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

Question Paper Code: 33223

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

Third Semester

Electronics and Communication Engineering

01UCS323 - DATA STRUCTURES AND ALGORITHM ANALYSIS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Define destructor.
2. How is member function of a class defined?
3. Write syntax for class template.
4. What do you mean by stack unwinding?
5. Define Linked List. List the types of Linked List.
6. Write brief note on properties of binary heap.
7. Prove that the maximum number of nodes in a binary tree of height h is $2^h - 1$.
8. Point out the balance condition of AVL Tree.
9. Write the steps involved in bucket sorting.
10. What is internal sorting? List its types.

PART - B (5 x 16 = 80 Marks)

11. (a) Design a matrix and vector classes with necessary properties. Write a *C++* program to multiply vector and matrix class objects using Friend function. (16)

Or

(b) Analyze the various loop structures with examples. (16)

12. (a) Explain exception handling mechanism with an example. (16)

Or

(b) Write a *C++* program to design a template for generic queue with their necessary operations. (16)

13. (a) Write a procedure to insert and delete an element in a single linked list. (16)

Or

(b) Explain with an example the formation of heap data structure and the properties to be found in a heap. (16)

14. (a) Explain the following routines in AVL tree with an example: (i) Insertion (ii) Single Rotation and (iii) Double Rotation. (16)

Or

(b) Write a routine to insert and delete an element in binary search tree. (16)

15. (a) Enumerate insertion sort algorithm with an example. (16)

Or

(b) Write the routine for the quick sort and estimate its worst, average and best case time complexities. Also, sort the following key values using quick sort. 65, 70, 75, 80, 85, 60, 55, 50, 45. (16)

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