

**Syllabus of
B.Sc. (Computer Science)
Part II (Semester-IV)**

COMPUTER SCIENCE BOARD

**Prepared by Dr. S.B. Kishor
Chairman, Computer Science Board**



**GONDWANA UNIVERSITY,
GADCHIROLI
SESSION 2013-2014**

B.Sc. II (Computer Science) SEMESTER- IV

Paper-1 : DATA STRUCTURES

Paper-2 : EVENT DRIVEN PROGRAMMING WITH VISUAL BASIC

B.Sc. II (Computer Science)
SEMESTER-IV
Paper-I: Data Structures

(Marks-50)

UNIT I: Introduction to Data Structures

Data Structure and Algorithms- Introduction, Data Structures, Fundamentals of DS, Operations on Data Structure

Arrays – Introduction, Memory/Storage Representation of One and Two Dimensional Array,

Sorting- Definition of Sorting, Comparison of Sorting Method, Bubble Sort, Insertion Sort, Selection Sort, Merging.

Searching- Definition, Type of Searching (Binary Search, Linear Search.)

UNIT II: Stacks and Queue

Stacks- Introduction & Definition, Application of Stack, Various Representation of Stack, Operation on stack (Push and Pop) Hierarchy of Operation, Representation of Arithmetic Expression (Infix, Postfix, Prefix) Multiple Stack. Evaluation of postfix expressions and their conversions

Queues- Introduction, Applications of Queue, Various Representations of Queue, Operation on queue. Concept of Deque, Priority Queues, Circular Queue.

UNIT III: Recursion and Link List

Recursion- Introduction, Recursion Properties, Applications of Recursion (Factorial, Addition of Two Number, Power of A Number, Fibonacci Series, Multiplication of Two Number, Tower of Hanoi.) Advantages and Disadvantages of Recursion.

Linked List- Introduction, Application of Linked List, and Representation of Linked List, Operation on Linked List (Inserting, Removing, Reversing, Searching, Sorting). Concept of Double Linked List.

UNIT IV: Tree and Graphs

Trees- Introduction, Definition of Trees, Binary Tree, Type of Binary Tree, Operation on Binary Tree, Traversal of Binary Tree, Binary Search Tree (BST), Expression Trees, Memory Representation of Binary Tree

Graphs: - Definition of Graph, Various Terminology Used in Graph, Sequential Representation of Graph, Path Matrix, Spanning Tree, and Minimum Spanning Tree (Kruskal Algorithm, PRIM'S Algorithm), Traversing a Graph.

Books:

- 1) LipschutzSchaum's "Data Structure" Outline Series [TMH].ISBN-0-07-060168-2
- 2) D. Samanta, "Classical Data Structure", Prentice Hall India, ISBN: 8120318749
- 3) Dr. S.B. Kishor, "Data Structures", Das Ganu ,4th Edition, 2011, ISBN-978-81-921757-4- 4

References:

- 1) Tenenbaum," Data Structures Using C and C++", Second Edition, Prentice Hall India, New Delhi. ISBN-81317-0328-2
 - 2) Deshpande and Kakade, "C and Data Structure", Dramatic Pub..ISBN-81-7722424-7
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B.Sc. II (Computer Science)
SEMESTER - IV
Paper II: Event Driven Programming with Visual Basic

(Marks-50)

UNIT-I: Introduction to Visual Basic

Integrated Development Environment (IDE) – Features, Event driven programming,
Programming Constructs: Data Types, Variable, Constant, Operator, System defined Function, Dialog Box and Creating User Interface

Control flow statement: if-then, select-case, for-next, while wend, do-loop statement. With..End, Type of Event.

UNIT-II: VB Control and Procedure

Visual Basic Control: Form, Label, Textbox, Frame, Checkbox, Option Button, ListBox, ComboBox, Timer, Scrollbar, Picture, Image, File Controls, Artwork control

ActiveX Control: Tab Strip, Status Bar, Slider, Month View, DTPicker, Rich Text Box, Common Dialog

Procedure: Types of Procedure, Subroutine, Function, Module

UNIT-III: Menu, Interface and Array

Menu: Menu Editor, Creating Menus, Utility features provided by menu editor, modifying menu at run time, pop-up menu, Creating Toolbar using Image List

Interface: SDI, MDI,

Array: One Dimensional Array, Built-in Array function, For..Each Loop, Arrays Types

UNIT-IV: ActiveX Data Object

Data & ADODC Control, Connecting ADODC to Bound Control, Use of ADO Object, ADO Architecture, ADO Object Methods for Editing, Updating and Searching
Data Environment, Data Report,

Debugging and Error Handling: Types of Error, Debugging, Handling Run Time Error.

Books:

- 1) Steve Brown, "Visual Basic 6.0 Complete", Complete Idiot's Books, ISBN 978-0789718129
- 2) Dr. S.B. Kishor, "Front End Development using Visual Basic", Das GanuPrakashan, ISBN 978-93-81660-0-5
- 3) Evangelos Petroustos, "Mastering Visual Basic 6", BPB, 2005 ISBN-81-7635-269-1.
- 4) Moel Jerke, "Complete Reference Visual Basic 6", TMH, 2004, ISBN -0-07-463666-9.

References:

- 1) Peter Norton's, "Visual Basic 6.0", SAMS tec-Media, 2006, ISBN-81-7635-150-4
- 2) Michael Halvorson, "Learn Visual Basic 6.0 Now", PHI, ISBN 0-7356-0729-X
- 3) Michael Vine, "Visual Basic Programming – For Absolute Beginner", PHI, ISBN: 0761535535
- 4) Paul Sheriff, "Teaches Visual Basic 6", PHI, 978-8120315624

B.Sc. II (Computer Science)
SEMESTER-IV
Practical -I: Data Structures

- 1) To delete an element from K^{th} position of Array.
- 2) To insert an element ITEM at K^{th} position of Array.
- 3) To insert an element Item in Sorted Array.
- 4) To implement the operation of Push, Pop and to know the status of stack.
- 5) An algorithm to check the status of stack.
- 6) To find factorial of a number using Recursion.
- 7) To find multiplication of two number using Recursion.
- 8) To simulation the game of Tower of Hanoi using recursion.
- 9) To implement the operation of insertion and deletion on Queue.
- 10) A menu driven program to implement the operation of addition, deletion, searching, traversing, reversion, sorting, counting number of nodes and at the end erasing the link list.
- 11) Implementation of stack using linked list.
- 12) Implementation of Queue using linked list.
- 13) To create binary search tree, traverse it and find number of leaves and total nodes in the Tree.
- 14) To arrange the list of number in a Sorted order using Merge Sort.
- 15) To arrange the list of number in the Sorted order using Quick sort.
- 16) To check all the element of list is in sorted order or not.
- 17) To search an element using sequential or linear search .At the end display time required to search an element including number of comparison.
- 18) To search an item position in sorted list (Binary search).

**B.Sc. II (Computer Science)
SEMESTER - IV**

Paper II: Event Driven Programming with Visual Basic

- 1) Design a form to accept First, Middle and Last Name and display the full name (Concatenate three text box) on Label when user click on Command Button.
- 2) Design an application that gives five choices of colors. Design an application to choose any one color using option button and change the Fore Color of Textbox.
- 3) Write an application to add and remove the name of city from combo box
- 4) Design a VB screen, to display current time in digital format continuously after every one second and change the background color of form.
- 5) Build the application, which marquee the caption of Form
- 6) Build the application, to convert the Fahrenheit temperature selected through scrollbar value into corresponding temperature is Celsius.
- 7) Build a application that collects marks for five different subjects. Calculate total, If total is ≥ 500 display message " You are allowed" otherwise display "You are not allowed."
- 8) A book stall gives discount on the books as per the following conditions,

No. of Books Purchased	Discount
≤ 5	Nil
> 5 and ≤ 10	10%
> 10 and ≤ 15	12%
> 15	20%

Create a form as follows to calculate the Discount

- 9) Build the VB application that converts a number entered into the Textbox to Octal, Hexadecimal and Decimal.
- 10) Build the application; to accept the password within time limit say 8 second otherwise display a message time elapsed.
- 11) Build the application using timer for personal appointment remainder while working with computer system.
- 12) Evaluate following $\sin(x)$ series
$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \dots$$
- 13) Build the application, to change the color of Frame using RGB function from the values that are set by 3 Scroll bars.
- 14) Build a Calculator application to perform basic arithmetic operation
- 15) Build the application, to accept the temperature of Number of days passed in the current month and determines the highest and average temperature.
- 16) Demonstrate the working of data bound controls
- 17) Create a data bound control application to perform various data operation using DAO Control. Assume Database Name and Table Name is Donor having 4 fields Donor_Number, Donor_Name, Date_of_Birth, Donor_Blood and Sex.
- 18) Create a data bound control application to perform various data operation using ADO Control. Assume Database Name and Table Name is Donor having 4 fields Donor_Number, Donor_Name, Date_of_Birth, Donor_Blood and Sex.
- 19) Write an application to divide the number by another and it must be able to handle any error that may arise during run time.