Code No: R1632024 **R16** SET - 1

III B. Tech II Semester Supplementary Examinations, November -2019

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) Define Data Structure. Write some applications of data structure. [2M]
   b) Define stack. What are the stack operations? [2M]
   c) What is the importance of void pointer? [2M]
   d) Write some properties of binary tree. [3M]
   e) Explain graph ADT. [3M]
   f) Define sorting. List out some sorting techniques. [2M]

PART –B **(56 Marks)**

2. a) How to calculate space and time complexity of an algorithm? Illustrate. [7M]
   b) Write a short note on multi-dimensional arrays. [7M]

3. a) Show the detailed contents of stack to evaluate the given postfix expression: {1 2 3 + * 3 2 1 – + *}. [7M]
   b) Write an algorithm to find factorial of a given number using recursion. [7M]

4. a) List out the differences between array and linked list. [7M]
   b) Write the procedure to add two polynomials using linked list. [7M]

5. a) Define a Max Heap. Construct a max heap for the following: {12, 15, 9, 8, 10, 18, 7, 20, 25}. [7M]
   b) How can we make an unbalanced tree as a balanced one? Explain various rotations that are involved in it. Give examples for each rotation. [7M]

6. a) Differentiate BFS and DFS. [7M]
   b) Explain Kruskal's algorithm with an example. [7M]

7. a) Explain quick sort algorithm and simulate it for the following data: 20, 35, 10, 16, 54, 21, and 25. [7M]
   b) Write an algorithm for linear search. [7M]

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