R22 Regulation *Subject code:4E3FC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Regular/Supplementary Examinations, December 2024

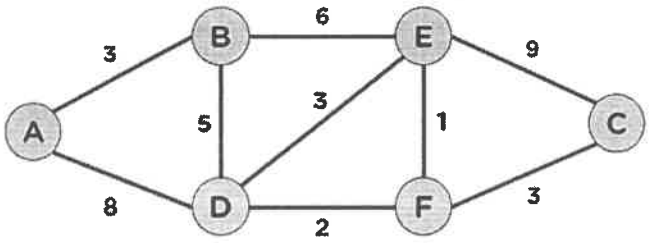
Data Structures

(IT)

Maximum Marks: 60 Date:09.12.2024 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)		
1.a)	What is abstract data type?	1	L1
b)	Write the applications of Linked lists?	1	L1
c)	Define Threaded Binary tree,	2	L1
d)	Write the applications of trees?	2	L1
e)	What operations are performed on Splay trees?	3	L1
f)	Define Priority queue,	3	L1
g)	What is a disjoint set?	4	L1
h)	Define Hashing.	4	L1
i)	Give example for adjacency list of a graph.	5	L1
j)	Distinguish between DFS and BFS.	5	L1
	Part-B		
Answer All the following questions.	(5X10M=50Marks)	CO	Bloom Tx
2	Write a program to implement stack operation Implement a queue data structure using Single Linked list. [10M]	1	L3
	OR		
3	Determine Circular Linked list and various operations on it [10M]	1	L3
4	a) In an initially empty AVL tree insert the following keys: DEC, JAN, APR,MAR, JUL, AUG, OCT, FEB, NOV. Draw AVL tree after every insertion and apply rotations where ever necessary [5M] b) Examine tree traversals with an example [5M]	2	L3
	OR		
5	Write a program to implement BST [10M]	2	L3
6	a) Construct insertion operation with following numbers into Red Black tree 45, 10, 8, 9, 34, 35, 12, 60, 90. [5M] b) Illustrate about Leftist heap with an example [5M]	3	L3
	OR		
7	What is a B-Tree? Construct a B-tree of order 3 for the following elements: 25,10,20,30,35,80,40,50,60,82,70,90,85,93 [10M]	3	L3

8	a) Write a program to implement Binary search [5M] b) Determine the advantages of extendible hashing [5M]	4	L3
	OR		
9	Examine rehashing and extendible hashing with an example [10M]	4	L3
10	Compute Kruskal's Algorithm with an example [10M]	5	L3
	OR		
11	a) Construct topological sort with an example [5M] b) Explain the Dijkstra's algorithm and find the shortest path from A to all other vertices in the following graph. [5m] 	5	L3