

## III B. Tech II Semester Supplementary Examinations, April -2021

## DATA STRUCTURES

(Electrical and Electronics Engineering)

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**

**PART -A****(14 Marks)**

1. a) What does abstract data type mean? [2M]
- b) What are the different queue operations? [2M]
- c) What are the applications of linked lists? [2M]
- d) How binary tree is different from binary search tree? [3M]
- e) Define a graph. What are the graph traversal techniques? [3M]
- f) Differentiate Linear search and binary search. [2M]

**PART -B****(56 Marks)**

2. a) How insertion and deletion operations are carried out in linear arrays? Explain. [7M]
- b) Explain string operations with examples. [7M]
3. a) Convert the infix expression  $a/b-c+d*e-a*c$  into postfix expression and trace that postfix expression for given data  $a=6, b=3, c=1, d=2, e=4$ . [7M]
- b) What is recursion? Give a recursive algorithm for towers of Hanoi problem. [7M]
4. a) Which are the different primitive operations associated with linked list? Write a pseudo code to insert an element into Singly linked list. [7M]
- b) What is a sparse matrix? What are its drawbacks? Explain lower triangular sparse matrix with suitable example. [7M]
5. a) What are the different binary tree traversal techniques? Illustrate. [7M]
- b) Construct a B-tree of order 3 with the following elements: [7M]  
 10, 20, 15, 3, 2, 16, 21, 25, 30, 40.
6. a) Explain prim's algorithm with an example. [7M]
- b) Write the advantages of using BFS over DFS or using DFS over BFS? What are the applications and drawbacks of each? [7M]
7. a) Write an algorithm for Fibonacci search. [7M]
- b) Apply insertion sort on the following elements: 3, 1, 4, 7, 5, 9, 2, 6, 5, and 10. [7M]

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