



R22 Regulation

Subject code: 4E3FC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, July 2024

DATA STRUCTURES

(INFORMATION TECHNOLOGY)

Maximum Marks: 60

Date:25.07.2024 Duration: 3 hours

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

Part-A		CO	Bloom Tx
All the following questions carry equal marks (10X1M=10 Marks)			L1
1.a)	List the advantages of circular linked list over single linked list.	1	L1
b)	What is the difference between a queue and a stack?	1	L1
c)	Define a full binary tree.	2	L1
d)	What is the importance of a threaded binary tree?	2	L1
e)	What are the applications of priority queues?	3	L1
f)	What is B-tree of order m?	3	L1
g)	What is hashing?	4	L1
h)	What are binary trees?	4	L1
i)	Mention the different graph traversal techniques.	5	L1
j)	List out the applications of Depth first traversal.	5	L1
Part-B			Bloom Tx level
Answer All the following questions. (5X10M=50Marks)			
2	a) Write an algorithm to delete an element from doubly linked list. [5] b) List various operations of linked list and explain how to insert a node anywhere in the list. [5]	1	L2 L3
OR			
3	a) Define stack ADT. Explain basic operations of a stack ADT. [5] b) Define queue and write a program on queue using linked list representation. [5]	1	L2 L2
4	a) Construct a binary tree having the following traversal sequences: [5] Preorder traversal: A B C D E F G H I In order traversal: B C A E D G H F I b) Show that the maximum number of nodes in a binary tree of height H is $2^{H+1}-1$. [5]	2	L3 L1
OR			
5	a) Build an AVL tree with the following values: [5] {15, 20, 24, 10, 13, 7, 30, 36, 25, 42, 29} b) Write about Generic Programming. [5]	2	L3 L2

6	a) Write short notes on: [5] i) Red-Black trees ii) b-trees. b) Define priority queue. Discuss briefly about the heap representation of priority queue. [5]	3	L2 L2
OR			
7	a) Explain briefly about Min heap and d-heap with an example. [5] b) List and explain the applications of Priority Queues. [5]	3	L2 L2
8	a) What is meant by collision in hashing? Explain. [5] b) Explain hashing, hash table and a function with an example. [5]	4	L2 L2
OR			
9	a) Compare binary search and linear search techniques. [5] b) Write short notes on: i) Equivalence Relations ii) Dynamic Equivalence Problem. [5]	4	L2 L2
10	a) Discuss about shortest path problem with an example. [5] b) Define spanning tree. Describe how Kruskal's algorithm is different from Prim's algorithm for finding minimum cost spanning tree. [5]	5	L3 L3
OR			
11	a) Extend the Dijkstra's algorithm to find All-pairs-shortest-path (APSP) problem. [5] b) Write Kruskal's algorithm for finding minimum cost spanning tree. [5]	5	L3 L3