Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : X60440

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Third Semester
Electronics and Communication Engineering
EC 2202/EC 33/080290009/10144 EC 303 – DATA STRUCTURES AND OBJECT
ORIENTED PROGRAMMING IN C++
(Regulations 2008/2010)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   **(10×2=20 Marks)**

1. Present the hierarchy of C++ data types.

2. What is operator overloading ? Enlist the operators that can not be overloaded.

3. List out various forms of inheritance.

4. Write syntax for rethrowing an exception.

5. What are the limitations of linear queues ? How are they overcome using circular queues ?

6. What is meant by underflow and overflow condition in a stack ?

7. What is binary tree ? Give example.

8. In an AVL tree, at what condition the balancing is to be done ?

9. List the four types of sorting techniques.

10. How data is sorted in a Queue structure ?

PART – B   **(5×16=80 Marks)**

11. a) i) Explain the control structures available in C++ with suitable examples.   **(8)**

    ii) Explain the structure of C++ program with an example.   **(8)**

              (OR)

   b) i) Define constructor. Write different types of constructors in detail.   **(8)**

    ii) Write a C++ program to swap two numbers using friend function.   **(8)**

12. a) i) Derive inheritance for insurance policies. **(8)**

    ii) Give the structure form of scope rules for public, private and protected access to superclass and subclass members and objects. **(8)**

        (OR)

  b) i) Explain polymorphism with an example. **(8)**

    ii) List and brief different string handling techniques. **(8)**

13. a) Write the pseudo code for the following :

    i) Split a stack into two. The first contains the bottom half elements and the second contains the remaining elements. **(8)**

    ii) Combine two stacks by placing all elements of the second stack on top of those in the first stack. **(8)**

        (OR)

  b) Write an algorithm to perform each of the following operations :

    i) Reverse a list, so that the last element comes first and so on. **(5)**

    ii) Return the sum of integers in a list. **(6)**

    iii) Delete every third element from a list. **(5)**

14. a) Explain the process of inserting and deleting an element in the AVL tree with an example.

        (OR)

  b) What is a minimum spanning tree ? Explain with an example an algorithm for constructing a minimum spanning tree.

15. a) i) Compare bubble-sort with insertion-sort with an example. **(8)**

    ii) Explain how divide and conquer technique can be applied for merge sort. **(8)**

        (OR)

  b) Find the expected number of passes, comparisons and exchanges for shell sort when the number of elements is equal to 10. Compare this result with the actual number of operations when the given sequence is as follows :

7, 1, 3, 4, 10, 9, 8, 6, 5, 2 **(16)**

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