

**Code No: MC1635/R16**

**MCA III Semester Supplementary Examinations, Feb/Mar-2022**

**DESIGN AND ANALYSIS OF ALGORITHMS**

**Time: 3 Hours**

**Max. Marks: 60**

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*Answer Any FIVE Questions  
All Questions Carry Equal Marks*

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1. a Discuss orders of growth and worst case, best case and average case efficiencies. 6M  
b Write an algorithm to find largest of given 'n' numbers, derive its time complexity using big 'Oh' notation. 6M
2. a Explain pseudo code for expressing algorithms. 6M  
b Discuss Amortized analysis of algorithms with example. 6M
3. a Sort the given data 22,45 ,67,17,05,19,8,37,83 using quick sort and analyze its time complexity? 6M  
b Explain prim's algorithm to find minimal spanning tree with suitable example and analyze its time complexity. 6M
4. a Explain greedy knapsack for 6M  
 $n=3, m=40, (p_1, p_2, p_3)=(40, 25, 10), (w_1, w_2, w_3)=(16, 12, 7)$   
b Explain the Single source shortest path problem with an example. 6M
5. a Explain multistage graph problem using dynamic programming with suitable example. 6M  
b Explain how to increase the reliability of a system using dynamic programming with example. 6M
6. a Explain general method of backtracking. 6M  
b Write an algorithm to determine the Hamiltonian cycle of a graph using backtracking. 6M
7. a Explain how branch and bound technique is used to solve 0/1 knapsack problem. 6M  
b Explain non deterministic algorithms for sorting and searching. 6M
8. a Define branch and bound and write control abstraction for LC-Search. 4M  
b Solve travelling sales person problem using branch and bound 8M

$\infty$	20	30	10	11
15	$\infty$	16	4	2
3	5	$\infty$	2	4
19	6	18	$\infty$	3
16	4	7	16	$\infty$

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