

FACULTY OF ENGINEERING**B.E. (IT) VI- Semester (AICTE) (Backlog) (New) Examinations, February/ March 2024****Subject : Design & Analysis of Algorithms****Time: 3 Hours****Max. Marks: 70**

- Note:** (i) First question is compulsory and answer any four questions from the remaining six questions. Each question carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. a) What is Algorithm specification?
b) State the weighting, collapsing rules in sets.
c) What is feasible solution?
d) What are dominance rules in 0/1 knapsack problem?
e) Define satisfiable problem.
f) Explain 8 queens' problem.
g) What is multistage graph?
2. a) What is Asymptotic notation explain in detail?
b) Explain Union and Find representations of set.
3. a) Explain how merge sort uses divide and conquer method.
b) Sort the following keys using merge sort (10,30,15,45,25,35,20,40,50).
4. a) Describe the 0/1 knapsack problem.
b) Solve the following knapsack instance $n=4, (w_1, w_2, w_3, w_4) (P_1, P_2, P_3, P_4) = (2, 5, 8, 1)$ and $M=21$ using dynamic programming.
5. a) What is backtracking. Discuss merits and demerits?
b) Write an algorithm for 8 Queens's problem using back tracking.
6. a) State and prove Cook's Theorem.
b) Write short notes on NP -Hard graph problems.
7. a) Give short notes on Biconnected components.
b) Differentiate dynamic programing with greedy method.