

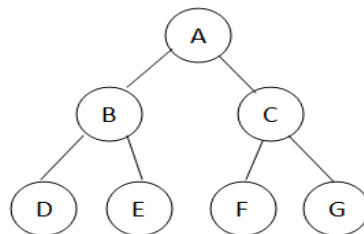
Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER B.TECH DEGREE EXAMINATION (S), FEBRUARY 2023**COMPUTER SCIENCE AND ENGINEERING****(2020 SCHEME)****Course Code : 20CST201****Course Name: Data Structures****Max. Marks : 100****Duration: 3 Hours****PART A****(Answer all questions. Each question carries 3 marks)**

1. What is frequency count? Compute the frequency count of the following code fragment
int a=0;
for(i=0;i<N;i++)
 for(j=N;J>I;j++)
 a=a+i+j;
2. Describe the Big O notation with an example.
3. Write any three applications of stack.
4. Convert the given infix expression to prefix expression
(A+B) *C-(D-E)*(F+G)
5. What are the merits and demerits of doubly linked lists?
6. Write an algorithm to delete the last node from a circular singly linked list.
7. Differentiate between complete binary tree and full binary tree. Give examples for each.
8. Write the output of inorder, preorder and postorder traversals on the following tree



9. Write the algorithm for selection sort.
10. What is hashing? List any two applications of hashing.

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) Explain the System Life cycle in detail. (6)
b) Explain best case, worst case and average case analysis of an algorithm with an example. (8)

OR

12. a) Explain asymptotic notations with example. (7)
b) What is time and space complexity? Derive the Big O notation for $f(n)=3n^3 + 2n + 7$. (7)

MODULE II

13. a) Write an algorithm to add two polynomials using arrays. (7)
b) Write an algorithm for searching an element using Binary search. (7)

OR

14. a) Write an algorithm for searching an element using Linear search. (7)
b) Write an algorithm for converting infix expression to postfix. Trace the algorithm to convert the expression $(A+B) * (C-D) +E$. (7)

MODULE III

15. a) Write an algorithm for insertion of a node in a doubly linked list at the
i) beginning of the list (7)
ii)middle of the list.
b) How do First fit, Best fit and worst fit memory allocation algorithms work? Explain with an example. (7)

OR

16. a) Write an algorithm to delete a node from a circular linked list. (7)
b) Write an algorithm to implement a queue using linked list. (7)

MODULE IV

17. a) Describe a Binary Search Tree. Show the steps in creating a binary search tree with the following values 9,2,11,1,5,13,6. (7)
b) Write an algorithm to perform breadth first search (BFS) of a graph. (7)

OR

18. a) Describe any two graph representation methods with examples. (7)
b) Write an algorithm for preorder,inorder and postorder traversals in a binary search tree. (7)

MODULE V

19. a) Explain the quick sort algorithm with a example. (7)
b) What is hashing? Explain any two hash functions with example. (7)

OR

20. a) Write an algorithm to implement merge sort with an example. (7)
b) Explain the different collision resolution methods in Hashing. (7)
