Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: IT202

Course Name: ALGORITHM ANALYSIS AND DESIGN (IT)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks Marks

1 a) Solve the recurrence equation using iteration method (7)

b) Explain the Divide and Conquer strategy in Strassen's Matrix multiplication (8)

2 a) What is amortised analysis. Explain any one method to perform amortised analysis with an example. (7)

b) Write an algorithm for performing quick sort and analyse its complexity. (8)

3 a) Explain why worst case complexity of Quick sort is $O(n^2)$ and average case complexity is O(n log n) (7)

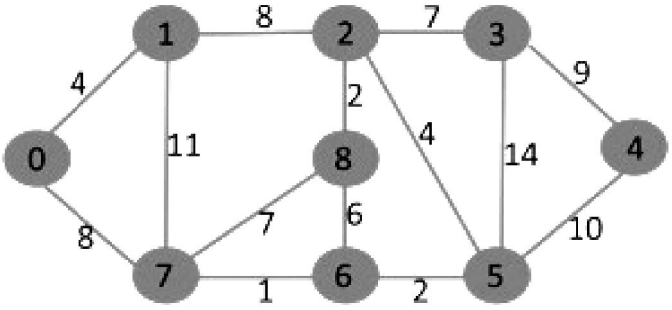
b) Write the recurrence equation for your algorithm and solve it to estimate the time complexity of the algorithm. (8)

PART B

Answer any two questions, each carries 15 marks

4 a) Define the following tree organization for representing solution spaces. (8)
i) Problem state ii) State space iii) Solution state iv) Answer states

b) Write Kruskal's algorithm and Show each stage of executing Kruskal'salgorithm in the following algorithm. (7)



5 a) Differentiate between static state space trees and dynamic state space trees. (8)

b) Why Kruskal's minimum cost spanning tree construction method is considered as Greedy method for problem solving. (7)

6 a) Explain FIFO branch and bound problem for 4-Queens problem. (8)

b) Write and algorithm for Prim's Minimum Spanning Tree and derive its complexity. (7)

PART C

Answer any two questions, each carries 20 marks

7 a) Write algorithm for all pair shortest path and compute its time complexity. (7)

b) Show with an example the method of reducing the time complexity with randomized algorithm. (5)

	c)	Explain how Oracles and adversary arguments are used in estimating the lower bounds of an algorithm.	(8)
8	a)	Explain approximation algorithm with an example.	(7)
	b)	Write the Las Vegas randomized algorithm for quick sort.	(7)
	c)	Show how Dynamic programming can solve the problem for a given instance by taking an example.	(6)
9	a)	Estimate the lower bound of insertion sort from the comparison tree.	(8)
	b)	Write the recursive equation for 0/1 knapsack problem based on the principles of optimality.	(8)
	c)	Give an approximate algorithm for graph colouring.	(4)

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