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

Question Paper Code: 33223

B.E. / B.Tech. DEGREE EXAMINATION, NOV 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. How is member function of a class defined?
2. Define operator overloading.
3. State the use of pointer.
4. Write syntax for class template.
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. Define NP-Complete problem.
9. Write the steps involved in bucket sorting.
10. Distinguish between dynamic programming and divide and conquer.

PART - B (5 x 16 = 80 Marks)

11. (a) Write a C++ program that

(i) Multiply two matrices and print the result.

(ii) Find the square root of a number. (16)

Or

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

12. (a) (i) Illustrate the types of inheritance with suitable examples. (12)

(ii) Describe about virtual functions. (4)

Or

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

13. (a) (i) Write a procedure to insert and delete an element in a single linked list. (10)

(ii) Evaluate the following postfix expression using stack.

*E=A B C * D / +* where *A*=2 *B*=3 *C*=4 & *D*=6 (6)

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) (i) Explain prim's algorithm with appropriate example. (12)

(ii) What do you mean by network flow problem? (4)

15. (a) 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. (16)
65, 70, 75, 80, 85, 60, 55, 50, 45.

Or

(b) (i) Enumerate insertion sort algorithm with an example. (8)

(ii) Sort the following values using quick sort by choosing first element as the pivot.
65, 70, 75, 80, 85, 60, 55 50, 45 (8)

33223