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Question Paper Code : 31352

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Third Semester

Electronics and Communication Engineering

EC 2202/EC 33/10144 EC 303/080290009 — DATA STRUCTURES AND OBJECT ORIENTED PROGRAMMING IN C++

(Regulation 2008/2010)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What is data encapsulation? Give example.

2.   When do we declare member of a class static?

3.   What is the need to declare base classes as virtual?

4.   What is the use of virtual functions in C++?

5.   What is a priority queue?

6.   Define recursion and specify the data structures used to perform recursion.

7.   What is binary tree? Give example.

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

9.   Does the minimum spanning tree of a graph give the shortest distance between any 2 specified nodes?

10. State why quick sort is more efficient than merge sort.

PART B — (5 × 16 = 80 marks)

11. (a) Explain with examples the types constructors in C++.

Or

(b) Write a C++ program that contains a class String and overloads the following operators on Strings.

+ to concatenate two strings

− to delete a substring from the given string

= = to check for the equivalence of both strings.

12. (a) (i) What is inheritance? Explain with examples the different types of inheritance in C++. (12)

(ii) What are the different modes in which you can open a file in C++? (4)

Or

(b) (i) Explain how to overload template function with an example. (8)

(ii) Explain how to handle multiple exceptions in C++ with an example. (8)

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

Or

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

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) Sort the following values using Quick Sort and estimate its time and space complexity:

65 70 75 80 85 60 55 50 45

Illustrate each step of the sorting process.

Or

(b) Explain any two application areas that use dynamic programming concept with an example.

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