Oct/Nov - 2025

Total No. of Questions : 5] SEAT No. :

PE-4210 [Total No. of Pages : 2

[6554]-3002

M.C.A. (Management)

DAA602MJ : DESIGN AND ANALYSIS OF ALGORITHMS

(2024 Pattern) (Semester - III)

Dr. D. Y. Patil Institute of Management & Entrepreneurship Development LIBRARY

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Each question has an internal choice.*
3) *Assume any suitable data if necessary.*
4) *Use of non programmable calculator is allowed.*

Q1) Answer any two questions :

a) What are Asymptotic notations? Explain Big O, Omega and Theta notations with suitable mathematical and graphical representations. **[5]**

b) Differentiate between divide & conquer strategy and Greedy method. **[5]**

c) Explain KMP algorithm with an example. **[5]**

Q2) a) Write an algorithm for Randomized Quicksort. **[5]**

b) Apply Min Max algorithm to find both minimum & maximum element in the given array.

[22, 13, –5, –8, 15, 60, 17, 31]

Show recursive division & calculate comparison. **[5]**

OR

c) Solve the given recurrence relation using Master's theorem. **[10]**

i) $T(n) = 2T(n/2)+n$ ii) $T(n) = 9T(n/3)+n^2$

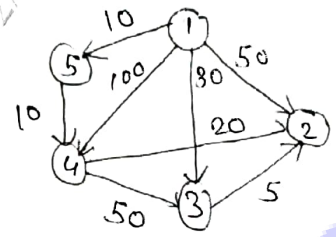
P.T.O.

Q3) a) Find an optimal solution for the given Knapsack problem instance $n = 4$ objects and the capacity of Knapsack $m = 15$, profits = (10, 5, 7, 11) and weight = (3, 4, 3, 5). **[5]**

b) Find an optimal binary merge pattern to merge files whose lengths are 20, 30, 10, 5, 30. **[5]**

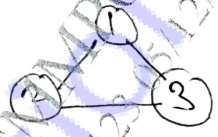
OR

c) Apply Dijkstra's algorithm to find the length of shortest paths from source vertex 1 to all remaining vertices in the given digraph. **[10]**



Q4) a) Given 2 strings X = "STONE" and Y = "LONGEST" find the LCS using Dynamic programming. **[5]**

b) Draw a state space tree for the given graph with nodes (n) = 3 and colors (m) = 3 using graph coloring algorithm. **[5]**



OR

c) Explain the Backtracking approach used in solving the subset sum problem. **[10]**

Q5) Answer any two questions :

a) Explain Deterministic and Non-Deterministic algorithm. **[5]**

b) Write short note on Approximation algorithm. **[5]**

c) Explain Genetic Algorithm (GA) with suitable example. **[5]**

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