

**II B. Tech I Semester Regular Examinations, Dec - 2014****DATA STRUCTURES**

(Com. to ECE, CSE, EIE, IT, ECC)

Time: 3 hours

Max. Marks: 70

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

1. a) Define Recursion with example  
 b) Differentiate between linear search and binary search  
 c) Discuss about the transformation from infix to postfix.  
 d) Write a short note on circular linked list.  
 e) Explain about the operations on a singly linked list.  
 f) Discuss post order traversal in a binary tree.  
 g) What is Threaded binary tree?  
 h) Explain about adjacency matrix with example. (3M+2M+3M+3M+3M+3M+2M+3M)

**PART-B**

2. a) Sort the following numbers using merge sort  
 45, 34, 12, 46, 27, 56, 11, 87, 6, 33, 28  
 b) Write an algorithm for Quick sort and also analyze the time complexity. (8M+8M)
3. a) Differentiate between stack and Queues.  
 b) Write programs for implementing stacks and queues. (8M+8M)
4. a) What are the operations of a singly linked list? Discuss.  
 b) Write an algorithm to sort the elements in a linked list. (8M+8M)
5. a) Write a non recursive algorithm for preorder traversal in a tree with an example.  
 b) What is a balanced binary tree? How it is different from the BST? Discuss. (8M+8M)
6. a) What is a Binary Tree? How to represent binary tree? Explain.  
 b) Write an algorithm for creation of binary tree using in-order traversal and post order traversals. (8M+8M)
7. a) Discuss about any one shortest path algorithm.  
 b) Differentiate between DFS and BFS.  
 c) How to represent graphs? Explain. (4M+4M+8M)

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**PART-A**

1. a) Write an algorithm for Fibonacci sequence
- b) Explain about bubble sort.
- c) What is stack? Discuss.
- d) What are the applications of singly linked list?
- e) Write a short note on doubly linked list.
- f) Explain about the Binary Tree with example.
- g) Define binary search tree with example.
- h) Write a short note on prim's algorithm. (3M+3M+3M+3M+2M+2M+3M+3M)

**PART-A**

2. a) Sort the following numbers using Quick sort  
45, 34, 12, 46, 27, 56, 11, 87, 6, 33, 28
- b) Write an algorithm for merge sort and also analyze the time complexity (8M+8M)
3. a) How to represent Queues? Discuss.
- b) Write an algorithm for infix to postfix conversion. (8M+8M)
4. a) Explain about the insert and delete operations in a singly linked list.
- b) Write an algorithm to reverse a given linked list. (8M+8M)
5. a) What is balanced binary tree? What are the applications of it?
- b) Write a non recursive algorithm for post order traversal with an example. (8M+8M)
6. a) What is a Binary tree? What are the properties of Binary tree?
- b) Write an algorithm for the creation of binary tree using pre-order traversal and In-order traversal. (8M+8M)
7. a) Discuss about Warshall's algorithm with example
- b) What is BFS? Which traversing technique is used in BFS and also explain the concept of BFS with example. (8M+8M)

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**PART-A**

1. a) Write an algorithm for the computation of GCD.  
 b) What are the applications of stack?  
 c) Define Circular queue with example.  
 d) What is sparse Matrix? Discuss.  
 e) What are the properties of Binary trees.  
 f) What is the need of balanced binary trees?  
 g) Explain about the warshall's algorithm.  
 h) What is transitive closure? Explain (3M+2M+3M+3M+3M+2M+3M+3M)

**PART-A**

2. a) Sort the following numbers using heap sort  
 45, 34, 12, 46, 27, 56, 11, 87, 6, 33, 28  
 b) Write an algorithm for bubble sort and also analyze the time complexity (8M+8M)
3. a) How to represent stacks? Discuss.  
 b) Write a program to evaluate postfix expressions. (8M+8M)
4. a) How to represent single linked list? Discuss.  
 b) Write an algorithm to delete duplicates in a linked list. (8M+8M)
5. a) Explain about the insert procedure in binary search tree.  
 b) Write an algorithm for deleting an element from a binary search tree. (8M+8M)
6. a) Discuss about different binary tree traversals with examples.  
 b) Write a short note on Threaded Binary trees. (10M+6M)
7. a) What is minimum cost spanning Tree? Discuss with example.  
 b) What is DFS? Which traversal technique is used for the DFS and also explain the concept of DFS with example. (8M+8M)

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**PART-A**

1. a) Which sorting technique is efficient? Discuss.
- b) What are the applications of Queues?
- c) Define Priority Queue with example.
- d) What are the advantages of linked list?
- e) Explain about the binary tree traversals using recursion with examples.
- f) What are the applications of balanced binary trees? Explain.
- g) Explain about the delete procedure for binary search tree.
- h) Differentiate between DFS and BFS. (2M+2M+3M+2M+4M+3M+3M+3M)

**PART-B**

2. a) Sort the following numbers using insertion sort  
45, 34, 12, 46, 27, 56, 11, 87, 6, 33, 28
- b) Write an algorithm for heap sort and also analyze the time complexity. (8M+8M)
3. a) Discuss about the stack with examples
- b) Write an algorithm to implement queue using stack. (8M+8M)
4. a) Differentiate between doubly and circular linked lists.
- b) Write an algorithm to insert, delete and display the elements in a given doubly linked list. (6M+10M)
5. a) What is a Binary search tree? Discuss.
- b) Write an algorithm for insert an element into a binary search tree. (10M+6M)
6. a) What are the operations that can be performed on a binary tree? Discuss.
- b) Write the non-recursive procedures for tree traversals (8M+8M)
7. a) What is a Graph? How graphs can be represented? Discuss.
- b) Explain about the prim's algorithm with example. (8M+8M)