QP CODE: 25021712

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Reg No : .....

Name : .....

B.VOC DEGREE REGULAR/REAPPEARANCE EXAMINATIONS, MARCH 2025

Sixth Semester

B.Voc Software Quality Assurance and Quality Control

SQACG602 - DESIGN AND ANALYSIS OF ALGORITHMS

2018 Admission Onwards

D71CD0BC

Time: 3 Hours Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. List two characteristics of an algorithm.
2. Does a greedy algorithm always guarantee the optimal solution?
3. Name three asymptotic notations used to represent time complexity.
4. How many steps does an assignment statement count as in time complexity?
5. What is the role of a pivot element in Quicksort?
6. What is the simple problem that can be solved by the divide-and-conquer technique?
7. What is the time complexity of Merge Sort in asymptotic notation?
8. What is the purpose of the subroutine Partition?
9. What happens when rightmark becomes less than leftmark in the Partition process?
10. Give one disadvantage of greedy algorithms.
11. What is average-case analysis of an algorithm?
12. Define Little oh notation.

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Explain the backtracking algorithm design technique.

14. Describe randomized algorithms.

15. Explain Big-Omega notation with an example.

16. Describe the role of randomized algorithms in problem-solving.

17. Discuss the Little Oh notation and its significance.

18. Explain performance analysis and the factors influencing it.

19. Explain the control abstraction for divide and conquer.

20. Explain the Merge Sort algorithm with an example.

21. Write the algorithm for the greedy method.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Discuss the Divide and Conquer paradigm in detail, explaining its general method, control abstraction, and applications in various algorithms like Binary Search, Merge Sort, and Quicksort.

23. Explain the greedy method in detail, discussing its general method, advantages, disadvantages, and applications, including the Knapsack Problem.

24. Discuss minimum cost spanning trees, including Prim's and Kruskal's algorithms, and provide a detailed comparison of these two algorithms.

25. Describe and differentiate between the various asymptotic notations (Big-O, Big-Omega, Theta, Little Oh, and Little Omega), providing examples and explaining their use in analyzing algorithm efficiency.

(2×15=30)