

14. (a) Discuss about searching a linked list with example.

Or

- (b) What is Recursion? Explain with an example.

15. (a) Discuss briefly on : Types of binary trees.

Or

- (b) Write short notes on : Binary tree traversals.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Write a C++ program to illustrate parameterized constructor.
17. Describe the rules for virtual functions.
18. What are records? Explain about representation of records in memory.
19. Write a C++ program to implement stack using array representation.
20. What are binary search trees? Explain searching and inserting in binary search trees with examples.

7534/SCS8C31/SCS9C31 APRIL 2013

DATA STRUCTURES AND C++ PROGRAMMING

(For those who joined in July 2008 and after)

Time : Three hours

Maximum : 75 marks

SECTION A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer :

1. _____ refers to the act of representing essential features without including the background details or explanations.
(a) Encapsulation (b) polymorphism
(c) Abstraction (d) Inheritance.
2. A/An _____ function is function that is expanded in line when it is invoked.
(a) Friend (b) Abstract
(c) Virtual (d) Inline.
3. The mechanism of deriving a class from another 'derived class' is known as _____ inheritance.
(a) Single (b) Multiple
(c) Multilevel (d) Hierarchical.

4. C++ uses a unique keyword called _____ to represent an object that invokes a member function.

- (a) This (b) Size of
(c) Super (d) Virtual.

5. _____ are data structures which hold multiple variables of the same data type.

- (a) Linked lists (b) Stacks
(c) Arrays (d) Queues.

6. _____ matrix contains many zero entries.

- (a) Adjacency (b) Diagonal
(c) Unit (d) Sparse.

7. _____ are implemented by each item having a link to the next item.

- (a) Linked lists (b) Sparse matrices
(c) Arrays (d) Graphs.

8. The postfix expression for the infix expression $(2*4 - 1*2)/(9-7)$ is

- (a) $24*12*-97/-$ (b) $24*12-97-/$
(c) $241-*12*97-/$ (d) $2497*-*-/12$.

9. Hierarchical structures represent _____ relation between data elements.

- (a) One-to-one (b) One-to-many
(c) Many-to-one (d) Many-to-many.

10. A binary tree of height h , has _____ elements in it.

- (a) 2^{h+1} (b) $2^{h-1}+1$
(c) 2^h-1 (d) $2^{h+1}-1$.

SECTION B — (5 × 7 = 35 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) List down the benefits of OOP.

Or

(b) Write a C++ program to illustrate function overloading.

12. (a) List the rules for operator overloading.

Or

(b) Write a C++ program to demonstrate the use of 'this' pointer.

13. (a) How to represent linear arrays in memory? Explain.

Or

(b) Discuss briefly on : linear search with example.