C 62593 (Pages : 3) Name.....

Reg. No.....

# SECOND SEMESTER B.A./B.Sc. DEGREE EXAMINATION, MAY 2019

(CUCBCSS—UG)

Computer Science

BCS 2B 02—OOP CONCEPTS AND DATA STRUCTURES USING C++

(2014 Admissions)

Time : Three Hours Maximum : 80 Marks

## Part A

*Answer* **all** *the questions.*
*Each question carries* 1 *mark.*

1. In C++, the concept of ———— provides a facility to assign values to function parameters when the function is declared.
2. If A represents a class, then the phrase A::* means ————.
3. ———— is a special member function which enables an object to initialize itself when it is created.
4. If all the member functions of one class act as friend functions of another class, then the former class is called ————.
5. The keyword *this* refers to the pointer to the current object within a member function (True/False).
6. Which condition is to be tested before inserting an element into a stack ?
7. The prefix form of the expression (A × B – C) is ————.
8. The OS of a computer may periodically collect all the free memory space to form contiguous block of free space. This is called ————.
9. In which data structure where elements can be added or removed at either end but not in the middle ?
10. In column major order representation of a two dimensional array A, the address of $(i, j)^{th}$ element is calculated as ————.

(10 × 1 = 10 marks)

Turn over

## Part B

*Answer* **all** *the questions.*
*Each question carries* 2 *marks.*

11. What is a friend function ?
12. What is operator overloading ?
13. What is the use of constructor ?
14. What is a sparse matrix ?
15. List and describe the operations to be performed on a queue.

(5 × 2 = 10 marks)

## Part C

*Answer any* **five** *questions.*
*Each question carries* 4 *marks.*

16. What are the advantages of using an inline function ?
17. Compare private, public and protected data.
18. Write a C++ program to add two complex numbers.
19. Write a C++ program to read a list of names from a file and output the list.
20. Write different steps to insert a node at the beginning of a singly linked list.
21. Describe how the limitations of a queue are handled in a circular queue ?
22. Explain how PUSH and POP operations are performed on a STACK ?
23. Write an algorithm to implement merge sort.

(5 × 4 = 20 marks)

## Part D

*Answer any* **five** *questions.*
*Each question carries* 8 *marks.*

24. Explain the merits of an OOP language compared to conventional programming languages.
25. Explain different types of type conversion.
26. What do you mean by a friend function ? Explain with help of an example program, how friend functions act as a bridge between two different classes.

27. Write short notes on :

    (a) Significance of virtual base classes.

    (b) Static member functions.

28. Write an algorithm to evaluate a post-fix expression using stack and explain with an example.

29. (a) Explain how insertion and deletion takes place in a circular queue ?

    (b) What is hashing ? Explain different methods used to perform hashing ?

30. Write a C++ program to delete the last node of a doubly linked list.

31. Write short notes on :

    (a) Applications of queues.

    (b) Binary search algorithm.

(5 × 8 = 40 marks)