

**Q.P. Code – 42235**

**Second Semester B.Sc. Degree Examination, September 2020**

*(CBCS Scheme)*

**Computer Science**

**DATA STRUCTURE USING C++**

*Time : 3 Hours]*

*[Max. Marks : 90*

*Instructions to Candidates : Answer all Sections.*

**SECTION – A**

I. Answer any **TEN** questions : **(10 × 1 = 10)**

1. Define datastructures.
2. What is the difference between primitive and non-primitive datastructure?
3. What is the purpose of realloc( ) function?
4. What is the function of getnode( ) in linke list?
5. Define singly linked list.
6. What is the purpose of isempty( ) operation in stack?
7. Write any one applications of stacks.
8. Define Infix notation.
9. Define Priority Queue.
10. Define Siblings in Binary Tree.
11. What is strictly Binary Tree?
12. Define Sorting.

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**SECTION – B**

II. Answer any **FIVE** questions :

**(5 × 3 = 15)**

13. Write the differences between linear and non-linear datastructure.
14. Write the advantages of linked list over Arrays.
15. Write an Algorithm for PUSH operations in Stacks.
16. Convert  $(A + B) * (C - D) + E$  into prefix expression.
17. What is dynamic memory allocation? What are its advantages?
18. Write an Algorithm to sort  $n$  elements using Bubble Sort Technique.
19. Write a note on AVL Tree.

**SECTION – C**

III. Answer any **SIX** questions :

**(6 × 5 = 30)**

20. Write a program to create and display doubly linked list.
21. Write a program to convert Infix to Postfix expression.
22. Write a program to implement Queues using linked list.
23. Explain Tree Traversal Techniques with an example.
24. What is adjacency matrix? Explain with a suitable graph.
25. Write an Algorithm to sort  $n$  elements using Insertion sort technique.
26. What is recursion? Explain with suitable example program.
27. What is Spanning tree? Write any four spanning trees for the following graph.



**SECTION – D**

IV. Answer any **FIVE** questions : (5 × 7 = 35)

28. (a) Write a program to illustrate Binary Search.  
(b) Write a program to sort  $n$  array elements using selection sort. (4 + 3)
29. (a) Write a program to create and display circular linked list.  
(b) Write an algorithm for POP operations in stacks. (4 + 3)
30. Solve the Tower of Hanoi problem with three disks using suitable representation.
31. (a) Write a program to implement stacks using linked list.  
(b) Write any four applications of stacks. (4 + 3)
32. Construct BST for the following elements :  
10, 16, 29, 11, 13, 28, 40, 6, 3, 12, 7
33. (a) Explain the terms trial, walk, path with suitable diagram.  
(b) Explain complete Binary Tree. (3 + 4)
34. (a) Explain the linked representation of graph with suitable example.  
(b) What is a Dequeue? Explain different types of Dequeue. (4 + 3)

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