Reg. No. : | | | | | | | | | | |

Question Paper Code: 43223

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Third Semester

Electronics and Communication Engineering

14UCS323 - DATA STRUCTURES AND ALGORITHM ANALYSIS

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Format flags may be combined using

   (a) The bitwise OR (|) (b) The logical OR (||)
   (c) The bitwise AND (&) (d) The logical AND (&&)

2. The default access specifier for the classes is

   (a) Private (b) Public (c) Protected (d) Static

3. If you design a class that needs special initialization tasks, you want to design a(n) _____

   (a) Housekeeping routine (b) Initializer
   (c) Constructor (d) Compiler

4. Function templates can accept

   (a) Any type of parameters (b) Only one parameter
   (c) Only parameters of the basic type (d) Only parameters of the derived type

5. A heap is a _____.

   (a) Binary tree (b) Full binary tree
   (c) Complete binary tree (d) Binary search tree

6. A mathematical-model with a collection of operations defined on that model is called

(a) Data Structure (b) Algorithm
(c) Primitive Data Type (d) Abstract Data Type

7. Which of the following is a balanced tree?

(a) Binary search tree (b) Binary tree
(c) AVL tree (d) Expression tree

8. The data structure required for Breadth First Traversal on a graph is

(a) queue (b) stack (c) array (d) tree

9. Which of the sorting technique is based on divide and conquer technique?

(a) Merge sort (b) Quick sort (c) All the above (d) None of the above

10. Which sorting technique is the successor of Bucket sort?

(a) Insertion sort (b) Bubble sort (c) Radix sort (d) Quick sort

PART - B (5 x 2 = 10 Marks)

11. What are the ways in which a constructor can be called?

12. List the IOs format function.

13. What are the properties of the binary heaps?

14. Define minimum spanning tree.

15. Explain the performance analysis of the algorithm.

PART - C (5 x 16 = 80 Marks)

16. (a) Define constructor. Explain types of constructor with example in C++. (16)

Or

(b) Explain in detail about constructors and destructors. Write a C++ program to compute the area of square, circle and rectangle using constructors. (16)

17. (a) Discuss the various types of inheritances with suitable examples. (16)

Or

(b) Explain how to handle multiple exceptions in C++ with an example. (16)

18. (a) Write suitable routines to perform the following operations in a doubly linked list ADT

(i) Insert 15, 67, 43, 21, 90 into a doubly linked list (6)

(ii) Delete 43 from the list. (6)

(iii) Find the position of an element 'X' in the doubly linked list. (4)

Or

(b) (i) Write a procedure to insert a new node in binary heaps. (6)

(ii) Given input {1, 64, 25, 16, 49, 4, 9.36, 81} and a hash function *h(x) = x (mod 10)*, show the resulting: (i) open hash table (ii) closed hash table using linear probing (iii) closed hash table using quadratic probing (iv) closed hash table with second hash function *h2(x) = 7 - (x mod7).* (10)

19. (a) Write routines to implement the basic Binary search tree operations

(i) Insert 3, 1, 4, 6, 9, 2, 5, 7 into an initially empty Binary search tree (6)

(ii) Delete element '4' from the tree (6)

(iii) Return the greatest element in the tree. (4)

Or

(b) Explain AVL tree with suitable example. (16)

20. (a) Explain in detail how the elements can be sorted using Quick sort? Sort the following elements 34, 67, 23, 15, 90, 82, 71, 59. (16)

Or

(b) Explain in detail about Divide and conquer algorithm with an example also mark the difference between Greedy and divide and conquer algorithm. (16)

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