

Roll No .....

## MCSE/MSE-102

M.E./M. Tech., I Semester

Examination, December 2016

### Advanced Data Structure and Algorithm

Time : Three Hours

Maximum Marks : 70

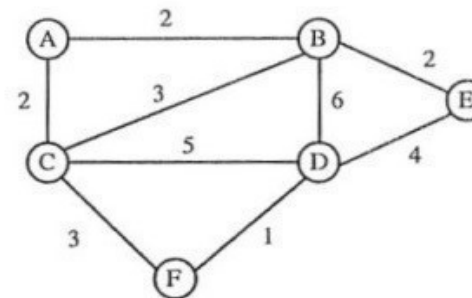
Note: Attempt any five questions. All questions carry equal marks.

1. a) How are two dimensional arrays represented in computer? Explain with example. Also give the procedure to calculate the address of an element of the array. 7  
b) Give the linked representation of the following polynomial :  $7x^3y^2 - 8x^2y + 3xy + 11x - 4$  7
2. a) Write a procedure to create a singly linked list and reverse the list by interchanging the links and not the data : 7  
b) What do you understand by a multiple stack? How is it useful? Explain how stacks are used in a non-recursive program. 7
3. a) Discuss different types of complexities which can be analyzed for an algorithm with the help of an example. 7  
b) Construct an AVL tree by inserting the following elements in the given order. 63, 9, 19, 27, 18, 108, 99, 81. 7
4. a) Create a binary search tree with the input given : 7  
98, 2, 48, 12, 56, 32, 4, 67, 23, 87, 23, 55, 46  
i) Insert 21, 39, 45, 54, and 63 into the tree  
ii) Delete values 23, 56, 2 and 45 from tree  
b) Heaps are excellent data structures to implement priority queue - Justify this statement. 7

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5. a) Explain splay tree in detail with relevant examples. 7  
b) Consider graph below and find the minimum spanning tree of this graph using Prim's algorithm. 7



6. a) Explain depth first search and breadth first search traversal of a graph with an example. 7  
b) Discuss the boundary tag method to allocate and free the variable size nodes. 7
7. a) Discuss various memory allocation strategies? Write algorithms to allocate and free nodes in a buddy system of memory allocation. 7  
b) Write down the quick sort algorithm to sort the list using in example. 7
8. a) Explain the concept of dynamic programming. Write down the advantages of this technique. 7  
b) Write short note : 7  
i) Backtracking  
ii) Merge sort

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