

B.E. Electrical (Electronics & Power) Engineering (MODEL CURRICULUM) Sem-VI
TE203A : Data Structures and Algorithms

P. Pages : 2

Time : Three Hours



GUG/W/22/13875

Max. Marks : 80

- Notes : 1. Assume suitable data wherever necessary.
2. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) What is algorithm? Explain the different characteristics of algorithm. Also explain time space trade off? **8**

b) Write a program for inserting the element in the starting and ending of array. **8**

OR

2. a) What is binary search? Write a 'C' program for binary search and explain with an example. **8**

b) Write short note on Asymptotic notations. **8**

3. a) What is linked list? Explain singly and doubly linked list with suitable example. **8**

b) Write a C-program for singly linked list. **8**

OR

4. a) Write a C-program to count number of nodes in a singly linked list? **8**

b) Write a C-program to implement circular linked list? **8**

5. a) What is stack? Explain push and Pop operation in stack write application of stack. **8**

b) Convert the following infix expression to prefix and postfix. **8**

i) $((A + B - D) / (E - F) + G)$

ii) $(A \uparrow B \uparrow C) / (D \uparrow E * (G \uparrow F))$

OR

6. a) What is Queue? Explain circular queue with example. **8**

b) Write a menu driven program in C- to implement the following functions of queue? **8**

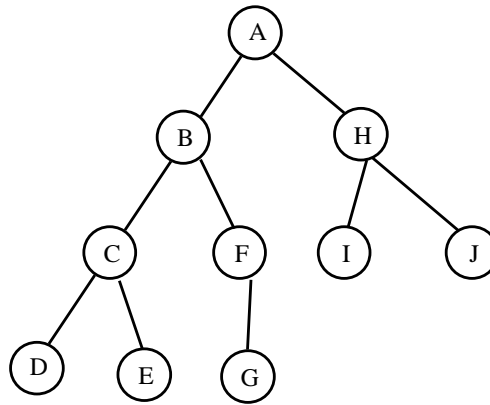
i) Enqueue

ii) Display

iii) Dequeue

iv) Exit

7. a) Write preorder, inorder and postorder for the following tree? 6



- b) Explain following tree terminologies- 2
 i) Strictly Binary tree ii) Height of tree
 c) Write a C-program for tree traversal method of binary search tree. 8

OR

8. a) What is binary search tree? Write a function for insert, delete and search operation in BST. 8
 b) Write a short note on AVL tree? Explain types of rotations with the help of suitable example. 8
9. a) What is Quick Sort? Sort the following array using quick sort. 65, 70, 75, 80, 85, 60, 55, 50, 45 Also write the algorithm. 8
 b) Explain bubble sort algorithm with suitable example? 8

OR

10. a) What is Hashing? Solve given example by using division method with linear probing? 8
 3, 2, 9, 6, 11, 13, 9, 12 $m = 10$ and $h(k) = 2k+3$.
 b) Explain graph traversal techniques with suitable example? 8
