

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

P. Pages : 2

Time : Three Hours



GUG/W/24/13875

Max. Marks : 80

- Notes :
1. All questions are compulsory.
 2. All questions carry equal marks.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.

1. a) Write a C program to implement binary search algorithm. 8
- b) Write algorithm for bubble sort and perform bubble sort on below array: 8
 $A = \{7, 2, 9, 6, 4, 1\}$. State number of passes required and complexity for above example.

OR

2. a) Define data structure. State and explain different types of data structures in detail. 8
- b) Explain arrays and sparse matrices in detail. Write a C program to input 10 elements and display them using arrays. 8
3. a) What is circular linked list? Explain the need of circular linked list and its types. 8
- b) Write a C program to implement doubly linked list. 8

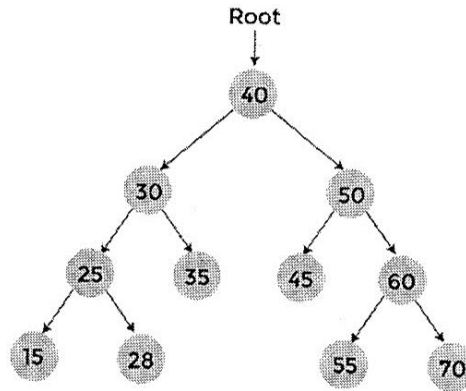
OR

4. Write algorithm for circular linked list for the following operations. 16
i) Insertion at the beginning of the list.
ii) Insertion in between.
iii) Deletion at the end of the list.
5. Explain double ended queue and write algorithms for following operations: 16
i) insert at front. ii) delete from front.
iii) insert at rear. iv) delete from rear.

OR

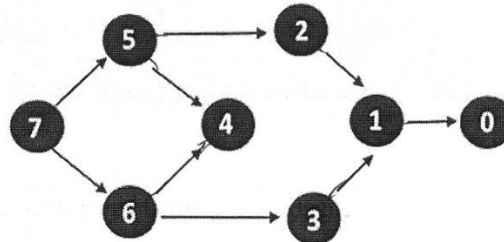
6. a) What is stack? Illustrate stack representation in memory and explain basic Operations on stack with example. 8
- b) Convert the following from infix to prefix using stack: 8
i) $(A + B) * C / D + E^F / G$
ii) $(A + B - D) / (E - F) + G$

7. Write inorder and preorder traversal algorithm and give inorder and preorder traversal for the following graph: 16

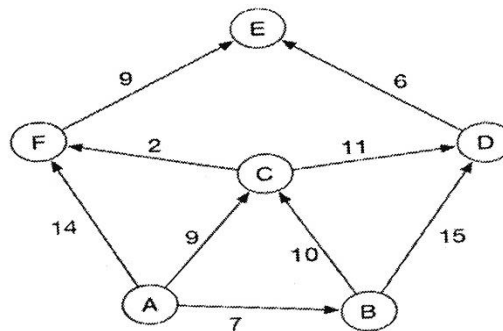


OR

8. a) What is Binary search tree. Show how to create BST step by step for following data: 8
 45, 15, 79, 90, 10, 55, 12, 20, 50
- b) Explain threaded binary tree in detail. 8
9. a) Explain topological ordering of graph and show ordering for following graph: 8



- b) Find the shortest path from node to all other nodes by using Dijkstra algorithm for following graph: 8



OR

10. a) What is graph and explain the following terms with example: 8
 - directed and undirected graph
 - linked list graph representation.
- b) Write BFS algorithm and perform BFS for following graph: 8

