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**B.Sc. DEGREE EXAMINATION, NOVEMBER 2019**

Second Semester

UCS18202 – DATA STRUCTURES

*(For the candidates admitted during the academic year 2018-2019 onwards)*

Time: Three hours Max. Marks: 100

Answer **ALL** Questions

**PART – A (10 × 2 = 20 Marks)**

1. How a recursive function executes?
2. What are the factors used to analyse a program.
3. List down the properties of a stacks.
4. What is a queue? Write one example that represent the concept of queue.
5. Pen down the definition of an expression tree.
6. Write the difference between a full binary tree and a complete binary tree.
7. Define: 'sorting'.
8. Write the need for pivot element in Quick sort algorithm.
9. Define connected graph.
10. What is the difference between a general tree and a spanning tree?

## PART – B (5 × 16 = 80 Marks)

11. a. Illustrate the concept of recursion to find the factorial using of a number program in C.

**(OR)**

b. List out the operations of an array. Write the Pseudocode for performing "Insert operation" in an array.

12. a. Write the steps for evaluating a prefix expression and convert the following infix expression into prefix expression $\big((a/b)+(b-c)\big)/2$.

**(OR)**

b. How will you represent an array as an queue? Write a program to illustrate insertion and deletion in a queue.

13. a. Explain general tree representation with a neat sketch. Classify Binary Tree traversal. Explain Inorder traversal and write algorithm for the same.

**(OR)**

b. What is an AVL Tree? Write the advantages of AVL tree. How will you represent a node in an AVL tree?

14. a. Describe how the algorithm of quick sort works.

**(OR)**

b. Explain the followings:
   (i) binary search
   (ii) Indexed sequential search.



15. a. Explain the terms
   i. Directed graph
   ii. Undirected graph
   iii. Weighted graph
   iv. Edges
   v. Cyclic graph

**(OR)**

b. Write Depth First Search (DFS) algorithm for the traversal of any graph.

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