

DATA STRUCTURES AND C++ PROGRAMMING

(For those who joined in July 2008 and 2009)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL the questions.

1. The insulation of the data from direct access by the program is called

(a) Encapsulation (b) Polymorphism
(c) Data hiding (d) Overloading.

2. What will be the values of x , m and n after execution of the following statements?

```
int x, m, n;
```

```
m = 10;
```

```
n = 15;
```

```
x = ++m + n ++;
```

- (a) $x = 25, m = 10, n = 15$
(b) $x = 26, m = 11, n = 15$
(c) $x = 26, m = 11, n = 16$
(d) Error, cannot be executed.

3. Which one of the following operator can be overloaded?

(a) $::$ (b) $?:$
(c) size of (d) $<<$.

4. The following examples show that the class C is derived from classes A and B. Which of the statement is correct?

(a) Class C : public A, public B
(b) Class C : public A : public B
(c) Class C : public A, B
(d) Class C :: public A, public B.

5. _____ is a collection of related data items

(a) Array (b) Record
(c) Stack (d) Tree.

6. In binary search, algorithm determines that the search element ITEM is in the right half of the array which of the following statements will set the appropriate variable to the appropriate value

(a) $BEG = MID + 1$ (b) $END = MID - 1$
(c) $BEG = MID - 1$ (d) $END = MID + 1$.

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7. _____ is a linear list in which elements can be added at the both the end and not in the middle

(a) Stack (b) Queue
(c) Dequeue (d) Binary tree.

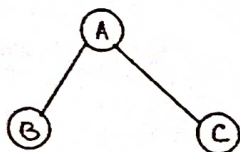
8. Which of the following is an output postfix notation of $a - (b/c)$?

(a) $abc/-$ (b) $abc-/$
(c) $ab-c/$ (d) $ab/c-.$

9. A terminal node is called a

(a) branch (b) root
(c) leaf (d) path.

10. Consider the binary tree



which one of the following is the order of the nodes if it is traversed by in order?

(a) ABC (b) BAC
(c) BCA (d) CAB.

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PART B — (5 × 7 = 35 marks)

Answer ALL the questions.

11. (a) Explain inline function with suitable example.

Or

- (b) How is a member function defined in a class?

12. (a) What is polymorphism? What is this pointer?

Or

- (b) Write a C++ program to overload + operator to add two complex numbers.

13. (a) Explain linear search with suitable example.

Or

- (b) Explain the traversal operation on linear array.

14. (a) Explain how to insert an element into a linked list.

Or

- (b) Explain the postfix and prefix expressions for the following infix expressions

 $a * b + c * d + e / f.$

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15. (a) Explain how to represent a binary tree in memory.

Or

- (b) Explain binary tree traversal with suitable example.

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Define a class to represent a bank account. Include the following members.

Data member :

- (a) Name of the depositor.
- (b) Account number.
- (c) Type of account.
- (d) Balance amount in the account.

Member function :

- (a) To assign initial value.
- (b) To deposit an amount.
- (c) To withdraw an amount after checking the balance.

Write a C++ main program.

17. Explain multiple and multilevel inheritance with suitable example.

18. Explain bubble sort method with suitable example.

19. Explain how to insert and delete an element into a queue.

20. Explain search algorithm in binary search tree.
