III B. Tech II Semester Supplementary Examinations, February-2022
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**

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PART –A   (14 Marks)

1. a) Differentiate Single Dimensional Array and Multi-Dimensional Array. [2M]
    b) What is a Dequeue? How is it different from a regular Queue? [2M]
    c) List out the Advantages with Linked lists. [2M]
    d) Define Binary search Tree. Give an example. [3M]
    e) Define Minimum cost spanning Tree. [2M]
    f) Perform Binary Search on the given elements to find "48" [3M]
       Elements: 18 22 29 35 41 48 52

PART –B   (56 Marks)

2. a) Define Abstract Data type? How to calculate the Time and Space complexity of a program? Explain. [7M]
    b) What is a Linear Array? Write Algorithm to perform insert and delete operations in linear Array. [7M]

3. a) Construct a Postfix Expression from the given Infix expression using stack: [7M]
    $$(A + (B * C)/(D - E))$$
    b) Demonstrate the postfix evaluation using stack for the given postfix expression: $ABC^* + D -$ Assume: $A = 4, B = 3, C = 2$ and $D = 5$. [7M]

4. a) Distinguish Pointer array and Array of pointers with suitable examples. [7M]
    b) Discuss about the operations that can be performed on a single linked lists. [7M]

5. a) Illustrate the Binary Search Tree construction using the following elements: [9M]
       25 20 36 30 22 10 40 5 12 28 38 48
    b) Define a Heap. Explain about Max Heap Operations. [5M]

6. a) Define the following graph terminology with respective diagrammatical representation: [8M]
       (i) Directed Graph   (ii) Undirected Graph   (iii) Weighted Graph
       (iv) Cyclic Graph
    b) Discuss about Breadth First Search with an example. [6M]

7. a) Elaborate Quadratic Hashing and Double Hashing with an Example. [7M]
    b) Perform Bubble Sort for the following elements. [7M]
       Elements: 5 1 4 2 8 6
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