

**I B. Tech II Semester Supplementary Examinations, Nov/Dec - 2019****DATA STRUCTURES**

(Com. to ECE, EIE, E Com E)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is Compulsory  
 3. Answer any **FOUR** Questions from **Part-B**
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**PART -A**

1. a) Define sparse matrix. (2M)
- b) Convert the following infix expression into postfix expression:  $A+B^{(C+D)}-E \cdot F+G$ . (2M)
- c) List advantages of linked list over arrays. (2M)
- d) Write the importance of a threaded binary tree. (2M)
- e) List any two differences between graphs and trees. (2M)
- f) Write about heap sort technique. (2M)
- g) List the advantages of circular linked list over single linked list. (2M)

**PART -B**

2. a) Explain representation of array as an ADT along with their advantages and disadvantages. (7M)
- b) Write ADT for an array implementation of polynomial addition. (7M)
3. a) Explain the procedure to evaluate postfix expression. Evaluate the following Postfix expression  $7\ 3\ 4\ +\ -\ 2\ 4\ 5\ /\ +\ *\ 6\ /\ 7\ +$ . (7M)
- b) Explain the basic operations of queue with pseudo code. (7M)
4. a) Write an algorithm to push and pop an element from linked stack. (7M)
- b) List various operations of linked list and explain how to insert a node anywhere in the list. (7M)
5. a) How to represent binary tree using arrays and linked list? (7M)
- b) Write in-order, pre-order and post-order traversal of a binary tree. (7M)
6. a) What are connected components of graph? Is there any method to find out all the Connected components of graph? Explain. (7M)
- b) Discuss Kruskal's algorithm advantages and disadvantages. (7M)
7. a) Compare and contrast iterative merge sort with recursive merge sort. (7M)
- b) Explain heap sort with an example. (7M)