

II B. Tech I Semester Regular/Supply Examinations, Oct/Nov - 2016**DATA STRUCTURES**

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

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 **THREE** Questions from **Part-B**

PART -A

1. a) Compare between linear search and Binary search (4M)
- b) What are the applications of stack? (4M)
- c) What are the advantages of circular linked list. (4M)
- d) Write the routine for in-order traversal of Binary tree. (4M)
- e) Define balanced binary tree? (3M)
- f) What is minimum spanning tree? Explain. (3M)

PART -B

2. a) Explain about Towers of Hanoi problem. (8M)
- b) Write a program for sorting the given elements using quick sort. (8M)
3. a) What is stack? How to represent stacks? Explain. (8M)
- b) Write a program for performing queue operations. (8M)
4. a) What are the advantages and disadvantages of linked list.? (8M)
- b) Swap two adjacent elements by adjusting only the pointers using singly linked lists. (8M)
5. a) Explain about the binary tree traversing techniques. (8M)
- b) Write a program that accepts a pointer to a node and returns TRUE if that node is the root of a valid binary tree and FALSE otherwise (8M)
6. a) What is BST? Explain the operations of BST. (8M)
- b) Prove that the depth of a random binary search tree is $O(\log n)$, on average. (8M)
7. a) What is Graph? How to represent graphs? Explain. (8M)
- b) Discuss about BFS with example. (8M)

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PART -A

1. a) What is recursion? Give examples. (4M)
- b) Differentiate between circular queue and priority queue. (4M)
- c) What are the disadvantages of circular linked list. (4M)
- d) What are the operations of binary tree? Explain. (4M)
- e) Define Threaded Binary tree. (3M)
- f) Define DFS. (3M)

PART -B

2. a) Explain about the heap sort with an example. (8M)
- b) Write a program for Fibonacci search. (8M)
3. a) What is stack? What are the applications of stack? Explain. (8M)
- b) How to implement the Queues? Explain. (8M)
4. a) What are the advantages and disadvantages of doubly linked list.? (8M)
- b) Swap two adjacent elements by adjusting only the pointers using doubly linked lists. (8M)
5. a) Explain about the creation of binary tree using the preorder and postorder traversals (8M)
- b) Write a program for the creation of binary tree using the preorder and postorder traversals (8M)
6. a) Explain about the rotations in AVL tree. (8M)
- b) Give a precise expression for the minimum number of nodes in a n AVL tree of height h. (8M)
7. a) Explain about the kruskal's algorithm with example. (8M)
- b) How to represent graphs? Explain. (8M)

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PART -A

1. a) Write short notes on algorithm analysis and complexity. (4M)
- b) What the applications of stack? Explain. (4M)
- c) How to represent polynomial expressions using linked list? Explain. (4M)
- d) What are the properties of Binary trees? (3M)
- e) What are the applications of Balanced binary tree? (4M)
- f) Define transitive closure. (3M)

PART -B

2. a) Discuss about the merge sort with an example. (8M)
- b) Write a program to sort the given elements using the radix sort. (8M)
3. a) What is Queue? What are the applications of Queue? Explain. (8M)
- b) Write a program for evaluating an arithmetic expression. (8M)
4. a) Explain about circular linked lists. (8M)
- b) Given two sorted lists, L_1 and L_2 , write a procedure to compute $L_1 \cap L_2$ using only the basic list operations. (8M)
5. a) Explain about the creation of binary tree using the preorder and inorder traversals (8M)
- b) Write a program for the creation of binary tree using the preorder and inorder traversals (8M)
6. a) Explain the procedure for deleting an element from a binary search tree (8M)
- b) Write a routine for inserting an element into the binary search tree. (8M)
7. a) Explain about the prim's algorithm with example. (8M)
- b) Discuss about BFS with example. (8M)

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PART -A

1. a) Discuss about bubble sort. (4M)
- b) Define priority queue. (3M)
- c) Write a program to print out the elements of the linked list. (4M)
- d) Explain about different binary tree traversal techniques. (4M)
- e) What is Balanced binary tree? What is the need of this tree? (4M)
- f) What are the applications of Graphs? (3M)

PART -B

2. a) Explain about different searching mechanisms. (8M)
- b) Write a program for sorting the given elements using insertion sort. (8M)
3. a) Define Queue? Differentiate between Queue and circular queue. (8M)
- b) Write a program for converting infix to postfix expression. (8M)
4. a) Define linked list? What are the applications of linked list? Explain. (8M)
- b) Given two sorted lists, L_1 and L_2 , write a procedure to compute $L_1 \cup L_2$ using only the basic list operations. (8M)
5. a) How to represent binary trees? Explain. (8M)
- b) Show that the maximum number of nodes in a binary tree of height h is $2^{h+1}-1$. (8M)
6. a) Explain about the single and double rotations with examples (8M)
- b) Write routine for deleting an element from the binary search tree. (8M)
7. a) What are different Graph Traversal techniques? Explain. (8M)
- b) Discuss about Dijkstra's algorithm. (8M)
