Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER MCA (Second Year Direct) DEGREE EXAMINATION, DECEMBER 2018

Course Code: RLMCA 207

Course Name: DESIGN AND ANALYSIS OF ALGORITHMS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks Marks

1	Differentiate Time and space complexity.	(3)
2	Discuss the control abstraction of Divide and Conquer Approach.	(3)
3	Explain the control abstraction of Greedy Approach.	(3)
4	State the principle of optimal substructure with example.	(3)
5	Define Live node, Dead node and E-node in branch & bound techniques.	(3)
6	Apply backtracking technique for solve the following instance of Subset sum problem w={3,4,5,6) and d=9	(3)
7	Discuss the control abstraction of Branch and Bound Technique.	(3)
8	Differentiate Tractable and Intractable problem.	(3)

PART B

Answer six questions, one full question from each module and carries 6 marks.

Module I

9	Explain asymptotic notations and its properties with a suitable example.	(6)

OR

10	Solve the recurrence relations given below using Masters theorem. 1. $T(n)=T(n/2)+n^2$ 2. $T(n)=2T(n/2)+n/\log n$	(6)

Module II

11	Write the algorithm for Quick Sort and sort the elements 50, 30, 80,5,90 using it.	(6)

OR

12	Discuss recursive algorithm and derive the time complexity to determine the maximum and minimum for the following set of numbers. 44, 13, 6, 7, 20, 60, 18, 35, 79.	(6)

Module III

13	Explain Kruskals Algorithm for MST with an example.	(6)

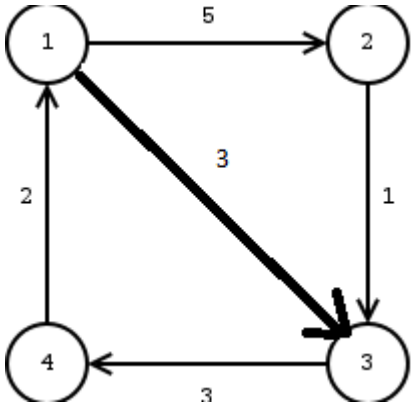
OR

14 Solve Job sequencing problem in greedy approach (6)

Job	J1	J2	J3	J4	J5
Deadline	2	1	3	2	1
Profit	60	100	20	40	20

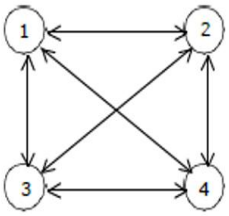
Module IV

15 Find out shortest path from 1 to 4 using All-Pairs shortest path for the graph below. (6)



OR

16 Solve TSP for the graph given below. (6)



The cost adjacency matrix = $\begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{bmatrix}$

Module V

17 Explain N Queens problem and discuss the solution based on back tracking algorithm. (6)

OR

18 Explain N^2-1 problem in detail. (6)

Module VI

19 Compare NP Hard and NP Complete problems. (6)

OR

20 Prove that Vertex Cover problem is NP Complete. (6)

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