

II B. Tech I Semester Supplementary Examinations, September - 2021
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**
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PART -A

1. a) Define Recursion (2M)
- b) What are the applications of circular queue? (4M)
- c) Differentiate between single linked list and double linked list? (5M)
- d) What are the properties of binary tree? (4M)
- e) Define Balanced binary tree? (2M)
- f) What are the properties of Minimum Cost Spanning (MST) Tree? (5M)

PART -B

2. a) Explain the recursive merge sort algorithm to sort the following elements: 12, 25, 5, 9, 1, 84, 63, 7, 15, 4, 3. (8M)
- b) Construct max heap for the following: 140, 80, 30, 20, 10, 40, 30, 60, 100, 70, 160, 50, 130, 110, 120 (8M)
3. a) Convert the given infix expression $A+B^{\wedge}C+(D^{\wedge}E/F)^{\wedge}G$ into its postfix expression, and evaluate the same using stack. Here A=3, B=5, C=2, D=7, E=4, F=1, G=8. (8M)
- b) What are the applications of priority queues? (8M)
4. a) Compare singly and circular linked list while performing insertion and deletion operations (8M)
- b) Write the advantages and disadvantages of linked lists. (8M)
5. a) A binary tree has seven nodes. The Preorder and Postorder traversal of the tree are given below. Can you draw the tree? Justify. Preorder : GFDABEC Postorder : ABDCEFG (8M)
- b) What are the different tree traversals? Explain with example. (8M)
6. a) What is a binary search tree? Write an algorithm for inserting and deleting a node in a binary search tree. (8M)
- b) Write an iterative function to search for a key value in Binary search tree. (8M)
7. a) Explain Warshall's algorithm to find transitive closure of a graph with a suitable example. (8M)
- b) Differentiate between DFS and BFS? (8M)