UNIT 6

7 Hours

Virtual functions, Polymorphism: Virtual function, Calling a Virtual function through a base class reference, Virtual attribute is inherited, Virtual functions are hierarchical, Pure virtual functions, Abstract classes, Using virtual functions, Early and late binding.

UNIT 7

6 Hours

I/O System Basics, File I/O: C++ stream classes, Formatted I/O, I/O manipulators, fstream and the File classes, File operations

UNIT 8

7 Hours

Exception Handling, STL: Exception handling fundamentals, Exception handling options
STL: An overview, containers, vectors, lists, maps.

Text Books:

1. Herbert Schildt: The Complete Reference C++, 4th Edition, Tata McGraw Hill, 2003.

Reference Books:

1. Stanley B.Lippmann, Josee Lajore: C++ Primer, 4th Edition, Pearson Education, 2005.
2. Paul J Deitel, Harvey M Deitel: C++ for Programmers, Pearson Education, 2009.
3. K R Venugopal, Rajkumar Buyya, T Ravi Shankar: Mastering C++, Tata McGraw Hill, 1999.

DATA STRUCTURES WITH C/C++ LABORATORY
(Common to CSE & ISE)

Subject Code: 10CSL37   I.A. Marks : 25
Hours/Week : 03   Exam Hours: 03
Total Hours : 42   Exam Marks: 50

1. Using circular representation for a polynomial, design, develop, and execute a program in C to accept two polynomials, add them, and then print the resulting polynomial.

2. Design, develop, and execute a program in C to convert a given valid parenthesized infix arithmetic expression to postfix expression and then to print both the expressions. The expression consists of

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single character operands and the binary operators + (plus), - (minus), * (multiply) and / (divide).

3. Design, develop, and execute a program in C to evaluate a valid postfix expression using stack. Assume that the postfix expression is read as a single line consisting of non-negative single digit operands and binary arithmetic operators. The arithmetic operators are + (add), - (subtract), * (multiply) and / (divide).

4. Design, develop, and execute a program in C to simulate the working of a queue of integers using an array. Provide the following operations:
   a. Insert   b. Delete   c. Display

5. Design, develop, and execute a program in C++ based on the following requirements:
   An EMPLOYEE class is to contain the following data members and member functions:
   Data members: Employee_Number (an integer), Employee_Name (a string of characters), Basic_Salary (an integer), All_Allowances (an integer), IT (an integer), Net_Salary (an integer).
   Member functions: to read the data of an employee, to calculate Net_Salary and to print the values of all the data members.
   (All_Allowances = 123% of Basic; Income Tax (IT) = 30% of the gross salary (= basic_Salary _ All_Allowance); Net_Salary = Basic_Salary + All_Allowances – IT)

6. Design, develop, and execute a program in C++ to create a class called STRING and implement the following operations. Display the results after every operation by overloading the operator <<.
   i.   STRING s1 = "VTU"
   ii. STRING s2 = "BELGAUM"
   iii. STIRNG s3 = s1 + s2; (Use copy constructor)

7. Design, develop, and execute a program in C++ to create a class called STACK using an array of integers and to implement the following operations by overloading the operators + and - :
   i.   s1=s1 + element; where s1 is an object of the class STACK and element is an integer to be pushed on to top of the stack.
   ii. s1=s1- ; where s1 is an object of the class STACK and – operator pops off the top element.

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Handle the STACK Empty and STACK Full conditions. Also display the contents of the stack after each operation, by overloading the operator <<.

8. Design, develop, and execute a program in C++ to create a class called LIST (linked list) with member functions to insert an element at the front of the list as well as to delete an element from the front of the list. Demonstrate all the functions after creating a list object.

9. Design, develop, and execute a program in C to read a sparse matrix of integer values and to search the sparse matrix for an element specified by the user. Print the result of the search appropriately. Use the triple <row, column, value> to represent an element in the sparse matrix.

10. Design, develop, and execute a program in C to create a max heap of integers by accepting one element at a time and by inserting it immediately in to the heap. Use the array representation for the heap. Display the array at the end of insertion phase.

11. Design, develop, and execute a program in C to implement a doubly linked list where each node consists of integers. The program should support the following operations:
    i.   Create a doubly linked list by adding each node at the front.
    ii. Insert a new node to the left of the node whose key value is read as an input.
    iii. Delete the node of a given data if it is found, otherwise display appropriate message.
    iv. Display the contents of the list.
    (Note: Only either (a,b and d) or (a, c and d) may be asked in the examination)

12. Design, develop, and execute a program in C++ to create a class called DATE with methods to accept two valid dates in the form dd/mm/yy and to implement the following operations by overloading the operators + and -. After every operation the results are to be displayed by overloading the operator <<.
    i.   no_of_days = d1 – d2; where d1 and d2 are DATE objects, d1 >=d2 and no_of_days is an integer.
    ii. d2 = d1 + no_of_days; where d1 is a DATE object and no_of_days is an integer.

13. Design, develop, and execute a program in C++ to create a class called OCTAL, which has the characteristics of an octal number.

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Implement the following operations by writing an appropriate constructor and an overloaded operator +.
  i.   OCTAL h = x ; where x is an integer
  ii. int y = h + k ; where h is an OCTAL object and k is an integer.
Display the OCTAL result by overloading the operator <<. Also display the values of h and y.

14. Design, develop, and execute a program in C++ to create a class called   BIN_TREE that represents a Binary Tree, with member functions to perform inorder, preorder and postorder traversals. Create a BIN_TREE object and demonstrate the traversals.

Note: In the examination each student picks one question from a lot of *all* the 14 questions.

ELECTRONIC CIRCUITS & LOGIC DESIGN LABORATORY
(Common to CSE & ISE)

Subject Code: 10CSL38	I.A. Marks : 25
Hours/Week : 03	Exam Hours: 03
Total Hours : 42	Exam Marks : 50

PART-A

1. a) Design and construct a suitable circuit and demonstrate the working of positive clipper, double-ended clipper and positive clamper using diodes.
   b) Demonstrate the working of the above circuits using a simulation package.

2. a) Design and construct a suitable circuit and determine the frequency response, input impedance, output impedance, and bandwidth of a CE amplifier.
   b) Design and build the CE amplifier circuit using a simulation package and determine the voltage gain for two different values of supply voltage and for two different values of emitter resistance.

3. a) Design and construct a suitable circuit and determine the drain characteristics and transconductance characteristics of an enhancement-mode MOSFET.
   b) Design and build CMOS inverter using a simulation package and verify its truth table.

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