

**II B. Tech I Semester Supplementary Examinations, May - 2018****DATA STRUCTURES THROUGH C++**

(Com to CSE &amp; IT)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **FOUR** Questions from **Part-B**
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**PART -A**

1. a) What is sparse Matrix? Discuss. (2M)
- b) Define Abstract Data Type. (2M)
- c) What is meant by PUSH and POP on Stack? (3M)  
What is State of the STACK After insert 12, 75, 04, 100, 23, POP, POP, Insert 11, POP?
- d) What are the steps to insert a new item at the head of a double linked list? (3M)
- e) Draw the binary search tree for the following: 40, 67, 71, 33, 91, 56, 22, 32 (2M)
- f) What are the applications of Graphs? (2M)

**PART -B**

2. a) Explain about addition of two polynomials and write a program using arrays? (9M)
- b) Explain about ADTs with suitable examples. (5M)
3. a) Represent container class using templates and give example C++ program for the container class? (7M)
- b) Differentiate array and linked list representation of Stack. (7M)
4. a) Write a C++ function length to count the number of nodes in a chain. What is the time complexity of your function? (9M)
- b) Explain about Iterators in C++? (5M)
5. a) Write an algorithm for in-order traversal of a binary tree. Explain with an example (7M)
- b) What is Binary Tree? What are the operations of Binary tree? Discuss (7M)
6. a) Write an algorithm for minimum cost spanning tree using prim's Algorithm (9M)
- b) What is Transitive Closure? Explain (5M)
7. a) Explain the algorithm for QUICK sort ( partition exchange sort) and give a suitable example (7M)
- b) Demonstrate the insertion sort results for each insertion for the following initial array of elements. 25 6 15 12 8 34 9 18 2 (7M)

