R18 Regulation *Subject code: 2P3EB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech III Supplementary Examinations, March/April 2023

DATA STRUCTURES

(COMPUTER SCIENCE & ENGINEERING)

Maximum Marks: 70 Date:29.03.2023 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 Define Recursive algorithms
2 Explain Data objects and Structures
3 Describe Single & Two dimensional arrays
4 What is Stack ADT
5 Define Binary trees
6 What is Path compression
7 Explain hash functions,
8 Describe Merge sort
9 Write the Complexity analysis
10 Write about Comparison of Search Trees.

Part-B

Answer All the following questions. (5X10M=50Marks)

11 a) Explain Time complexity and space complexity with examples? (6M)
b) Describe Asymptotic Notations with examples? (4M)

OR

12 a) Describe Linear and Non-Linear data structures. (5M)
b) Define Complexity Analysis Examples. (5M)

13 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. (5M)
b) Write a C++ program to implement multiple stacks using single array. (5M)

OR

14 a) Explain Doubly Linked Lists- Insertion and Deletion Operations with examples. (5M)
b) Explain Circular Queues-Insertion and deletion operations with examples. (5M)

15 a) What is Binary tree and explain Properties of Binary Trees & Binary Tree ADT? (5M)
b) Explain Smart union algorithms with examples? (5M)

OR

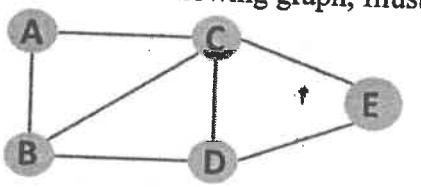
16 What is Max Heap? Explain Insertion into a Max Heap, Deletion from Max Heap operations? (10M)

17 a) Explain Linear Search and Binary Search with examples? (5M)
b) What is Hashing and Explain Hash tables? (5M)

OR

18 a) What is Sorting and explain Radix Sort & Quick sort(5M)
b) Explain Basic external sorting algorithm? (5M)

19 a) Consider the following graph, Illustrate the working of DFS Algorithm? (5M)



b) Illustrate B-Trees with appropriate example? (5M)

OR

20 a) Construct AVL Trees for the Following-14,8,12,46,23,5,77,88,20? (5M)
b) Write a C++ function to find an element in a Binary search tree? (5M)