Question Paper Code : 51443

B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

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. Define constructor.

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

3. Define pure virtual function and mention its usage.

4. Write the benefits of using the template functions in C++.

5. Convert the given notation from infix to postfix.

6. Define hashing.

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) Create an base class named, 'shape' with two members base and height, a member function for initialization and a virtual function to compute area ( ). Derive two specific classes Triangle and Rectangle which override the function area ( ). Use these classes in the main function and display the area of a triangle and a rectangle using virtual functions. **(8)**

      (ii) Define inheritance. Mention its types. Write a C++ program to illustrate the concept of multiple inheritance. **(8)**

OR

   (b) (i) Write a program to do the following string handling functions in C++.

        (1) Concatenate two strings.

        (2) Search a substring in a string. **(8)**

      (ii) Define exception handling. Mention the keywords used to implement the exception handling concept. Also illustrate the working of the exception handling mechanism with an example. **(8)**

13. (a) Explain the process of inserting and deleting an element in a circular queue with an example. **(16)**

OR

   (b) Explain with an example the formation of heap data structure and the properties to be found in a heap. **(16)**

14. (a) Explain the binary tree traversal with syntax. **(16)**

OR

   (b) Find the shortest path for a graph with any algorithm. **(16)**

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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