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Question Paper Code : 21443

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

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. How to create symbolic constants in C++?

2. Define destructors with syntax.

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

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

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. Why is always a red node inserted into a red-black-tree?

8. Does the minimum spanning tree of a graph give the shortest distance between any two specific nodes? Justify your answer.

9. Sort the numbers 34, 12, 25, 14 using merge sorting technique.

10. What is meant by dynamic programming?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the following:
(i) Comparison of conventional programming and OOPS (6)
(ii) Operator overloading. (6)
(iii) Constructors and destructors. (4)

Or

(b) (i) Explain the control structures of C++ with suitable examples. (12)
(ii) Define function over-loading with a simple example. (4)

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) (i) Explain why algorithm having exponential time complexity are not preferred. (8)
(ii) With a simple program, explain various operations of linked list. (8)

Or

(b) (i) Consider the array Heap = [3, 5, 6, 7, 20, 8, 12, 9, 15, 17, 30]. Consider an empty heap. Construct a MAX HEAP while inserting these values one of one. Display the heap after each insertion. (10)
(ii) Discuss the stack and its operations. (6)

14. (a) Explain the process of inserting and deleting an element in the AVL tree with an example. (16)

Or

(b) What is a minimum spanning tree? Explain any one algorithm for constructing a minimum spanning tree with an example (16)

15. (a) (i) Illustrate inserting an element into a heap with the following numbers 10, 7, 21, 3, 5. (8)
(ii) Explain the stages of heap sort. (8)

Or

(b) Explain how divide and conquer is applied to merge sort. Trace the algorithm for the following set of data 25, 0, 8, 78, 6, 34, 56, 90, 100. (16)