBCS 2016-2017 under Semester Scheme

COMPUTER SCIENCE

COMPUTER FUNDAMENTALS

(BA/BSc/BCom/BBM/BCA/BSW)

BSc/BCom/BBM/BCA: I SEM

BA/BSW : III SEM

COMPUTER FUNDAMENTALS

(BA/BSc/BCom/BBM/BCA/BSW)

BSc/BCom/BBM/BCA: I SEM

BA/BSW : III SEM

2Hrs/week **Total: 30 hrs**

Unit 1: COMPUTER BASICS **5 hrs**

Evolution of computers, characteristics of computer, computer generations: first generation, second generation, third generation, fourth generation and fifth generation computers. Classification of computers: based on working principle, size and capability, computer applications: data processing, commercial, office automation, industry and engineering, healthcare, education, graphics and multimedia applications.

Unit 2: COMPUTER ORGNIZATION **6 hrs**

Block diagram of computer, computer memory: primary memory: Read Only Memory and Random Access Memory. Secondary memories- hard disk, floppy disk, compact disk, blue ray disk, pen drive, memory cord. Input devices: key board, mouse, OMR, OCR, MICR, BCR and scanner. Output devices: monitor (CRT ,LCD, LED), printers: impact and non impact printers, plotters.

Unit 3: NUMBER SYSTEM **3 hrs**

Introduction to number systems, positional and non positional number systems. Decimal, binary, octal and hexa decimal number systems and their conversation.

Unit 4: COMPUTER HARDWARE AND SOFTWARE **5 hrs**

Computer hardware**,** computer software-types of software: system software, application software, programming languages, low level and high level languages. Program translators: assemblers, compilers, interpreters.

Problem solving techniques: steps in problem solving techniques, algorithm: characteristics, examples, flowchart: flowchart symbols, examples.

Unit 5: COMPUTER NETWORKS AND INTERNET APPLICATIONS 3 hrs

Introduction, Types of Networks, Network Topology. LAN, WAN, MAN, Intranet and Internet, Internet applications, WWW, E-mail, browsing and searching. Search engines. Computer virus antivirus and surfing.

Unit 6. OPERATING SYSTEM 2 hrs

Introduction to OS, functions of OS, different views of OS, type of OS, DOS : internal and external commands.

Unit 7: MS-OFFICE 6 hrs

MS Word: Introduction to MS-Word, Editing a document, Formatting a document, Preview document, Printing a document, Find and Replace, Checking the grammar and Spelling , Word count, Header and footer, Auto correct and auto text, Drawing and insert objects, Table generation.

MS Excel: Worksheet basic, Creating worksheet, Entering text, Dates, alphanumeric and values, Tool bars and menus, Applying different formulas, Creating charts, Formatting of work sheet.

MS Power Point: Need of power point, Creating slides, Entering text, graphics, pictures and other objects, Tool bars and menus, Custom animation, Creating charts, Formatting of presentation.

Reference Books:

1. Computer Fundamentals: N. Mithili Devi and E. PadmaSri, SKYWARD Publishers.
2. Introduction to computer concepts: Pearson publication.
3. Computer Fundamentals : Anita Goel, Pearson publication.
4. Fundamentals of Computers, - V. Rajaraman.: PHI (EEE)
5. Microsoft office 2010: John Walkenbach, Herb Tyson, Michael R Groh, Faithe Wempen.
6. Microsoft office 2010 for windows : Steve Schwartz.

Scheme of evaluation:

Theory examination	**:**	**50marks**
IA marks	**:**	**Nil**
Total	**:**	**50 marks**

TUMKUR UNIVERSITY

Syllabus as per CBCS 2016-2017 under Semester Scheme

COMPUTER SCIENCE

Open Electives

Open Elective 1

BA/BSc: IV Sem
BCom/BBM/BCA: II Sem
Web Design (HTML)

2 Hrs/Week **Max Hours:30**

- **Chapter 1: HTML** **4 hrs**

The World Wide Web (WWW) and history of HTML, Hypertext and Hypertext Markup Language, Why HTML, Prerequisites.

- **Chapter 2 : HTML Documents** **6 hrs**

Dividing the document into 2 parts, Headers tags, Body tags, Delimiters, Tags, Elements, Attributes, Elements of an HTML Document , Text Elements, Tag Elements, Special Character elements, HTML Comments.

- **Chapter 3 : Structural elements of HTML documents** **5 hrs**

Header tags, Body tags, Heading tags, Inserting horizontal lines, Paragraphs, Breaks, Titles, Lists: Numbered List, Non-Numbered list, Definition list, Nested list, Marquee.

- **Chapter 4 :Formatting HTML Documents** **5 hrs**

Logical styles (source code, text enhancements, variables), Physical Styles (Bold, Italic, underlined, crossed)

- **Chapter 5 : Managing images in html** **5 hrs**

Image format (quality, size, type …), Importing images (scanners), Tags used to insert images, Frames, Hyperlinks.

- **Chapter 6 : Tables in HTML documents** **5 hrs**

Tags used in table definition, Tags used for border thickness, Tags used for cell spacing, Tags used for table size, Dividing table with lines, Dividing lines with cells. Cell types: Titles cell, Data cell.

Reference :

1. Robert W.Sebesta: Programming the World Wide Web, 4th Edition, Pearson Education, 2008
2. Web programming: Srikanth S, Skyward Publishers.

Open Elective 2

BA/BSc : IV Sem
BCom/BBM/BCA : II Sem

C Programming Language

2 Hrs/Week **Max Hours:30**

- **Chapter 1: Introduction to Programming Concepts 3 hrs**

Introduction, System software, Application software. Program Translators – Assembler, Interpreter and Compiler. Programming languages -Machine Level language, Assembly level language, High level language, Compare and contrast – Advantages and disadvantages.

- **Chapter 2: Algorithm and Flowchart 4 hrs**

Algorithm- Features, Advantages & disadvantages of algorithm, Flowchart – Symbols used in a flowchart, Steps involved in developing a flowchart with suitable examples, Advantages & disadvantages of flowchart.

- **Chapter 3: programming in C 4 hrs**

Introduction to C programming, features of C language, applications of C, advantages of C. Structure of C program and execution of C program.

- **Chapter 4: C Character Set 9 hrs**

C character set, C tokens: identifiers, keywords, variables, constants and operators . Types of constants- integer constants, float constants, single character constants and string constants Basic data types – int, char, float and double. Qualifiers – short, long, signed and unsigned. Declaration of variables, Assigning values to variables, Defining symbolic constants, Data type conversion: implicit and explicit. Operators-Arithmetic, Assignment, Relational, Logical, Conditional, Bitwise and Special operators. Expressions - Arithmetic expressions, Relational expressions, Logical expressions.

- **Chapter 5: Input and Output Operations 5 hrs**

Formatted and Unformatted Input/output functions. Format specifier for integers, floating point numbers, characters and strings. Escape sequences.

- **Chapter 6: Control structures** **5 hrs**

Types of controls structures-Conditional Statements-Simple if, if-else, nested if, else-if ladder, switch statements. Looping- while, do-while, for loop.

Reference Books:

1. Problem Solving with C -PHI(EEE). By - M.T.Somashekara.
2. Programming with C (Second edition) Byron S Gottfried , Schaum's Outlines (TMH)
3. Programming with C by K.R. Venugopal, Sudeep R Prasad TMH Outlines Series
4. Programming in ANSI C by Ram Kumar, Rakesh agrawal, TMH
5. Let us C by Yashwant Kanetkar, BPB