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**Reg. No. :**

**Question Paper Code: 44080**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Fourth Semester

Electrical and Electronics Engineering

14UIT424-DATA STRUCTURES AND ALGORITHMS

(Common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

(Regulation 2014)

Duration: Threehours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. When overloading unary operators using Friend function, it requires\_\_\_\_\_

arguments.

(a)Zero (b)One (c)Two (d)Three

2. A Constructor that does not have any parameters is called\_\_\_\_\_\_\_\_\_\_\_\_

Constructor.

(a) Custom (b)Parameterized (c)Copy (d) Default

3. Class X, class Y and class Z are derived from class BASE. This is \_\_\_\_\_\_

inheritance.

 (a)Multiple (b) Multilevel (c)Hierarchical (d)Single

4. Generic pointers can be declared with\_\_\_\_\_\_\_\_\_\_

 (a)Auto (b)Void (c)Asm (d) Static

5. A queue is a, \_\_\_\_\_\_\_\_\_\_\_

 (a)First In First Out list (b)Last In First Out list (c)Ordered array (d) Linear tree

6. Which data structure is used for implementing recursion?

(a)Stack (b)Queue (c)Array (d)Tree

7. To obtain the values stored in binary tree in ascending, we do

 (a)Post order traversal (b)Pre order traversal (c)In order traversal (d)Depth first search

8. The postfix form of A\*B+C/D is

 (a)\*AB/CD+ (b)AB\*CD/+ (c)A\*BC+/D (d) ABCD+/\*

9. Which of the following sorting algorithm is of divide-and-conquer type?

 (a)Bubble Sort (b)Quick Sort (c)Heap Sort (d) Insertion Sort

10. The worst case of quick sort has order

(a)O(n2) (b)O(n) (c)O(n log n)(d)O (log n)

PART - B (5 x 2 = 10 Marks)

11. State the use of Constructor in C++.

12. Write a sample to code to show the usage of pointers in C++.

13. Define circular linked list and state its significance.

14. Sketch Binary expression Tree for the given postfix notation 1 2 + 3 \* 6 + 2 3 + /

15. Insertion sort is best suitable if the list is already sorted-Justify.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Write a C++ program to illustrate the static member function. (8)

 (ii)Explain Copy Constructor with suitable example. (8)

Or

(b) (i) Write a program using friend functions for overloading + , \*,- and / operators? (8)

 (ii)Explain the classes and object with an example. (8)

17. (a) What is inheritance? Discuss in detail about the various types of inheritance in

 C++ with suitable examples. (16)

Or

(b) What is Virtual function? Explain with an example how dynamic binding is achieved using virtual function. (16)

18. (a) Write down and explain the algorithms for basic operations on stack ADT. (16) Or

(b) Write an algorithm for inserting and deleting an element from doubly linked list. (16)

19. (a) Explain how to insert the elements 45, 32,56,23,40,48,83,7,84,24 in a Binary

 Search Tree and traverse the tree with suitable implementations. (16)

Or

 (b) Find the minimum spanning tree using Prim’s algorithm for the given graph. (16)

A

F

B

C

D

E

2

7

4

5

8

6

4

5

3

8

20. (a) Write a C program to sort the input elements 3,1,4,1,5,9,2,6,5,3,5 using quick

 sort with their step-wise iterations. (16)

Or

 (b) Model an algorithm to sort ‘n’ numbers using heap sort. Also sort the following

 values by applying maxheap strategy.

 18 21 3 11 9 14 25 22 17 19 15 . (16)