



R18 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code:2P3FB

B.Tech III Semester Supplementary Examinations, March/April 2023

DATA STRUCTURES (Information Technology)

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 abstraction.
- 2 Define class template.
- 3 List the steps to insert new element at the end of double linked list.
- 4 Convert the given expression from infix to prefix $K + L - M * N + (O \wedge P) * W / U / V * T + Q$
- 5 Write about threaded binary tree?
- 6 Differentiate complete binary tree and full binary tree.
- 7 Compare sequential search and binary search.
- 8 Compare heap sort and quick sort.
- 9 Write the applications of Binary Search Tree.
- 10 Differentiate between DFS & BFS.

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 A. Write a C++ program to demonstrate exception handling mechanism. (5M)
B. Over load operator < for class rectangle such that $r < s$ iff the area of r is less than that of s. (5M)
- 12 Write a C++ function to multiply two polynomials, compute the time of the function. (10M)
- 13 A. ADT for implementing circular queue. (5M)
B. Explain about polynomial representation with a suitable example. (5M)
- 14 A. Write the procedure to convert infix to postfix expression. (5M)
B. ADT for inserting and deleting elements in stack. (5M)
- 15 A. Discuss about the addition and deletion operations performed on a priority queue. (5M)
B. Define the following terms used in binary tree. (5M)
i) Siblings ii) height. iii) level
- 16 If the depth of the binary tree is k, the maximum number of nodes in the binary tree is $2^k - 1$. Justify. (10M)

- 17 A. Show the result of each exchange in quick sort for the given array of elements (5M)
26, 5, 37, 1, 61, 11, 59, 15, 48, 19
B. Array={ 1, 3, 5, 4, 6, 13, 10, 9, 8, 15, 17 } using the given array build a max-heap. (5M)
- OR
- 18 For the given array { 170, 45, 75, 90, 802, 24, 2, 66 } apply the Radix sort . (10M)
- 19 A. Explain the operations of B tree. (5M)
B. How the AVL tree differs from binary search tree. (5M)
- OR
- 20 A. Explain the insertion of an element in Red Black Tree. (5M)
B. Discuss the algorithm for Breadth First Search on a graph. (5M)