

B.E. Electrical (Electronics & Power) Engineering (Model Curriculum) Semester-VI
TE203A - Data Structures and Algorithms

P. Pages : 2

Time : Three Hours



GUG/W/23/13875

Max. Marks : 80

Notes : 1. All questions are compulsory.

1. a) Write a function of binary search and linear search technique. Also explain its best case and worst case complexity? **8**

b) What is algorithm? Explain characteristics of algorithm and time-space trade off. **8**

OR

2. a) Write a C-program to count even number of elements from the matrix of 3×3 size. **8**

b) Define Data structure and explain its types by giving example? **8**

3. a) Write a program to count number of nodes in a doubly linked list? **8**

b) Write advantages and disadvantages of circular linked list? **8**

OR

4. a) Write a C-program to reverse a singly linked list? **8**

b) Explain Generalized list with example? **8**

5. a) Convert the following infix to postfix expression. **8**

i) $(A + B) - C + D * (E / F \uparrow G)$

ii) $[(x + y) * z] \uparrow [(a - b) / c + e]$

iii) $(A + B) / [C - D * (F - a)] + G$

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

b) Queue is called first in first out (FIFO) type of list justify. **4**

c) Explain push and pop operation for stack? **4**

OR

6. a) Differentiate between stack and queue. **8**

b) Write a menu driven program in C to implement the following funⁿ of queue. **8**

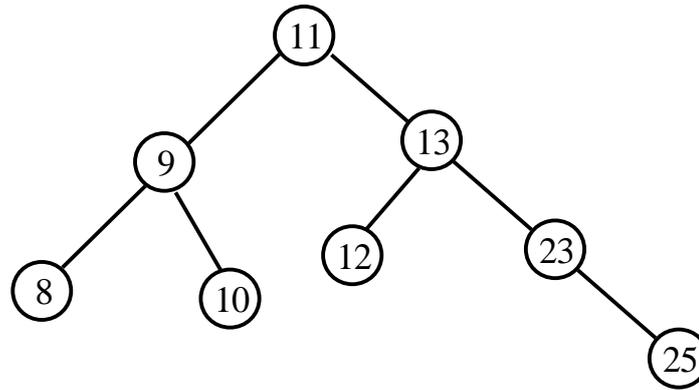
i) Enqueue

ii) Dequeue

iii) Display

iv) Exit

7. a) Explain and write tree traversal functions of binary search tree. Write inorder, preorder, postorder sequence for the following. 8



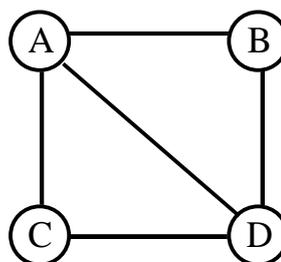
- b) Explain the following term. 8
- i) Tree
 - ii) Degree
 - iii) Root node
 - iv) Leaf node
 - v) Successor node
 - vi) Level of tree
 - vii) Complete binary tree
 - viii) Forest

OR

8. a) What is binary search tree. Write a C function for binary search tree operation. 8
- b) Write a note on threaded binary tree. 4
- c) Difference between terminal node and non-terminal node. 4
9. a) Write a program to implement bubble sort? 8
- b) Explain traversal algorithm for graph data structure. 8

OR

10. a) What is Graph? Represent following graph with its adjacency matrix, list, and multi-list method. 8



- b) Sort the following sequence using Quick sort. 8
- 10, 9, 3, 4, 6, 2, 1, 12, 14
