

2025

5th Semester Examination (CCFUP : NEP)

COMPUTER SCIENCE

Paper : MJ 8-T (Single Core Major)

[Design and Analysis of Algorithm]

Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.  
Candidates are required to give their answers  
in their own words as far as practicable.*

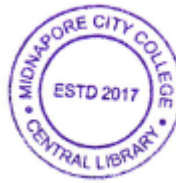
**Group - A**

Answer any *five* questions :  $2 \times 5 = 10$

1. Define Algorithm and write down any two characteristics of a good algorithm.
2. Define Big-Omega ( $\Omega$ ) notation with an example.
3. What is time complexity of linear search and binary search?
4. Differentiate iterative method and recursive method.
5. Define Greedy algorithm.
6. How is a graph is represented using adjacency matrix?

P.T.O.





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7. What is the difference between Divide and Conquer and Dynamic programming?
8. What data structure is used in DFS and why?

**Group - B**

Answer any *four* questions :  $5 \times 4 = 20$

9. Solve the recurrence relation by substitution method :  
 $T(n) = 2 T(n/2) + n$ .
- ~~10.~~ Explain Merge Sort algorithm with its time complexity.
- ~~11.~~ Explain Activity Selection Problem using Greedy Programming.
- ~~12.~~ When the worst case occurs in a normal Quick Sort algorithm? How it can be avoided?  $4+1$
- ~~13.~~ Briefly explain Binary Search using divide and conquer approach.
14. Discuss knapsack problem using the concept of Greedy Technique.

**Group - C**

Answer any *one* question :  $10 \times 1 = 10$

- ~~15.~~ Discuss Graph Traversal algorithms (BFS and DFS) with algorithm and complexity.
  16. Explain how coin changing problem is solved using greedy approach. State how Tower of Hanoi problem is solved using recursion.  $5+5$
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