

I B. Tech II Semester Supplementary Examinations, March - 2022

DATA STRUCTURES

(Com. to ECE, EIE, E Com)

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**
- ~~~~~

PART -A

1. a) Discuss operations performed with polynomials. (2M)
- b) Write the differences between stack and queue. (2M)
- c) What are the applications of priority queues? (2M)
- d) How many binary trees are possible with four nodes? (2M)
- e) Define transitive closure. (2M)
- f) List any two differences between graphs and trees. (2M)
- g) What is the time complexity of merge sort? (2M)

PART -B

2. a) Explain representation of arrays along with their advantages and disadvantages. (7M)
- b) What is sparse matrix? How is it implemented using arrays? (7M)
3. a) Write an algorithm to insert and delete a key from circular queue. (7M)
- b) Discuss the procedure to convert infix expression to postfix expression with the following expression: $((A - (B+C) * D) / (E+F))$ (7M)
4. a) Write an algorithm to insert a node in a doubly linked list and discuss with example. (7M)
- b) Explain how linked list can be used for representing polynomials using a suitable Example. (7M)
5. a) Illustrate threaded binary tree with an example. (6M)
- b) Create binary search tree for the following elements (23, 12, 45, 36, 5, 15, 39, 2, 19). Discuss about the height of the above binary search tree. (8M)
6. a) Define the following terms with respect of a graph: (7M)
 i) Degree of vertex ii) Incident edge iii) Directed edge iv) Path
- b) Write prims algorithm for finding minimum cost spanning tree. (7M)
7. a) "Selecting the pivot element plays vital role in Quick sort" support this statement with proper explanation. Explain various choices available for selecting the pivot. (8M)
- b) Sort the following numbers using Insertion sort. For the Given Numbers : 34,8, 14, 61,4, 53,81, 47 (6M)