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**Question Paper Code: 41804**

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

Fourth Semester

Electrical and Electronics Engineering

14UIT424 - DATA STRUCTURES AND ALGORITHMS

(Common to EIE and ICE branches)

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- \_\_\_\_\_ is a default access specifier in class.  
(a) public                      (b) private                      (c) protected                      (d) friendly
- \_\_\_\_\_ operands are used for overloading of binary operator using member function.  
(a) 2                              (b) 3                              (c) 1                              (d) 0
- The void type is used for  
(a) Returning the value                      (b) Creating generic pointers  
(c) Creating functions                      (d) A void error
- Pick out the correct statement in function template  
(a) One function will work with many different types  
(b) it will take a long time to execute  
(c) duplicate code is increased  
(d) None of these
- A mathematical-model with a collection of operations defined on that model is called  
(a) Data Structure                      (b) Abstract Data Type  
(c) Primitive Data Type                      (d) Algorithm

6. Which is not the term used for Stack?  
(a) Pop (b) Rear (c) Push (d) Top
7. Which one of them is not a Balanced Factor in AVL Tree?  
(a) 2 (b) 1 (c) -1 (d) 0
8. How many loops are there in Minimum Spanning Tree?  
(a) One (b) Two (c) Many (d) None
9. The complexity of Bubble sort algorithm is  
(a)  $O(n)$  (b)  $O(\log n)$  (c)  $O(n^2)$  (d)  $O(n \log n)$
10. Which of the following algorithm design technique is used in the quick sort algorithm?  
(a) Dynamic programming (b) Backtracking  
(c) Divide and conquer (d) Greedy method

PART - B (5 x 2 = 10 Marks)

11. List out the rules for defining operator overloading.
12. Write the syntax of pure virtual function.
13. Define Algorithm. List the characteristics of an algorithm.
14. Show the result of inserting 5, 8, 9, 4, 2, 7, 3, 1 into an empty AVL tree.
15. Define Sorting. List out its types.

PART - C (5 x 16 = 80 Marks)

16. (a) Define classes and objects and write their syntax. Explain any three control structures with an example. (16)

Or

- (b) What is dynamic initialization of objects? Why is it needed? How is it accomplished in C++? Illustrate. (16)

17. (a) Write a C ++ program to count and display the number of BLANK SPACES in an existing text file notes.txt. (16)

Or

- (b) Define exception handling and list the keywords involved in it. Describe their usage with suitable examples. (16)

18. (a) Explain about lists and types of list in detail with suitable diagrams and example code. (16)

Or

- (b) Write an ADT to implement stack of size N using an array. The elements in the stack are integers. The operations to be supported are PUSH, POP and DISPLAY. Taken into account the exceptions of stack overflow and stack underflow. (16)

19. (a) Explain Binary tree and Binary Search tree in detail with example diagrams. (16)

Or

- (b) Write routines to implement the basic binary search tree operations with suitable examples. (16)

20. (a) Explain a sorting technique which follows divide and conquer mechanism with an example. (quick & merge sorts). (16)

Or

- (b) Explain Selection Sort algorithm in detail. Perform selection sort using the following elements: 73, 35, 42, 13, 87, 24, 64 and 57. (16)

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