

**THIRD SEMESTER B.C.A. DEGREE EXAMINATION, NOVEMBER 2017**

(CUCBCSS—UG)

Core Course

BCA 3B 04—DATA STRUCTURES USING C++

Time : Three Hours

Maximum : 80 Marks

**Part A***Answer all questions.**Each question carries 1 mark.*

1. The total number of nodes in the binary tree which has of level three is :  
(a) 8. (b) 7.  
(c) 9. (d) 6.
2. Name of data structure which can store finite number of homogeneous elements :  
(a) Struct. (b) Class.  
(c) Union. (d) Array.
3. Which is the postfix notation of  $((A/B-C)+(D*E))-(A*C)$  :  
(a)  $AB/C-DE*+AC*-$  (b)  $AB/C-DE*+AC-*$   
(c)  $ABC/-DE*+AC*-$  (d)  $AB/CDE*-+AC*-$
4. Class is a \_\_\_\_\_ data type.  
(a) Abstract. (b) Built-in.  
(c) Enumerated. (d) Stand alone.
5. Symbol used for destructor is \_\_\_\_\_.  
(a) +. (b) -.  
(c) ~. (d) &.
6. Calculation of hash function in division method is :  
(a)  $h(\text{key}) = \text{key} \% \text{tablesize}$ . (b)  $h(\text{key}) = ((r+s*\text{key})\%x)/d$ .  
(c)  $h(\text{key}) = (c/(d*\text{key}+e))\% \text{tablesize}$ . (d)  $h(\text{key}) = (cl/(dl*\text{key}+el))\%nl$ .

**Turn over**

7. Name of a data structure in which elements are inserted and deleted in different ends are called.
- (a) Queue. (b) Stack.  
(c) Linked list. (d) Tree.
8. Which of the following is false about a doubly linked list ?
- (a) We can navigate in both the directions.  
(b) It requires more space than a singly linked list.  
(c) The insertion and deletion of a node take a bit longer.  
(d) None of the above.
9. When do you use a sparse array ?
- (a) When there are unique elements in the array.  
(b) When the array has more occurrence of zero elements.  
(c) When the data type of elements differ.  
(d) In all of the mentioned cases.
10. Which one is not a characteristic of an algorithm ?
- (a) Precision. (b) Uniqueness .  
(c) Infiniteness. (d) Input.

(10 × 1 = 10 marks)

### Part B

*Answer all questions.*

*Each question carries 2 marks.*

11. What is the advantage of sparse matrix over simple matrix.
12. What is a circular queue?
13. What are the terminologies of one dimensional array.
14. What is hashing ?
15. Represent a stack with 10 elements.

(5 × 2 = 10 marks)

**Part C**

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

16. Define graph ? What are the applications of graph.
17. What are the different characteristics of C++ ?
18. Discuss about the implementation of priority queue.
19. Define sparse matrix ? Explain about how it can be represented.
20. Discuss about the queue operations ?
21. Differentiate single linked list and circular linked list.
22. Write a program to find factorial of a number using recursion.
23. Write the application of binary tree.

(5 × 4 = 20 marks)

**Part D**

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

24. What are the different binary tree searching techniques.
25. Write any the sorting algorithms with example.
26. Write algorithms related to stack operations.
27. Write binary search algorithm.
28. Explain sparse matrix representation and manipulation in detail.
29. Write an algorithm to implement quick sort. Explain it with an example
30. Discuss about doubly linked list.
31. What is hash function ? What are different methods of choosing a hash function ?

(5 × 8 = 40 marks)