



**B.Tech III Semester Supplementary Examinations, December 2024**

**DATA STRUCTURES**

(Common to CSE & IT)

Maximum Marks: 70

Date: 04.12.2024

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.

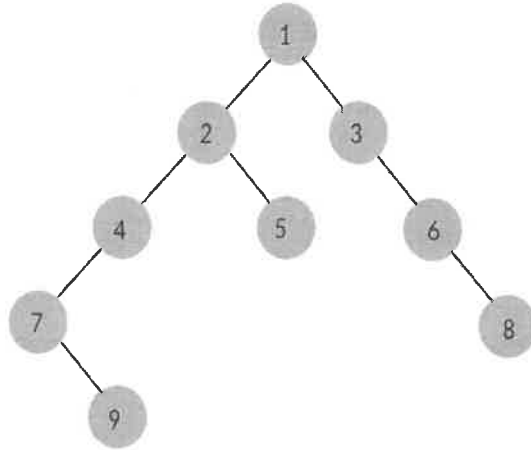
**Part-A**

All the following questions carry equal marks (10X2M=20) Marks		CO	Bloom Tx
1	What is the basic structure of a C++ program?	1	L1
2	What is friend function?	1	L1
3	List the basic operations carried out in a Linked list.	2	L1
4	Define Queue.	2	L1
5	List the properties of a Binary Tree.	3	L1
6	Define a right-skewed binary tree and left-skewed binary tree.	3	L1
7	List the different types of sorting techniques.	4	L1
8	List the main idea behind Selection sort.	4	L1
9	Define graph.	5	L1
10	List the operations on binary search tree.	5	L1

**Part-B**

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	What is inheritance? Explain various types of inheritance with a sample program. [10M]	1	L2
OR			
12	A) Explain the performance analysis of the algorithm? [5M] B) Discuss function template and class template. [5M]	1	L2
13	A) How to evaluate postfix expressions? Explain. [5M] B) List the applications of stack? [5M]	2	L2
OR			
14	What is a singly linked list? How to represent it? Discuss. [10M]	2	L2
15	A) What is a priority queue? Explain its applications. [5M] B) Define max heap. Construct a max heap for the following: [5M] {12, 15, 9, 8, 10, 18, 7, 20, 25}	3	L2
OR			
16	A) What are the various operations that can be performed on a binary tree? Explain. [5M]	3	L2

B) Compose inorder, preorder, postorder traversal of the following tree.  
[5M]



17	Explain quick sort algorithm and simulate it for the following data 20, 35, 10, 16, 54, 21, 25. [10M]	4	L2
	OR		
18	State and explain merge sort with an example. [10M]	4	L2
19	Explain the insertion, searching operation on B- trees. [10M]	5	L2
	OR		
20	Explain BFS graphs traversal algorithms with suitable example. [10M]	5	L2