R20 Regulation *Subject code: 3P3EE & 3P3FC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, July 2024

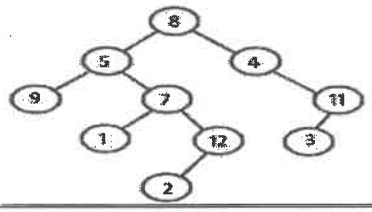
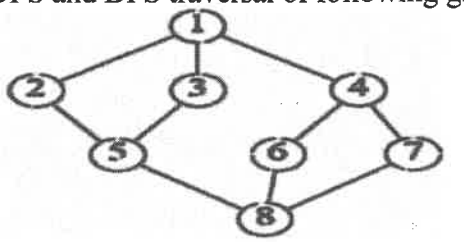
DATA STRUCTURES

(Common to CSE, CSE(AI&ML) & IT)

Maximum Marks: 70 Date:27.07.2024 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)		CO	Bloom Tx
1	Define Time Complexity and Space complexity.	1	L1
2	Define the term Data abstraction.	1	L1
3	State the different types of linked lists.	2	L1
4	List the applications of stack.	2	L1
5	Define tree.	3	L1
6	Define path in a tree.	3	L1
7	What is searching? List various search methods.	4	L1
8	Define Insertion sort.	4	L1
9	Define AVL tree with example.	5	L1
10	Define balanced search tree.	5	L1
Part-B			
Answer All the following questions. (5X10M=50Marks)			
11	What is recursion? What are the conditions for a recursive function to run? Write a recursive function to implement the reversing a number? [10]	1	L2
	OR		
12	Discuss about various asymptotic notations with examples. [10]	1	L2
13	Write a procedure to implement the following stack operations using arrays and linked list i) push ii) pop [10]	2	L2
	OR		
14	What is a circular queue? Explain the procedure for insert and delete operations. [10]	2	L2
15	Write in order, preorder, post order, level order traversals of the following tree with procedure. [10]	3	L2

			
	OR		
16	Explain the operation of Max heap with an example. [10]	3	L2
17	a) Differentiate linear search algorithm with binary search algorithm. [5] b) Explain quick sort algorithm and simulate it for the following data. [5] {5,3,8,1,4,6,2,7}	4	L2
	OR		
18	a) Explain about collision resolution methods in hashing. [5] b) State and explain insertion sort with an example. [5]	4	L2
19	a) Define binary search tree. Construct the binary search Tree for the below given data. P, F ,B, H, G , S, R, Y, T, W, Z [5] b) Explain and construct AVL Tree with an example. [5]	5	L2
	OR		
20	Illustrate DFS and BFS traversal of following graph. [10] 	5	L2