(6 pages)

4548/SCS8C31/ SCS9C31 NOVEMBER 2013

DATA STRUCTURES AND C++ PROGRAMMING

(For those who joined in July 2008 and after)

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. _____ refers to putting together essential features without including background details.
   (a) Inheritance
   (b) Polymorphism
   (c) Function Overloading
   (d) Data Abstraction
2. Like a Constructor, the Destructor is a member function whose name is the same as the class name but is preceded by a _____
   (a) ! (b) ~
   (c) & (d) *
3. The mechanism of giving special meaning to an operator is known as _____
   (a) Operator Overloading
   (b) Function Overloading
   (c) Inheritance
   (d) Polymorphism
4. C++ supports a mechanism known as _____ to achieve run time polymorphism.
   (a) friend function
   (b) virtual function
   (c) inline function
   (d) inheritance
5. A/An _____ is an ordered set that consists of a fixed number of identical type of objects.
   (a) Index (b) Array
   (c) Function (d) File

6. The time Complexity of Linear Search Function is _____
   (a) O(N) (b) O(N log N)
   (c) O(log N) (d) $O(N^2)$
7. In a singly linked, every node contains _____ fields.
   (a) 2 (b) 3
   (c) 4 (d) 5
8. The infix expression for the postfix expression $ab-cd+*$ is
   (a) $(a+b)-(c*d)$ (b) $(a-b)*(c+d)$
   (c) $(a*b)-(c+d)$ (d) $(a+b)*(c-d)$
9. The _____ of a binary tree is the number of nodes on the longest path from the root to a leaf
   (a) Level (b) Height
   (c) Traversal (d) Degree

10. The strictly binary tree with n leaves always contains _____ nodes.
    (a) 2n (b) 2n-1
    (c) n-1 (d) 2^n-1

SECTION B — (5 × 7 = 35 marks)

Answer ALL questions.

Choosing either (a) or (b).

11. (a) Discuss about basic and derived data types in C++ with examples.

    Or

    (b) What are friend functions? Discuss them with example.

12. (a) Write a C++ Program to illustrate the use of Single Inheritance.

    Or

    (b) Discuss the usage of 'this' pointer with an example C++ Program.

13. (a) What are linear Arrays? Discuss about the Representation of Linear Arrays in Memory with examples.

Or

(b) Discuss briefly on Sparse Matrices.

14. (a) Discuss about Representation of Linked List in Memory and Traversing a Linked List.

Or

(b) Explain any one application of Stack with example.

15. (a) What are Binary Trees? Discuss about Types of Binary Trees.

Or

(b) Discuss in detail, Binary Tree Traversals.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Explain the basic concepts of Object Oriented Programming.

17. Write a C++ program to illustrate overloading unary operator.

18. Describe the various steps in Binary Search with examples.

19. Explain about Linked representation of Queues.

20. What are Binary Search Trees? Explain about Searching and Insertion in Binary Search Trees.

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