SE ECS | Sem II | R-19 | SH24 date- 14/12/2

G.P 66510

Paper / Subject Code: 51124 / Data Structures & Algorithm

Duration: 3hrs **[Max Marks:80]**

N.B.: (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1 Attempt any FOUR [20]

a Compare Static and Dynamic Array with their declaration. [5]

b Enlist and explain Queue operations. [5]

c Define the term Node, Address, Null pointer, Next and Empty list for linked list. [5]

d Explain the types of Binary Tree. [5]

e Compare Internal and External Sorting. [5]

2 a Explain in detail characteristics of algorithms with time and space complexity. [10]

b Write a program in 'C' to convert infix expression into postfix form. [10]

3 a Write a C Program to Implement Singly Linked List ADT. [10]

b Explain the preorder and postorder traversal methods. Consider the following in-order and preorder traversal tree. Construct Post-order traversal tree and draw binary tree. [10]

In-order	D	G	B	A	H	E	I	C	F
Preorder	A	B	D	G	C	E	H	I	F

4 a Demonstrate the algorithm for Binary Search with the following example. 63, 82, 94, 77, 53, 87, 23, 55, 10, 44. key = 44. [10]

b Write short note on BFA and DFS algorithm. [10]

5 a Given the following processes with their respective burst times and a time quantum of 3 ms, compute the **completion time, turnaround time**, and **waiting time** for each process using the Round Robin scheduling algorithm. Also, draw the Gantt chart for the scheduling. [10]

Process	Burst Time (ms)
P1	5
P2	7
P3	3

b Write a C program to implement a queue using arrays. Write a function for Enqueue, Dequeue and Display. [10]

6 a Construct the Huffman Tree and determine code for each symbol in word "MALAYALAM". [10]

b Hash the following data in a table of size 10 using linear probing and quadratic probing. Also find the number of collisions. [10]
12, 45, 67, 88, 27, 78, 20, 62, 36, 55.

****

10