SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
B.Sc.(CS) END SEMESTER EXAMINATIONS APRIL-2023
SEMESTER - III
**21UCSCT3004 - Data Structures and Algorithms**

Total Duration : 2 Hrs 30 Mins.                                   Total Marks  : 60
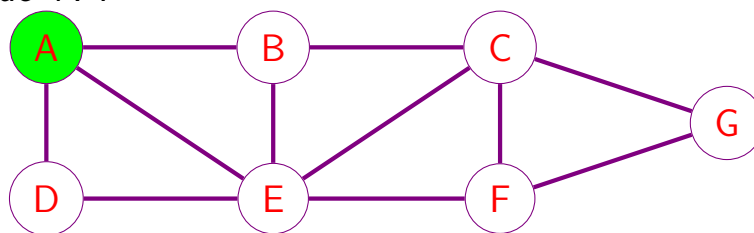
## Section B

Answer any **SIX** questions  $(6 \times 5 = 30$ Marks)

1. What is recursion? Explain the factorial function using recursion.

2. Define stack. Write the algorithm for push and pop using arrays.

3. With a neat diagram explain the process of a Circular linked list.

4. Create a binary search tree for the following elements
        50,15,75,81,77,30,64,99,18,3,35

5. Differentiate Maps and Dictionaries.

6. What is a hash table?Explain how Hash Tables are implemented.

7. Define algorithm. How you measure the efficiency of an algorithm?

8. Write and apply the selection sort algorithm for the given elements and determine the complexity.
        14,33,27,10,35,19,42,44

## Section C

Answer any **THREE** questions  $(3 \times 10 = 30$ Marks)

9. Define Data Structure? Classify the types of data structures with example.

10. Build an algorithm for inserting a node at different positions in a
     singly linked list.

11. Write the algorithm for deletion of a node in a binary search tree.

12. Explain the two graph traversal technique and apply for the given graph, starting from node 'A '.



13. Construct an algorithm for merge sort and sort the following elements.
        38, 27, 43, 3, 9, 82, 10

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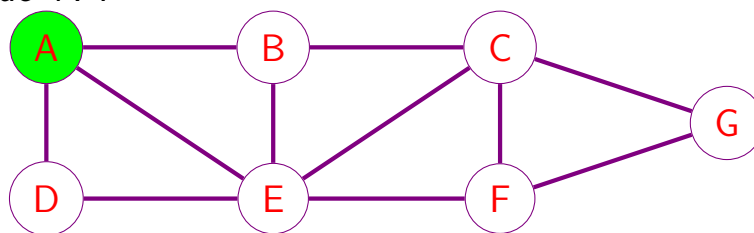
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