

KUVEMPU



UNIVERSITY

NEP-2020

curriculum structure and Syllabus

Bachelor of Science (Basic and Honors) Programme with  
Computer Science as Major and Minor Courses

And  
Open Elective courses in Computer Science

w.e.f Academic Year 2021-22 onwards

UG BOS IN COMPUTER SCIENCE

## The objectives of the Program

1. The primary objective of this program is to provide a foundation of computing principles for effectively using information systems and enterprise softwares.
2. It helps students analyze the requirements for system programming and exposes students for information systems
3. This programme provides students with options to specialize in various software system.
4. To produce outstanding Computer Scientists who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves
5. To provide opportunity for the study of modern methods of information processing and its applications.
6. To develop among students the programming techniques and the problem-solving skills through programming
7. To prepare students who wish to go on to further studies in computer science and related subjects.
8. To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications

## Program Outcomes

1. Discipline knowledge: Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity
2. Problem Solving: Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
3. Design and Development of Solutions: Ability to design and development of algorithmic solutions to real world problems.
4. Programming a computer: Exhibiting strong skills required to program a computer for various issues and problems of day-to-day scientific applications.
5. Application Systems Knowledge: Possessing a minimum knowledge to practice existing computer application software.
6. Communication: Must have a reasonably good communication knowledge both in oral and writing.
7. Ethics on Profession, Environment and Society: Exhibiting professional ethics to maintain the integrity in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
8. Lifelong Learning: Should become an independent learner. So, learn to learn ability.
9. Motivation to take up Higher Studies: Inspiration to continue educations towards advanced studies on Computer Science.

## Additional Program Outcomes for B.Sc (Hons) in Computer Science

The four years Bachelors in Computer Science (Hons) program enables students to attain the following additional attributes besides the afore-mentioned attributes:

1. Apply standard Software Engineering practices and strategies in real -time software project development
2. Design and develop computer programs/computer-based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics.
3. Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems
4. The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.
5. The ability to work independently on a substantial software project and as an effective team member.

## Curriculum Structure

Program: B.Sc. (Basic and Honors) Subject: Computer Science

1. Computer Science as MAJOR with another Subject as MINOR (Table IIA of Model Curriculum)

Sem	Discipline Specific Core Courses (DSC)	Hour of Teaching/ Week		Discipline Specific Elective Courses (DSE)/ Vocational Courses (VC)	Hour of Teaching / Week
		Theory	Lab		
1	DSC-1: Computer Fundamentals and Programming in C <b>DSC-1Lab:</b> C Programming Lab	4	4		
2	DSC-2: Data Structures using C <b>DSC-2Lab:</b> Data structures Lab	4	4		
3	DSC-3: Object Oriented Programming Concepts and Programming in JAVA <b>DSC-3Lab:</b> JAVA Lab	4	4		
4	DSC-4: Database Management Systems <b>DSC-4Lab:</b> DBMS Lab	4	4		
5	DSC-5: Programming in PYTHON DSC-6: Computer Networks <b>DSC-5Lab:</b> PYTHON Programming lab <b>DSC-6Lab:</b> Computer Networks Lab	3 3	4 4	VC-1: Any one from Vocational Courses, Group – 1*	3
6	DSC-7: Internet Technologies DSC-8: Operating System Concepts <b>DSC-7Lab:</b> JAVA Script, HTML, CSS Lab <b>DSC-8Lab:</b> C# Programming Lab	3 3	4 4	VC-2: Any one from Vocational Courses, Group – 2* <b>Internship:</b>	3 2
7	DSC-9: Computer Graphics and Visualization DSC-10: Design and Analysis of Algorithms DSC-11: Software Engineering <b>DSC-9Lab:</b> Computer Graphics and Visualization Lab <b>DSC-10Lab:</b> Algorithms Lab	3 3 3	4 4	DSE-1: Any one from Discipline Specific Elective Courses, Group – 1** DSE-2: Any one from Discipline Specific Elective Courses, Group – 2** <b>Research Methodology:</b>	3 3 3
8	DSC-12: Artificial Intelligence and Applications DSC-13: Computer Organization and Architecture DSC-14: Data Warehousing and Data Mining <b>DSC-12Lab:</b> AI Lab	3 3 3	4	DSE-3: Any one from Discipline Specific Elective Courses, Group – 3** <b>Research Project:</b>	3 6

2. Computer Science as MINOR with another Subject as MAJOR (As per Table IIA of Model Curriculum)

Sem	Discipline Specific Core Courses (DSC)	Hour of Teaching/ Week	
		Theory	Lab
1	DSC-1: Computer Fundamentals and Programming in C DSC-1Lab: C Programming Lab	4	4
2	DSC-2: Data Structures using C DSC-2Lab: Data structures Lab	4	4
3	DSC-3: Object Oriented Programming Concepts and Programming in JAVA DSC-3Lab: JAVA Lab	4	4
4	DSC-4: Database Management Systems DSC-4Lab: DBMS Lab	4	4
5	DSC-5: Programming in PYTHON DSC-5Lab: PYTHON Programming lab	3	4
6	DSC-6: Internet Technologies DSC-6Lab: JAVA Script, HTML, CSS Lab	3	4

\* Vocational Courses:

<p>Group-1:</p> <ul style="list-style-type: none"> <li>• DTP, CAD and Multimedia</li> <li>• Hardware and Server Maintenance</li> <li>• Web Content Management Systems</li> <li>• E-Commerce</li> <li>• Web Designing</li> </ul>	<p>Group-2:</p> <ul style="list-style-type: none"> <li>• Health Care Technologies</li> <li>• Digital Marketing</li> <li>• Office Automation</li> <li>• Multimedia Processing</li> <li>• Accounting Package</li> </ul>
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\*\* Discipline Specific Elective Courses:

<p>Group-1:</p> <ul style="list-style-type: none"> <li>• IoT</li> <li>• Cyber Law and Cyber Security</li> <li>• Web Programming - PHP and MySQL</li> <li>• Clouds, Grids, and Clusters</li> <li>• Software Testing</li> </ul>	<p>Group-2:</p> <ul style="list-style-type: none"> <li>• Information and Network Security</li> <li>• Data Compression</li> <li>• Discrete Structures</li> <li>• Opensource Programming</li> <li>• Multimedia Computing</li> <li>• Big Data</li> </ul>	<p>Group-3:</p> <ul style="list-style-type: none"> <li>• Data Analytics</li> <li>• Storage Area Networks</li> <li>• Pattern Recognition</li> <li>• Digital Image Processing</li> <li>• Parallel Programming</li> <li>• Digital Signal Processing</li> </ul>
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## Open Electives in Computer Science

Sl. No.	Semester	Open Electives
01	FIRST SEMESTER	<u>Any one from the following</u> <ul style="list-style-type: none"><li>• Office Automation</li><li>• Computer Fundamentals</li><li>• Problem Solving and C Programming Concepts</li></ul>
02	SECOND SEMESTER	<u>Any one from the following except elective chosen in the first semester</u> <ul style="list-style-type: none"><li>• Office Automation</li><li>• Computer Fundamentals</li><li>• Problem Solving and C Programming Concepts</li></ul>
03	THIRD SEMESTER	<u>Any one from the following</u> <ul style="list-style-type: none"><li>• Web Designing</li><li>• E-Commerce</li></ul>
04	FOURTH SEMESTER	<u>Any one from the following except elective chosen in the third semester</u> <ul style="list-style-type: none"><li>• Web Designing</li><li>• E-Commerce</li></ul>

# Syllabus for B.Sc. (Basic and Honors)

Semester: I

Course Code: DSC-1	Course Title: Computer Fundamentals and Programming in C
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

## Course Content

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Characteristics Computers, Evolution and History of Computers, Types of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples. (at least 5hrs)	10
Unit - 2	
Introduction to C Programming: Over View of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants. Input and output with C: Formatted I/O functions - <i>printf</i> and <i>scanf</i> , control stings and escape sequences, output specifications with <i>printf</i> functions; Unformatted I/O functions to read and display single character and a string - <i>getchar</i> , <i>putchar</i> , <i>gets</i> and <i>puts</i> functions.	8
Unit - 3	
C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.	12
Control Structures: Decision making Statements - <i>Simple if</i> , <i>if_else</i> , <i>nested if_else</i> , <i>else_if ladder</i> , <i>Switch-case</i> , <i>goto</i> , <i>break</i> & <i>continue</i> statements; Looping Statements - Entry controlled and exit controlled statements, <i>while</i> , <i>do-while</i> , <i>for</i> loops, Nested loops.	
Unit - 4	



<p>Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.</p> <p>Strings: Declaring &amp; Initializing string variables; String handling functions - <i>strlen</i>, <i>strcmp</i>, <i>strcpy</i> and <i>strcat</i>; Character handling functions - <i>toascii</i>, <i>toupper</i>, <i>tolower</i>, <i>isalpha</i>, <i>isnumeric</i> etc.</p> <p>Pointers in C: Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers;</p>	12
Unit - 5	
<p>User Defined Functions: Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.</p> <p>User defined data types: Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.</p>	10

#### Text Books

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. E. Balagurusamy: Programming in ANSI C (TMH)

#### References

1. Kamathane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI – EEE)
3. S. Byron Gottfried: Programming with C (TMH)
4. Kernighan & Ritchie: The C Programming Language (PHI)
5. Yashwant Kanitkar: Let us C
6. P.B. Kottur: Programming in C (Sapna Book House)

Course Code: DSC-1Lab	Course Title: C Programming Lab
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 04

#### Practice Lab

The following activities be carried out/ discussed in the lab during the initial period of the semester.

1. Basic Computer Proficiency
  - a. Familiarization of Computer Hardware Parts
  - b. Basic Computer Operations and Maintenance.
  - c. Do's and Don'ts, Safety Guidelines in Computer Lab
2. Familiarization of Basic Software – Operating System, Word Processors, Internet Browsers, Integrated Development Environment (IDE) with Examples.
3. Type Program Code, Debug and Compile basic programs covering C Programming fundamentals discussed during theory classes.

#### Programming Lab

##### Part A:

1. Write a C Program to read radius and find area and volume of a sphere.
2. Write a C Program to read three numbers and find the biggest of three
3. Write a C Program to demonstrate library functions in *math.h* (at least 5)
4. Write a C Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
5. Write a C Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
6. Write a C Program to read percentage of marks and to display appropriate grade (using switch case)
7. Write a C Program to find the roots of quadratic equation (if else ladder)
8. Write a C program to read marks scored in 3 subjects by n students and find the average of marks and result (Demonstration of single dimensional array)
9. Write a C Program to remove Duplicate Element in a single dimensional Array
10. Program to perform addition and subtraction of Matrices

##### Part B:

1. Write a C Program to find the length of a string without using built in function
2. Write a C Program to demonstrate string functions (at least 3).
3. Write a C Program to demonstrate pointers in C
4. Write a C Program to generate n prime number by defining *isprime ()* function
5. Write a C Program to find the trace of a square matrix using function
6. Write a C Program to read, display and multiply two matrices using functions
7. Write a C Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
8. Write a C Program to Reverse a String using Pointer
9. Write a C Program to demonstrate student structure to read & display records of n students.
10. Write a C Program to demonstrate the difference between structure & union.

Note: Student has to execute a minimum of 8 programs in each part to complete the Lab course

## Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

## Semester: II

Course Code: DSC-2	Course Title: Data Structures using C
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

### Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
- Demonstrate different methods for traversing trees
- Compare alternative implementations of data structures with respect to performance
- Describe the concept of recursion, give examples of its use
- Discuss the computational efficiency of the principal algorithms for sorting and searching

### Course Content

Content	Hours
Unit - 1	
Introduction to data structures: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures. Algorithm Specification, Performance Analysis, Performance Measurement Recursion: Definition; Types of recursions; Examples - Fibonacci numbers, GCD, Binomial coefficient $nCr$ , Towers of Hanoi; Comparison between iterative and recursive functions.	8
Unit - 2	
Arrays: Basic Concepts – Definition, Declaration, Initialization, Operations on arrays; Types of arrays; Arrays as abstract data types (ADT); Representation of Linear Arrays in memory; Traversing linear arrays; Inserting and deleting elements; Sorting – Selection sort, Bubble sort, Quick sort, Insertion sort, merge sort; Searching - Sequential Search, Binary search; Iterative and Recursive searching; Multidimensional arrays; Representation of multidimensional arrays; Sparse matrices.	12

Unit - 3	
Stacks: Basic Concepts – Definition and Representation of stacks; Operations on stacks; Applications of stacks; Infix, postfix and prefix notations; Conversion from infix to postfix using stack; Evaluation of postfix expression using stack; Application of stack in function calls. Queues: Basic Concepts – Definition and Representation of queues; Types of queues – Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues;	10
Unit - 4	
Dynamic memory allocation: Static & Dynamic memory allocation; Memory allocation and de- allocation functions - malloc, calloc, realloc and free. Linked list: Basic Concepts – Definition and Representation of linked list, Types of linked lists - Singly linked list, doubly linked list, Header linked list, Circular linked list; Representation of Linked list in Memory; Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion; Memory allocation; Garbage collection	12
Unit - 5	
Trees: Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degree of a node, level, edge, path, depth; Binary tree: Type of binary trees - strict binary tree, complete binary tree, binary search tree and heap tree; Array representation of binary tree. Traversal of binary tree; preorder, inorder and postorder traversal; Reconstruction of a binary tree when any two of the traversals are given.	10

#### Text Books

1. Sartaj Sahani: Fundamentals of Data Structures

#### References

1. Tanenbaum: Data structures using C (Pearson Education)
2. Kamathane: Introduction to Data structures (Pearson Education)
3. Y. Kanitkar: Data Structures Using C (BPB)
4. Sudipa Mukherjee: Data Structures using C – 1000 Problems and Solutions (McGraw Hill Education, 2007))

Course Code: DSC-2Lab	Course Title: Data Structures Lab
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 04

### Programming Lab

#### Part A:

1. Write a C Program to find GCD using recursive function
2. Write a C Program to display Pascal Triangle using binomial function
3. Write a C Program to generate n Fibonacci numbers using recursive function.
4. Write a C Program to implement Towers of Hanoi.
5. Write a C Program to implement dynamic array, find smallest and largest element of the array.
6. Write a C Program to read the names of cities and arrange them alphabetically using bubble sort.
7. Write a C Program to sort the given list using selection sort technique.
8. Write a C Program to sort the given list using insertion sort technique.

#### Part B:

1. Write a C Program to sort the given list using quick sort technique.
2. Write a C Program to sort the given list using merge sort technique.
3. Write a C Program to search an element using linear search technique and recursive binary search technique.
4. Write a C Program to implement Stack.
5. Write a C Program to convert an infix expression to postfix.
6. Write a C Program to implement simple queue.
7. Write a C Program to implement linear linked list.
8. Write a C Program to implement traversal of a binary tree.

## Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

## BSc-Semester-III

Course Title: Object Oriented Programming Concepts and Programming in Java	Course code: DSC-3
Total Contact Hours: 52	Course Credits: 04
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

### Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Understand the features of Java and the architecture of JVM
- Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done
- Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance
- The students will be able to demonstrate programs based on interfaces and threads and explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Language
- Write, compile, execute Java programs that include GUIs and event driven programming and also programs based on files

### DSC-3: Object Oriented Programming Concepts and Programming in Java

Unit	Description	Hours
1	OOPs Concepts: Basics of OOPs: Object, Class, Data abstraction, Data Hiding, Polymorphism, Inheritance;  Introduction to Java: Basics of Java programming, Data types, Variables, Operators, Control structures: Branching, Looping, Labeled Loop; Arrays (1D,2D).	12
2	Object and Classes: Basics of Objects and Classes, Constructors-Definition and Types; Destructors, Finalizer, Visibility modifiers, Java Overloading, Inbuilt classes: String, Character, String Buffer.	09
3	INHERITANCE AND INTERFACES: Inheritance: Definition, Types: Single, Multilevel, hierarchical; Interface: Definition Extending & implementing interface, Generic Programming, Introduction to Package in java.	09
4	Multithreading and Exceptions: Creating a thread, Extending the thread class, stopping and blocking the thread, Thread life cycle, Runnable interface, Exception handling with try-catch-finally, Throwing and Rethrowing exceptions classes, Multiple catch statements, finally clause.	10

5	Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components: Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Menus, Dialog Boxes, Applet and its life cycle, Introduction to swing.	12
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#### Text Books

1. Programming with Java, By E Balagurusamy – A Primer, Fourth Edition, Tata McGraw Hill Education Private Limited.
2. Core Java Volume I – Fundamentals, By Cay S. Horstmann, Prentice Hall
3. Object Oriented Programming with Java : Somashekara, M.T., Guru, D.S., Manjunatha, K.S

#### Reference Books:

1. Java 2 - The Complete Reference – McGraw Hill publication.
2. Java - The Complete Reference, 7th Edition, By Herbert Schildt– McGraw Hill publication.



Course Code: DSC-3Lab	Course Title: JAVA LAB
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 03

#### Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Implement Object Oriented programming concept using basic syntaxes of control Structures
- Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- Demonstrates how to achieve reusability using inheritance
- Demonstrate understanding and use of interfaces, packages, different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- Identify and describe common user interface components to design GUI in Java using Applet & AWT along with response to events

#### Practice Lab

1. Program to print the following triangle of numbers 1  
1 2  
1 2 3  
1 2 3 4  
1 2 3 4 5
2. Program to simple java application, to print the message, "Welcome to java"
3. Program to display the month of a year. Months of the year should be held in an array.
4. Program to find the area of rectangle.
5. program to demonstrate a division by zero exception
6. Program to create a user defined exception say Pay Out of Bounds.

#### Programming Lab

##### PART A: Java Fundamentals OOPs in Java

1. Program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.
2. Program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function should access the methods and perform the mathematical operations.
3. Program with class variable that is available for all instances of a lass. Use static variable declaration. Observe the changes that occur in the object's member variable values.

4. Program to create a student class with following attributes; Enrollment No: Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of n student objects and display the details.
5. In a college first year class are having the following attributes Name of the class (BCA, BCom, BSc), Name of the staff No of the students in the class, Array of students in the class. Define a class called first year with above attributes and define a suitable constructor. Also write a method called best Student () which process a first-year object and return the student with the highest total mark. In the main method define a first-year object and find the best student of this class
6. Program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of appointment. ie, print them as per their seniority.

#### PART B: Exception Handling & GUI Programming

1. Program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
2. Program which create and displays a message on the window
3. Program to draw several shapes in the created window
4. Program which creates a frame with two buttons father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother also appear.
5. Program to move any one shape according to the arrow key pressed.
6. Program to create a window when we press M or m the window displays Good Morning, A or a the window displays Good After Noon E or e the window displays Good Evening, N or n the window displays Good Night
7. Demonstrate the various mouse handling events using suitable example.
8. Program to create menu bar and pull-down menus.

#### Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

## BSc-Semester-IV

Course Title: Database Management Systems	Course code: DSC-4
Total Contact Hours: 52	Course Credits: 04
Formative Assessment Marks: 40	Duration of SEE/Exam: 03 Hours
Summative Assessment Marks: 60	

### Course Outcomes (COs):

At the end of the course, students will be able to:

- Explain the various database concepts and the need for database systems.
- Identify and define database objects, enforce integrity constraints on a database using DBMS.
- Demonstrate a Data model and Schemas in RDBMS.
- Identify entities and relationships and draw ER diagram for a given real-world problem.
- Convert an ER diagram to a database schema and deduce it to the desired normal form.
- Formulate queries in Relational Algebra, Structured Query Language (SQL) for database manipulation.
- Explain the transaction processing and concurrency control techniques.

### Database Management Systems (DBMS)

Unit	Description	Hours
1	Database Architecture: Introduction to Database system applications. Characteristics and Purpose of database approach. People associated with Database system. Data models. Database schema. Database architecture. Data independence. Database languages, and classification of DBMS.	10
2	E-R Model: Entity-Relationship modeling: E – R Model Concepts: Entity, Entity types, Entity sets, Attributes, Types of attributes, key attribute, and domain of an attribute. Relationships between the entities. Relationship types, roles and structural constraints, degree and cardinality ratio of a relationship. Weak entity types, E -R diagram.	10
3	Relational Data Model: Relational model concepts. Characteristics of relations. Relational model constraints: Domain constraints, key constraints, primary & foreign key constraints, integrity constraints and null values. Relational Algebra: Basic Relational Algebra operations. Set theoretical	12

4	<b>SQL and Data Normalization:</b> SQL – DML, DDL, DCL and TCL commands, Aggregate Functions and Grouping. Nested Sub Queries, Views. Normalization - Anomalies in relational database design. Decomposition. Functional dependencies. Normalization. First normal form, Second normal form, Third normal form. Boyce-Codd normal form.	10
5	<b>Introduction to PL/SQL programming:</b> Introduction to PL/SQL • Features and Advantages, PL/SQL Blocks - basic syntax, Variables and their scope, Constants, Literals, Data Types, Operators, Executable Statements. <b>Control Execution Flow</b> • Conditional Control: IF Statements • CASE Statements • Iterative Control: Basic Loops -WHILE and FOR Loops, Reverse FOR LOOP Statement, Nested Loops, Labeling a PL/SQL Loop, exception handling. STRINGS: Declaring String Variables, String Functions and Operators, ARRAYS: Creating a Varray Type. Cursors - Implicit and Explicit Cursors, Cursor Attributes, parameterized Cursor, Functions and procedure – syntax and usage.	10

References:

1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson, 2015
2. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
3. Introduction to Database System, C J Date, Pearson, 1999.
4. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6<sup>th</sup> Edition, McGraw Hill, 2010.
5. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3<sup>rd</sup> Edition, McGraw Hill, 2002
6. Oracle Database 11G PL/SQL Programming

Course Code: DSC-4Lab	Course Title: DBMS LAB
Course Credits: 02	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 03

#### Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Formulate query, using SQL, solutions to a broad range of query and data update problems
- using SQL in database creation and interaction
- Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system
- Use a desktop database package to create, populate, maintain, and query a database.
- Analyze an information storage problem and derive an information model expressed in the form and views
- Formulate PL SQL query blocks using cursor

#### Programming Lab

##### PART A: SQL Queries

1. Implementation of DDL and DML commands of SQL with suitable examples
  - a) Create table b) Alter table c) Drop Table 4) Insert 5) Update 6) Delete
2. Implementation of different types of constraints.
3. Implementation of different types of Joins
  - a) Inner Join b) Outer Join c) Natural Join
4. Study and Implementation of
  - a) Group By & having clause b) Order by clause
5. Implementation of Views
6. Execute DCL and TCL Commands

##### PART B: PL/SQL

1. Create a library table with attributes book id, author\_name, publisher, price and edition. Write PL/SQL code block to accept the publisher's name and count number of books under that publisher and display it. Also display the publisher with maximum publication.
2. Write a function to display employee name with distinct salaries  
For eg.  
if a 's salary is 100  
b 's salary is 200  
c 's salary is 100 display either (a or c) and b
3. Write a function to rank the employees based on their salary (use RANK function)
4. Write a function to validate the Employee email id.
5. Write a procedure to capture the error log in a table in case of an exception using

autonomous transaction, from employee table, store ename and salary in varrays and display the contents of the arrays in table format.

6. Write an Anonymous block which raise a user defined exception on Thursday?
7. Write a PL/SQL cursor program which is used to calculate total salary from emp table
8. without using sum () function?

#### Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program -1 from Part A	Write up of the program -1	5
Program -2 from Part B	Write up of the program -2	5
Execution and formatting (Any one program)		10
Viva Voce based on Lab Activities		05
Total		25

## Syllabus for Open Electives in Computer Science:

Course Code: CSOE-1	Course Title: Computer Fundamentals
Course Credits: 03	Hour of Teaching/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03

### Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
- Web Programming basics, introduction of HTML and CSS programming
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

### Course Content

Content	Hours
Unit - 1	
Fundamentals of Computers: Introduction to Computers - Computer Definition, Evolution and History of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples(at least 5 hours of teaching .	10
Unit-2	

Introduction to Computer: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Super computers. Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Storage units, Input and output Devices. How CPU and memory works. Program execution with illustrative examples. Introduction to microcontrollers.	10
Unit-3	
Operating System Fundamentals: Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities, The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting.	08
Unit-4	
Introduction to Database Management Systems: Database, DBMS, Why Database - File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL	08
Unit-5	
Internet Basics: Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System. Web Basics: Introduction to web, web browsers, http/https, URL, HTML5, CSS	06

Text Books:

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. David Riley and Kenny Hunt, Computational thinking for modern solver, Chapman & Hall/CRC,

Reference:

1. J. Glenn Brook shear, "Computer Science: An Overview", Addison-Wesley, Twelfth Edition,
2. R.G. Dromey, "How to solve it by Computer", PHI,



Course Code: CSOE-2	Course Title: Problem Solving and C Programming Concepts
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

### Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

1. Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers
2. Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting
3. Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in
4. Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
5. Web Programming basics, introduction of HTML and CSS programming
6. Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

### Course Content

Content	Hours
Unit – 1	
Problem Solving Techniques: Problem solving techniques – problem definition, analysis, design, debugging, testing, documentation and maintenance. Design Tools - ALGORITHM: definition, characteristics, advantages and disadvantages. FLOWCHART - definition, symbols, advantages and disadvantages. Writing an algorithm and flowchart: Area of circle, arithmetical operations, simple interest and compound interest, quadratic equation, largest of three numbers, sum of N natural numbers, factorial of number, Fibonacci series, prime number, reverse a given number, evaluation of series like $\sin(x)$ , $\cos(x)$ , $e^x$ , $\log(x)$ etc.	10
Unit-2	

Introduction to C Programming: Overview of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C.  C Programming Basic Concepts: C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants, Formatted I/O functions - printf and scanf,	10
Unit-3	
C Operators & Expressions: Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.	08
Unit-4	
Decision making, branching and looping: Decision making - if and if-else statement, nested if, else if ladder, switch statements, conditional operator, goto statement. Looping - while, do-while and for, nested for. break and continue statements. Programs on these concepts.	08
Unit-5	
Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.	06

#### References:

1. Computer Concepts and Programming, Padma Reddy
2. Let us C , Yashwanth Kanetkar
3. Ansi C, Balagurusamy
4. Problem solving with C, M. T. Somashekara and D. S. Guru

Course Code: CSOE03	Course Title: Office Automation
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

### Course Content

Content	Hours
Unit – 1	
Windows Desk top - GUI: Definition, Standards, Cursors/Pointers, Icons, GUI Menus, GUI-Share Data – Desktop icons and their functions: My computer, My documents, Network neighbourhood, Recycle Bin, Quick launch tool bar, System tray, Start menu, Task bar – Dialog Boxes: List Box, Spin Control Box, Slide, Drop-down list, Radio button, Check box, Text box, Task Bar - System Tray - Quick launch tool bar - Start button - Parts of Windows -Title bar-Menu bar - Scroll bar-Status bar, Maximize, Minimize, close and Resize & Moving a Window – Windows - Start Menu –Help Menu- Preview Menu; Logoff & Shutdown – Keyboard Accelerators: Key board short keys or hotkeys	06
Unit-2	
MS Word - Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help, Formatting Documents - Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering. Setting Page style - Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page. Creating Tables-Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting,	10

Sorting, and Formula, Drawing - Inserting ClipArt, Pictures/Files etc., Tools – Word Completion, Spell Checks, Mail merge, Templates, Printing Documents – Shortcut keys.	
Unit-3	
MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, saving files, setting Margins, converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders & Shading – Shortcut keys. Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal. Creating Charts - Drawing. Printing. Using Tools	10
Unit-4	
MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts. Creating a presentation - Setting Presentation style, Adding text to the Presentation. Formatting a Presentation - Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw. Adding Effects to the Presentation- Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.	10

Unit-5	
Internet and Web Browsers: Definition of Web Addressing-URL-Different types of Internet Connections; Dial up connection, Broad band ( ISDN, DSL, Cable), Wireless ( Wi-Fi, WiMax, Satellite, Mobile) naming convention, browsers and its types, internet browsing, searching - Search Engines - Portals - Social Networking sites- Blogs - viewing a webpage, downloading and uploading the website; Creating an email-ID, e-mail reading, saving, printing, forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc.	06

References:

1. Fundamentals of computers - V.Rajaraman - Prentice- Hall of india
2. Microsoft Office 2007 Bible - John Walkenbach,Herb Tyson,Faithe Wempen,cary N.Prague,Michael R.groh,Peter G.Aitken, and Lisa a.Bucki -Wiley India pvt.ltd.
3. Computer Fundamentals - P. K. Sinha Publisher: BPB Publications.
4. Computer & Internet Basics Step-by-Step - Etc-end the Clutter - Infinity Publishing.
5. <https://en.wikipedia.org>
6. <http://windows.microsoft.com/en-in/windows/windows-basics-all-topics>

## Open Elective

THIRD SEMESTER :

### ELECTRONIC COMMERCE

Course Code: CSOE04	Course Title: E-Commerce
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

Course Outcomes (COs):

- Compare how internet and other information technologies support business processes.
- Demonstrate an overall perspective of the importance of application of internet technologies in business administration
- Explain the basic business management concepts.
- Demonstrate the basic technical concepts relating to E-Commerce.
- Identify the security issues, threats and challenges of E-Commerce.

Content	Hours
Unit – 1	
Introduction to E-Commerce and Technology Infrastructure  Working of Web - HTML Markup for Structure - Creating simple page - Marking up text - Adding Links - Adding Images - Table Markup - Forms – HTML	9
Unit-2	
Building an E-Commerce Website, Mobile Site and Apps: Systematic approach to build an E-Commerce: Planning, System Analysis, System Design, Building the system, Testing the system, Implementation and Maintenance, Optimize Web Performance – Choosing hardware and software – Other E-Commerce Site tools – Developing a Mobile Website and Mobile App	10
Unit-3	
E-Commerce Security and Payment Systems: E-Commerce Security Environment – Security threats in E-Commerce – Technology Solutions: Encryption, Securing Channels of Communication, Protecting Networks,	09

Protecting Servers and Clients – Management Policies, Business Procedure and Public Laws- Payment Systems	
Unit-4	
Business Concepts in E-Commerce: Digital Commerce Marketing and Advertising strategies and tools – Internet Marketing Technologies – Social Marketing – Mobile Marketing – Location based Marketing – Ethical, Social, Political Issues in E-Commerce	09
Unit-5	
Project Case Study: Case Study: Identify Key components, strategy, B2B, B2C Models of E-commerce Business model of any e-commerce website - Mini Project : Develop E-Commerce project in any one of Platforms like Woo-Commerce, Magento or OpenCart	05

Text Book:

1. Kenneth C. Laudon, Carol Guercio Traver - E-Commerce, Pearson, 10th Edition, 2016

References:

1. <http://docs.opencart.com/>
2. <http://devdocs.magento.com/>
3. <http://doc.prestashop.com/display/PS15/Developer+tutorials>
4. Robbert Ravensbergen, –Building E-Commerce Solutions with Woo Commerce||,PACKT, 2nd Edition

## WEB DESIGNING

Course Code: CSOE05	Course Title: Web Designing
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 03 Hours

### Course Outcomes (COs):

- Students can understand the basics of internet technology.
- Demonstrate the various tags useful to create a web page.
- Write HTML and understand how to effectively implement it in the web environment.
- Write CSS effectively to create well organized, styled web pages.

Content	Hours
Unit – 1	
Internet Basics: Basic concepts, communicating on the Internet, Internet Domains, Internet server identities – Registering a virtual domain with inter NIC, Domain Name Extension, establishing connectivity on the internet, Client IP Address – How Client IP Address are assigned, How ISPs achieve the task of assigning IP Address, How IP Address came into existence, A brief overview of TCP/IP and its services – Internet Protocol, Transmission control protocol – world wide web, FTP, Telnet.	08
Unit-2	
Introduction to HTML - Information files creation, Web server, Web browser – understanding how a browser communicates with a web server, establish connection, Client issues a request and sends a response, server terminates the connection.	10
Unit-3	
HTML: HTML tags, Paired tags, Singular tags, Structure of HTML program – Head, Body, Title and footers, Text Formatting tags – Paragraph breaks, line breaks, Head styles, Drawing Lines, Text Styles – Bold, Italic, Underline, Centering (Text, Images., etc). Lists: Types of Lists: Unordered list (Bullets), Ordered list (Numbering), Definition list Adding Graphics to HTML document: Using the border attribute, width and height attribute, align attribute, alt attribute. Tables: Introduction, the caption tag, Using the width and border attribute, cellpadding attribute, cellspacing attribute, the background-color property, the colspan and Rowspan attribute.	08



Unit-4	
Linking Documents: External document references, Internal document references, hyper linking to a HTML FILE, Images as Hyperlinks. Frames: Introduction to frames- frameset tag, frame tag	08
Unit-5	
Dynamic HTML(DHTML): CSS (Cascading Style Sheets) – Font attributes, color and background attributes, Text attribute, Border attribute, Margin attributes, List attribute, Using the span and div tags, External Style Sheets.	08

Text Book:

1.HTML, JavaScript, DHTML and PHP – Ivan Bayross 4<sup>th</sup> edition

References:

1.<https://www.w3schools.com/TAgS/default.asp>

2.<https://w3schools.sinsixx.com/dhtml/>

3.Web Design With HTML & CSS: HTML & CSS Complete Beginner's Guide – Prem Kumar

## Pattern of continuous Evaluation and Semester End Examination

Total Marks for each course = 100

Continuous assessment (C1) = 20 marks

Continuous assessment (C2) = 20 marks

Semester End Examination (C3) = 60 marks

i. Formative evaluation process (Internal Assessment).

a. The first component (C1) of assessment is for 20 marks. This shall be based on tests, assignments, seminars, case studies, fieldwork, project work etc. This assessment and score process should be completed after completing 50% of the syllabus of the course/s and within 45 working days of the semester program.

b. The second component (C2) of assessment is for 20 marks. This shall be based on the test, assignment, seminar, case study, fieldwork, internship / industrial practicum/project work etc. This assessment and score process should be based on the completion of the remaining 50 per cent of the syllabus of the courses of the semester.

Summative evaluation process (Semester End theory Examination).

During the 17th – 19th week of the semester, a semester-end examination shall be conducted by the University for each course. This forms the third and final component of assessment (C3) and the maximum marks for the final component will be 60 marks.

Practical Examination: For the practical course of full credits, marks shall be for 50 marks awarded as follows

Internal Assessment for 25 Marks: 15 Marks for maintaining Practical record and 10 marks for practical test. Test shall be conducted after the completion of Practical Classes.

End Semester Practical Examination: End Semester Practical examination shall be conducted for 25 marks.

**QUESTION PAPER PATTERN FOR DEGREE COURSES**  
**(DSC, OE and Languages)**

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**First Semester ..... Degree Examination, April/May 2022**  
**(CBCS NEP Scheme)**

**Paper: DSC/OE/Languages .....**

**Time: 02 Hours**

**Max. Marks: 60**

I. Select the most appropriate answer from the options provided: 10 x 1 = 10

1).....

a)

b)

c)

d)

2).....

a)

b)

c)

d)

.

.

.

10).....

a)

b)

c)

d)

II. Answer/Write short notes on any **FIVE** of the following: 05 x 03 = 15

1)

2)

3)

4)

5)

6)

7)

8)

III. Answer any **THREE** questions from the following: 03 x 05 = 15

1)

2)

3)

4)

5)

IV. Answer the following\* 02 x 10 = 20

1) .....

OR

.....

2) .....

OR

.....

\*May have sub questions if required

<b>Syllabus Distribution for Question Paper Setting</b>		
<b>Section-I</b>	Ten Questions of each carrying 02 marks	Two questions from each unit
<b>Section -II</b>	Eight Questions of each carrying 03 marks	At least one question from each unit and remaining questions from those units with higher teaching hours
<b>Section -III</b>	Five Questions of each carrying 05 marks	At least one question from each unit.
<b>Section -IV</b>	Four Questions of each carrying 10 marks	First question from unit-1 or Second question from unit-2 ----- Third question from unit-3 or Fourth question from unit-4 &unit-5