

**MANGALORE UNIVERSITY**  
**Bachelor of Computer Applications (BCA) Degree Programme**  
**Choice Based Credit System (2019-2020 Onwards)**  
**III Semester – Detailed Syllabus**

<b>Group I Course 7</b>	<b>BCAC 231</b> <b>Operating System and Linux</b>	<b>I.A.: 20</b>
<b>Theory/Week: 4 Hours</b>		<b>Exam: 80</b>
<b>48 Hours</b>		<b>Credits: 2</b>

Topic	Chapter No.	Sections
<b>UNIT I</b>		
<p><b>Introduction:</b> Operating System, Simple Batch Systems, Multi programmed Batched Systems, Time Sharing Systems, Real-Time Systems, Multi-processor Systems.</p> <p><b>System Components, Operating System Services.</b></p> <p><b>Process:</b> Process Concept, Process Scheduling, Cooperating Process.</p> <p><b>Threads:</b> Thread Concept, Single and Multiple Threads, Benefits.</p> <p><b>CPU Scheduling:</b> Basic Concepts, Scheduling Criteria, Scheduling Algorithms.</p> <p><b>Process Synchronization:</b> The Critical Section Problem, Semaphores.</p>	<b>Book 1</b>	<p><b>Chapter 1:</b> 1.1, 1.1.1, 1.1.2, 1.2, 1.2.1, 1.2.2, 1.2.3, 1.4, 1.7.</p> <p><b>Chapter 3:</b> 3 3.1, 3.1.1 to 3.1.8, 3.2.</p> <p><b>Chapter 4:</b> 4.1, 4.1.1 to 4.1.4, 4.2, 4.2.1 to 4.2.3, 4.4.</p> <p><b>Chapter 5:</b> 5.1, 5.1.1 to 5.1.3.</p> <p><b>Chapter 6:</b> 6.1, 6.1.2, 6.1.3, 6.1.4, 6.2, 6.3, 6.3.1 to 6.3.4</p> <p><b>Chapter 7:</b> 7.2, 7.4</p>
<b>UNIT II</b>		
<p><b>Deadlocks:</b> Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.</p> <p><b>Memory Management:</b> Logical versus Physical Address Space, Swapping, Contiguous Allocation (Memory Allocation, Fragmentation), Paging (Basic Method), Segmentation (Basic Method).</p> <p><b>Virtual Memory:</b> Demand Paging, Page Replacement, Page Replacement Algorithms, Thrashing (concept).</p>	<b>Book 1</b>	<p><b>Chapter 8:</b> 8.2, 8.2.1, 8.2.2, 8.3, 8.4, 8.4.1 to 8.4.4, 8.5, 8.5.1 to 8.5.3 (8.5.3.1 and 8.5.3.3), 8.6, 8.6.1 – 8.6.2, 8.7, 8.7.1, 8.7.2.</p> <p><b>Chapter 9:</b> 9.1.2, 9.2, 9.3, 9.3.2, 9.3.3, 9.4, 9.4.1, 9.5, 9.5.1.</p> <p><b>Chapter 10:</b> 10.1, 10.2, 10.2.1, 10.4.1 to 10.4.4, 10.6.</p>
<b>UNIT III</b>		
<p><b>An Introduction to Linux:</b> Free and Open Source Software, Origin of Linux, Linux Kernel, Linux Features, Introduction About Linux Distributions, RPM Based Distributions, Deb Based Distributions.</p> <p><b>Managing Linux Files and Folders:</b> Introduction, Linux Files and Folders, Creating Files and Folders, Managing Files and Folders, Searching for Files, Linux File System, Linux File Managers.</p> <p><b>Linux Administration Basics.</b></p>	<b>Book 2</b>	<p><b>Chapter 1:</b> Pages 1-14.</p> <p><b>Chapter 2:</b> Pages 17-19 (exclude Using Linux Distribution).</p> <p><b>Chapter 5:</b> Pages 79-96.</p> <p><b>Chapter 6:</b> Pages 97-118</p>
<b>UNIT IV</b>		
<p><b>Linux Commands:</b> Command format, Directory oriented command, wild card characters, File oriented commands, File Access Permissions, Process oriented commands, Background processing, Communication oriented commands, General purpose commands.</p>	<b>Book 3</b>	<p><b>Chapter 2:</b> Page 8-33, Page 36-37 (Exclude du and df, ln, comm, touch, expand, nl, tac, tail, head, nohup, at, batch),</p>

<p>Pipe and Filters related commands.</p> <p>vi Editor, Shell programming, System administration.</p>		<p><b>Chapter 3:</b> Page 39-52. (Exclude egrep, fgrep, uniq, pr, sed, gawk &amp; also exclude pages 56-65).  <b>Chapter 4:</b> Page 66-71.  <b>Chapter 5:</b> Page 72-76 &amp; Page 80-92. (Exclude command export &amp; exclude basename).  <b>Chapter 7:</b> Page 119-123 (Exclude Managing Devices)</p>
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### Text Books

1. Abraham Silberschartz and Peter Galvin, **Operating System Concepts**, 6<sup>th</sup> Edition, TMH
2. K.L. James, **Linux: Learning the Essentials**, PHI learning Private Limited, 2011
3. B Mohammed Ibrahim, **Linux: A Practical Approach**, FireWall Media, 2009

### Reference Books

1. Andrew S Tanenbaum, **Operating System Design and Implementation**, PHI
2. Milan Milenkovic, **Operating Systems**, TMH
3. Cristopher Negus, Dreamtech, **Red Hat Linux 9 Bible**, Wiley Publication

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**III Semester – Detailed Syllabus\***

<b>Group I Course 8</b>	<b>BCAC 232 – Data Structures</b>	<b>I.A.: 20</b>
<b>Theory/Week: 4 Hours</b>		<b>Exam: 80</b>
<b>48 Hours</b>		<b>Credits: 2</b>

Topic	Chapter No.	Sections
<b>Unit I</b>		
<b>Introduction and Overview:</b> Data structures, data structure operations.	1	1.3, 1.4
<b>Introduction to Algorithms, Preliminaries:</b> Introduction, Algorithmic notations, Control structure.	2	2.3, 2.4
<b>Data Structure: Linear Data Structure - Arrays.</b> Introduction, Linear Arrays, Arrays as ADT, Representation of linear arrays in memory, traversing linear arrays (Algorithm 4.1), Inserting and deleting (Algorithm 4.2, 4.3) Representation of Polynomial using arrays (addition of polynomials excluded). Sparse matrices (Only Page no. 4.60)	4	4.1 to 4.6, 4.11, 4.17
<b>Unit II</b>		
<b>Sorting and Searching: Sorting</b> (Complexity of sorting algorithms, lower-bounds, sorting files: sorting pointers, sort order, sort stability are excluded) - Introduction, bubble sort, Insertion sort, Selection sort, Merge sort, Shell sort, Radix sort. (Balanced merge sort, K-way merge sort, Two-way merge sort, merging ordered and unordered files are excluded)	4 & 9	4.7, 9.1 to 9.8
<b>Searching</b> – Introduction, Linear search, Binary Search.	4	4.8, 4.9
<b>Linked List: Linked Lists:</b> Introduction, linked lists (excluding linked list as ADT), Representation of linked lists in memory, traversing a linked list (algorithm 5.1), Searching in a linked list - list is unsorted (algorithm 5.2) (excluding list is sorted). Memory allocation: Garbage collection, overflow and underflow, Insertion into a linked list, Insertion algorithm, inserting at the beginning of a list (algorithm 5.4), insert after a given node (algorithm 5.5) (exclude inserting into a sorted linked list). Deletion from a linked list, deletion algorithm, deleting the node following a given node (algorithm 5.8), Circularly linked list (exclude algorithms), Two-way list (doubly linked list), operations on two-way lists (excluding algorithms).	5	5.1 to 5.8, 5.10, 5.11
<b>Unit III</b>		
<b>Stack, Arithmetic Expression, Queues</b> <b>Stack</b> – Array representation of stacks, Linked representation of stacks, Operations, Applications of stacks - Recursion, Implementation of recursive procedure by stack (factorial function and Fibonacci sequence). <b>Arithmetic Expression:</b> Prefix, infix and postfix notation, infix to postfix conversion, evaluation of postfix expression. <b>Queues:</b> Array representation of queue, Linked representation of queue. Types of queue - Simple queue, circular queue (no	6	6.1 to 6.4,  6.6, 6.7, 6.8,  6.11, 6.12, 6.14, 6.15, 6.16

algorithms), double ended queue, priority queue (one-way list representation of priority queue, array representation of priority queue are excluded). Operations on queues.		
<b>Unit IV</b>		
<b>Trees:</b> Terminologies, tree properties, binary tree-properties, memory representation – array and Linked representation. <b>Binary Search Tree</b> – Creation through insertion, searching, Tree traversal (recursion algorithm). Applications of binary trees (representation of an expression using tree) <sup>#</sup> .	7	7.1 to 7.4 7.8, 7.9 <i># May refer Ref. Book 2</i>
<b>Graphs:</b> Terminologies, Matrix representation of graphs; Traversal: Breadth First Search and Depth first search.	8	8.3, 8.7

\* **Note: Time complexity of all algorithms is excluded.**

### **Text Books**

1. **Data Structures with C** by Seymour Lipschutz, Schaum's Outlines Series, Tata McGraw Hill, 2011
2. **Data Structures** by R. Venkatesan and S. Lovelyn Rose, First Edition: 2015, Wiley India Pvt. Ltd. Publications

### **Reference Books**

1. **Data Structures and Algorithm Analysis in C** by Mark Allen Weiss, 2<sup>nd</sup> Edition, Pearson Educations, 2013
2. **Data Structures Using C and C++**, Yedidyah Langsam, Moshe J. Augenstein and Aaron M. Tenenbaum, 2<sup>nd</sup> Edition, PHI Publication
3. **An Introduction to Data Structures with Applications**, 2<sup>nd</sup> Edition, by J.P. Tremblay and Sorenson, McGraw Hill 2000

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**III Semester – Detailed Syllabus**

<b>Group I Course 9</b>	<b>BCAC 233</b> <b>Visual Basic .NET Programming</b>	<b>I.A.: 20</b>
<b>Theory/Week: 4 Hours</b>		<b>Exam: 80</b>
<b>48 Hours</b>		<b>Credits: 2</b>

Topic	Chapter No.	Sections
<b>UNIT I</b>		
<p>Essential Visual Basic .NET, Working with Visual Basic .NET, New features, .NET framework and common language runtime, system name space, File extensions in VB.Net.</p> <p>The visual Basic integrated Development Environment: Start page, menu system, tool bars, New project dialog box, graphical designers, code designers, Intellisense, object browser, Toolbox, Solution explorer, property window, dynamic help window, component tray, server explorer, output window, task list, command window.</p> <p><b>The Visual Basic Language:</b> Visual basic statements-General syntax with keywords public, protected, friend, private, static, readonly. Option and import statements, Declaring constants and variables (with public, protected, friend, private, static, readonly.)</p> <p>Datatypes, datatype conversion, checking data types, declaring arrays and dynamic arrays, Redim and Preserve keywords, Handling Strings, string handling functions, conversion between strings to numbers and vice versa, characters and character codes.</p> <p>Operators, Operator precedence, commenting, Decision making: if...else, select case statements, Selections - switch and choose, Loop - Do, For, For Each...Next, While statements; With statement, Math methods, dates time properties, formatting date and time, End statement.</p>	<b>Book 1</b>	<p>1-2</p> <p>14-16</p> <p>23-47</p> <p>56-58</p> <p>60, 61</p> <p>65-66</p> <p>69-95</p>
<b>UNIT II</b>		
<p><b>Sub Procedures and Functions:</b> scope, exceptions, creating Sub procedures and Functions with private and public only, passing variable no. of arguments, using optional procedure arguments, preserving variable's values between Procedure calls with static variables, scope- block, procedure, module, name space, <b>Exception handling:</b> unstructured exception handling, using Resume Next and Resume Line, On Error Goto 0, getting an exception's number and description, raising an exception intentionally, structured exception handling, exception filtering in the Catch block, Multiple Catch statements, using Finally, throwing an Exception, throwing a Custom Exception.</p> <p><b>Windows Forms:</b> About Windows Forms, form designer.</p> <p><b>Form Properties</b> - Text, ControlBox, MaximizeBox and MinimizeBox, FormBorderStyle, controlling tab order, setting initial positions, BackColor, BackgroundImage, Enabled, Visible, ForeColor, Height, Icon, isMdiChild, IsMdiContainer, Location, MdiChildren, MdiParent, Name, Width, WindowState.</p>	<b>Book 1</b>	<p>98-101</p> <p>108-111</p> <p>113-115</p> <p>120-135</p> <p>138-140</p> <p>154-160</p> <p>162-163</p>

<p><b>Windows Forms Methods</b> – Activate, Close, Focus, Hide, LayoutMdi, Refresh, Show, ShowDialog.</p> <p><b>Events:</b> Activated, Click, Closed, Closing, DoubleClick, ForeColorChanged, GotFocus, Move, SizeChanged, TextChanged.</p> <p><b>MDI:</b> Creating MDI applications, creating MDI child windows in code, Arranging MDI child windows. MsgBox function, InputBox function, creating dialog box, Displaying reading from dialog box, creating Accept and Cancel button. Handling mouse events and handling keyboard events. Sending keystrokes to other programs.</p>		<p>168,171-175</p> <p>181-187</p> <p>Remaining specified topics from tables of properties, methods and events.</p>
<b>UNIT III</b>		
<p><b>Text Boxes, Rich Text Boxes, Labels and Link Labels:</b> Use of Text boxes, Rich Text Boxes, Labels and Link Labels, Creating Multiline, Word-wrap Text Boxes, Accessing Text, Adding Scroll Bars, Aligning text, Making a TextBox read-only, selecting and replacing Text in a TextBox, copying or getting selected text to or from the clipboard, creating a password control, controlling input in a TextBox, TextChanged event creating textbox in code.</p> <p>Accessing Text in a Rich TextBox, creating Bold, Italic, Underline and Strikeout Text, Indenting Text in Rich Text Boxes, Adding Bullets to Rich Text Boxes, Text color in RTF boxes, saving and loading RTF files from and to Rich Text Boxes, Aligning Text in RTB, creating RTB in Code.</p> <p>Using Labels instead of Text Boxes, Formatting, aligning Text in labels, Label events, using Labels to give access keys to controls without Captions, Use of Link Labels, Creating link labels, linking to another form.</p> <p>Use of Buttons, Checkboxes, Radio Buttons, Panels and Group boxes.</p> <p><b>Buttons:</b> Setting ForeColor and BackColor, Font, TabOrder, Picture, Click event.</p> <p><b>CheckBox:</b> Getting and setting CheckBox state, creating three-state checkboxes.</p> <p><b>RadioButton:</b> Getting and setting RadioButton state, Toggle Buttons. Adding controls to Panel and GroupBox in code. Use of List Boxes, Checked List Boxes, Combo Boxes and Picture Boxes.</p> <p><b>List Box:</b> Adding item, referring item by index, selected index changed, click, removing item, sorting, counting items, SelectedItem, SelectedIndex, multicolumn, multiselect listboxes, clearing a list box.</p> <p><b>Checked ListBox:</b> Determining the items checked, checking or unchecking items through code, handling item check events in checked list box. Types of comboboxes: simple, dropdown, dropdown list.</p> <p><b>PictureBox:</b> Setting or getting the image, adjusting box size, creating image maps.</p> <p>Use of Scroll Bars, Track Bars, Pickers, Tool Tips and Timers, Properties of scrollbars and trackbars: LargeChange, SmallChange, Maximum, Minimum, Value. Scroll event, Orientation, TickStyle, TickFrequency.</p> <p><b>DateTimePicker:</b> Maxdate, Mindate, CustomFormat, Text, Value. Setting DateTimePicker custom formats. Creating ToolTips. Timer properties, methods and events.</p> <p>Use of Image Lists, Tree and List Views, Toolbars, Status and</p>	<b>Book 1</b>	<p>196-199</p> <p>202-208</p> <p>212-225</p> <p>229-231</p> <p>234-236, 242</p> <p>250-251</p> <p>253-254</p> <p>256, 258, 259</p> <p>263-267</p> <p>270-278</p> <p>282-285</p> <p>287-288</p> <p>297-299</p> <p>303, 305, 309</p> <p>311-316</p> <p>326, 328-332</p> <p>338-340</p> <p>391-393, 396</p> <p>400-401, 407</p> <p>415-417</p> <p>421-424</p>

<p>Progress Bars.          Creating and using ImageList with other controls, Handling TreeView events, creating in code, creating, selecting, handling ListView, Creating toolbar with drop-down buttons, menu items, image button, combobox. Creating, adding panels, displaying text in status bar, creating progress bar.</p>		<p>427-428  431</p>
<b>UNIT IV</b>		
<p><b>Menus:</b> Creating menus, submenus, adding checkmark to items, menu access key, menu shortcuts, merging MDI menus, creating context menu, creating OpenFileDialog, SaveFile, Font, Color dialog boxes, printing, creating PrintPreview, PageSetup dialogboxes.  <b>Data Access with ADO.NET:</b> Databases, Basic SQL commands, Working with ADO.NET, Overview of ADO.NET objects, Accessing with server explorer, populating a dataset.  <b>Binding Controls to Databases:</b> Various ways to bind the data, simple binding, complex binding, binding data to control, Navigating data sets, Adding and deleting from a dataset, cancelling a dataset edit, updating the underlying datastore, Performing data validation in controls.  <b>Handling Database in Code:</b> Creating a table, data columns, data rows in code, accessing individual data items. Writing datasets to XML and reading datasets from XML.</p>	<b>Book 1</b>	<p>358-361          365-366          368, 371,           373, 375          377, 382          385, 387           822, 825-831,          853, 864-870          887-890           907          944-949, 950</p>

### Text Books

1. Steven Holzner, **Visual Basic .NET Programming Black Book**, Dreamtech Press

### Reference Books

1. Anita Millspaugh, Julia Case Bradley, **Programming in Visual Basic. NET**, Tata McGraw Hill
2. Dr Garima Khadelwal, **Programming with Visual Basic. NET**, Prakhar Publishers Distributors

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**III Semester – Practicals**

<b>Group I Practical V</b>	<b>BCAP 234</b> <b>Operating Systems</b> <b>and Data Structures Lab</b>	<b>I.A.: 20</b>
<b>Practical/Week: 4 Hours</b>		<b>Exam: 80</b>
<b>48 Hours</b>		<b>Credits: 2</b>

<b>Part A: Implementations using C++</b>	
1.	Write a program to demonstrate binary search.
2.	Write a program to demonstrate merge sort.
3.	Write a program to demonstrate insertion sort.
4.	Write a program to implement queue using arrays.
5.	Write a program to implement stack using arrays.
<b>Part B: Linux Shell Programs</b>	
1.	Write a menu driven shell script for the following. (a) Rename a file (check for the existence of the source file) (b) Display the current working directory (c) List the users logged in.
2.	Write a shell script to accept many filenames through command line. Do the following for each filename (a) If it is an ordinary file, display its content and also check whether it has execute permission. (b) If it is directory, display the number of files in it. (c) If the file/directory does not exist, display a message
3.	Write a menu driven shell script for the following. (a) Append the contents of a file to another file (Display the message if the file doesn't exist in the directory). (b) List all file names/ directory names in the present working directory which has the specified pattern (c) Assign execute permission to a specified file for the owner and group. [Note: create files/directories with different permissions for the first two options]
4.	Write a shell script to accept your option for deleting (-d) or for copying (-c) a file and filename(s) through command line arguments (Ex. For deletion: \$sh filename -d file1; for copying: \$sh filename -c file1 file2) and check for the following: (a) Check whether the given arguments are sufficient for the selected option. (b) File to be copied or deleted must be present in the directory. (c) While copying, if the destination file already exists, prompt for overwriting
5.	Write a shell script to accept many characters and count individual vowels, digits, spaces, special characters and consonants.

<b>Part C: Implementations using C++</b>	
1.	Write a Program for converting an Infix Expression to Postfix Expression. Program should support for both parenthesized and free parenthesized expressions with the operators: +, -, *, /, %( Remainder), ^ (Power) and alphanumeric operands.
2.	Write a program to implement circular queue using array.
3.	Write a program to implement stack using linked list.
4.	Write a menu driven program for the following operations on Binary Search Tree (BST) of Integers (a) Create a BST of N Integers (b) Traverse the BST in Inorder, Preorder and Post Order (c) Search the BST for a given element (KEY) and report the appropriate message
5.	Design, develop and implement a program for the following operations on Graph (G) of Cities (a) Create a Graph of N cities using Adjacency Matrix. (b) Print all the nodes reachable from a given starting node in a digraph using BFS method.

### Scheme of Examination

Sl. No.	Details			Marks	Total
1	Part-A	i	Problem solving and coding	8	<b>18</b>
		ii	Compiling the code and debugging	6	
		iii	Execution and result	4	
2	Part -B	i	Problem solving and coding	10	<b>22</b>
		ii	Compiling the code and debugging	7	
		iii	Execution and result	5	
3	Part -C	i	Problem solving and coding	11	<b>25</b>
		ii	Compiling the code and debugging	8	
		iii	Execution and result	6	
4	Class Records				<b>10</b>
5	Viva -Voce				<b>5</b>
<b>Total Marks</b>					<b>80</b>

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<b>Group I Practical VI</b>	<b>BCAP 235</b> <b>Visual Basic.NET Lab</b>	<b>I.A.: 20</b>
<b>Practical/Week: 4 Hours</b>		<b>Exam: 80</b>
<b>48 Hours</b>		<b>Credits: 2</b>

**PART A**

- Write a program to find the Sum of digit and check palindrome or not. Accept input through textbox and display the results in label. Also validate for invalid input such as empty input, nonnumeric and negative integer.

**(Marks distribution: Interface 4, Validations 3, logic Coding 5, Output 3)**

- Create 3 forms Yourself.vb, Yourplace.vb and College.vb where each includes a rich textbox containing the respective information. Create an MDI form with menu options to open all these forms as child forms, closing them and rearrange the child forms as follows.

**Child Forms**

Open

Close

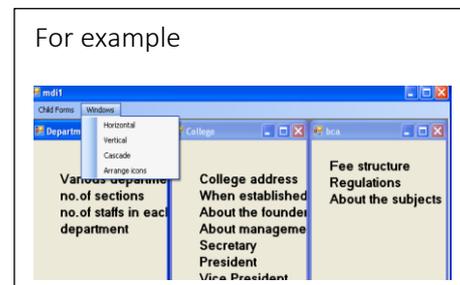
**Window**

Cascade

Tile Horizontal

Tile vertical

Arrange icons.



**(Marks distribution: Interface 3, creating 3 child forms 3, Coding 6, Output 3)**

- Design a form to accept number of books to be ordered to a shop in a textbox. By clicking a button 'Continue', if accepted number is > 0, then place required number of textboxes on the form to accept the details Title, Author and Copies, during run time to accept details of specified number of books. By clicking a button 'Next' on this form, enabling progression bar, send the details to another form to show the summary of the books ordered.

For example

**SWAPNA BOOK HOUSE**

Enter no. of books to be ordered

**Enter Title, Author and Copies below**

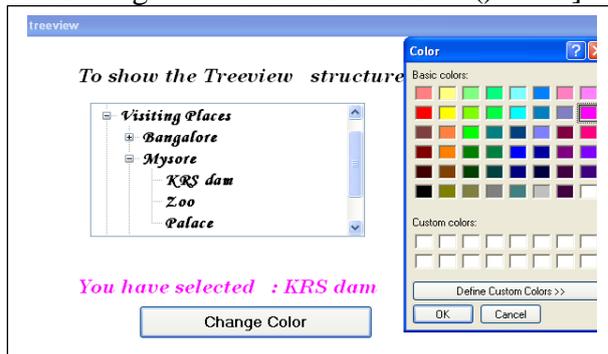
TITLE	AUTHOR	COPIES
<input type="text" value="C Programming"/>	<input type="text" value="E. Balagurusamy"/>	<input type="text" value="10"/>
<input type="text" value="Java"/>	<input type="text" value="E. Balagurusamy"/>	<input type="text" value="2"/>
<input type="text" value="HTML Blackbook"/>	<input type="text" value="Steven Holzner"/>	<input type="text" value="2"/>

**book2**

Your Order for 3 books received  
C Programming-E. Balagurusamy-10 copies  
Java-E. Balagurusamy-2 copies  
HTML Blackbook-Steven Holzner-2 copies

**(Marks distribution: Interfaces 4, Coding 8, Output 3)**

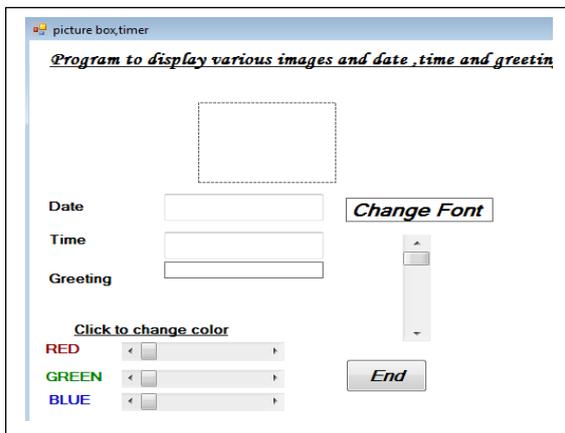
4. Create a tree structure using TreeView control with at least 3 nodes with 2 sublevel nodes under each node. When any node is clicked display the text in a label and when the mouse pointer moves to this label change the font color by applying the color selected in default color dialog box. [Use ColorDialog control and MouseMove() event]



(Marks distribution: Interfaces 4, Coding 8, Output 3)

## PART B

5. Design a VB interface containing
- A picture box whose picture should be changed every 5 second (use 5 pictures).
  - Textboxes to display date & time and day greeting based on time. Time has to be changed every second automatically.
  - Use scrollbars to change font size and background color (RGB) of the textbox that shows greeting.
- [Use timer, scrollbars]



(Marks distribution: Interfaces and setting properties 6, Coding 10, Output 4)

6. Design a VB interface to add, remove, search and clear the items in a combo box. The item name to be added, removed or searched can be accepted through input box. Use a general procedure to find the existence of item before deleting or while searching.

(Marks distribution: Interfaces 3, Procedure 4, Adding 3, searching 2, removing 3, clear 1, Output 4)

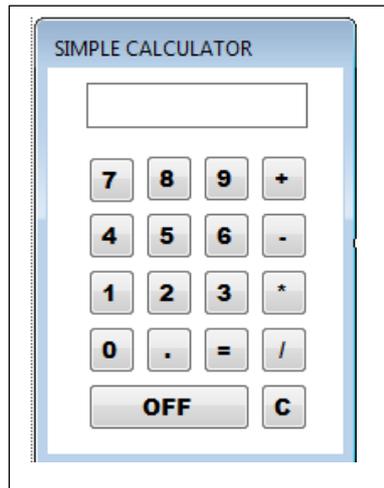
7. Design a simple calculator to perform addition, multiplication, subtraction and division. It should contain buttons for digits 0-9, clear, dot, =, +, -, \*, /.

Apply the validation rules to avoid entering dot more than once in a number and using – symbol between the digits.

Symbol ‘-’ can be used as operator as well as for negative numbers.

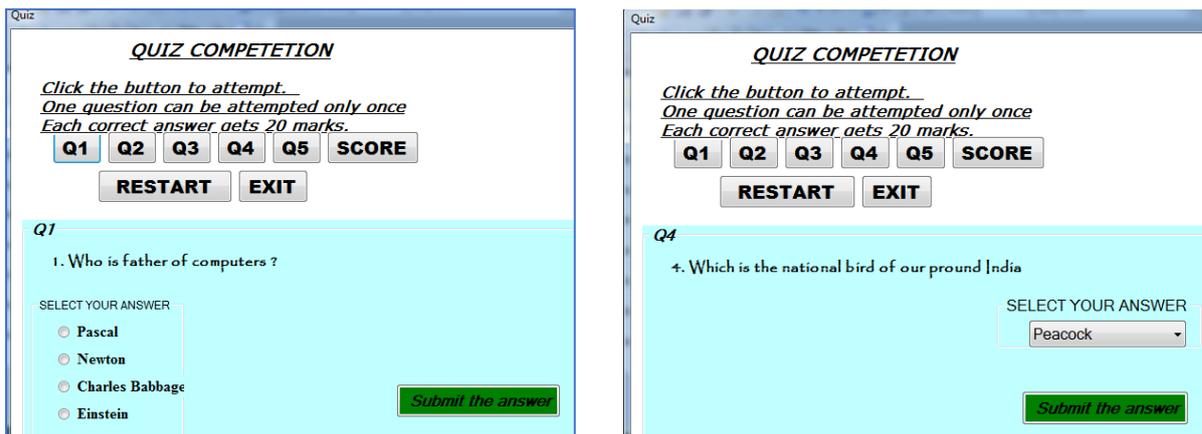
Any operand can be negative.

“Division by zero” to be displayed if divisor is 0.



(Marks distribution: Interfaces 6, coding 9, Output 5)

8. Design VB interface to conduct simple multiple choice Quiz with at least 5 questions. For selecting the answers, use combo box and radio buttons for few questions. One question can be answered only once. Show the total score through the message box whenever the user wishes to see his score in between the competition. Any question can be attempted randomly. Design can be as shown below.



(Marks distribution: Interface 7, coding 9, Output 4)

### PART C

9. Create an application program for a post with the ability to take input from a Candidate name, father's name, date of birth (by using date picker) Gender (option buttons), qualification (Using list box), address (Using Multiple text box), hobbies (4 check boxes for specified hobbies and a textbox for other).

Use proper validation for

- Name of the person can include only alphabets and space (Key\_Press).
- Age must be at least 18
- All data are mandatory

Store the valid information in a table and use DataGrid to view the inserted records.

**(Marks distribution: Table creation 2, Interface 5, validation code 5, Code for inserting, displaying, etc. 8, Output 5)**

10. Create a table TELEPHONE containing Telephone no, name and address of a customer as the fields. Set up a VB interface with command buttons to add, edit, delete, save.

Apply validation rule

- i) Telephone number to check for only +ve numeral.
- ii) All the data are mandatory.
- iii) Record should not be duplicated.
- iv) When editing, Telephone number should be locked so that only name and address can be edited.
- v) While editing or deleting, if the accepted Telephone no is not exist give proper message.

**(Marks distribution: Table creation 2, Interface 4, validation code 5, Code for inserting, editing, removing, displaying, etc. 9, Output 5)**

11. Create a table EMP with Empcode, Name, Basic pay, DA, HRA, PF, Gross, Tax and Netpay. Set up a data entry form to input Empcode, name and salary. Other allowances should be calculated and to be shown on the form which cannot be modifiable. Use the command button for adding, saving, computing and various navigation (first, next, previous, last). While adding, new record Empcode should be incremented automatically by 1 from last record.

- i) All data are necessary while saving.
- ii) Basic pay should be +ve integer.
- iii) While navigating, if the control goes beyond beginning or end of the file, display error message.
- iv) DA is 40% of Basic pay if Basic pay > 20000, otherwise 30% of Basic pay.
- v) HRA is 10% of Basic pay.
- vi) PF is minimum of 12% of Gross or Rs.780.
- vii) Professional Tax is 10% of Gross.
- viii)  $\text{Net pay} = \text{Gross} - (\text{PF} + \text{PT})$

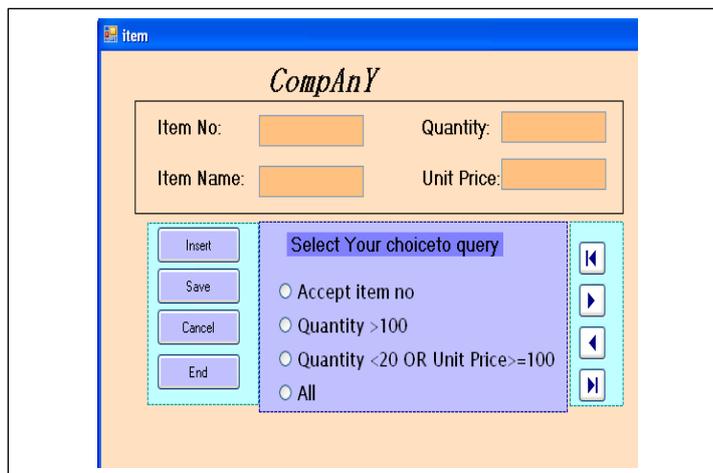
(Marks distribution: Table creation 2, Interface 4, validation code 5, Code for inserting, displaying, etc. 10, Output 4)

12. Create a table item contains Item no, name, quantity in stock and unit price. Design a VB interface to enter he records and save to the table. Apply the validation rule for quantity and price for +ve numbers and non-zero. Use the command buttons to navigate (first, next, prev, last) through the records depending on search criteria.

Searching can be

- i) By accepting item no.
- ii) Only the items with quantities > 100
- iii) Items either quantity less than 20 or unit price >= 100
- iv) To view all.

While viewing it, should not be editable.



(Marks distribution: Table creation 2, Interface 5, validation code 3, Code for inserting, displaying, etc. 10, Output 5)

### Scheme of Examination

Sl. No.	Details		Marks	Total	
1	Part -A	i	Program	8	<b>15</b>
		ii	Execution and result	7	
2	Part -B	i	Problem solving and coding	12	<b>20</b>
		Ii	Execution and result	8	
3	Part -C	i	Problem solving and coding	18	<b>25</b>
		ii	Execution and result	7	
4	Class Records				<b>10</b>
5	Viva -Voce				<b>10</b>
<b>Total Marks</b>					<b>80</b>