


National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Design and Analysis of Algorithms	Course Code:	CS302
	Degree Program:	BS(CS)	Semester:	Spring 2020
	Duration:	20 Minutes	Total Marks:	4+3+3
	Date:	Feb 21, 2020	Weight	2.5
	Section:	6C	Page(s):	1
	Exam Type:	Quiz		

Student : Name: _____ **Roll No.** _____
Section: _____

Instruction/ Attempt the quiz on this sheet and write concise answers.

Notes: _____

Q1) You are given a 2D sorted array (elements are in ascending order in each row and column) of size $N \times N$. Your task is to devise a *linear time* algorithm to find an element x in the 2D array.

Q2) Assume that $T(1)=1, T(2)=1$, and $T(n)=T(n-2)+n$ for $k \geq 3$. What is $T(n)$ in terms of big O notation?

Q3) Justify your answer whether the following recurrences can be solved using Master theorem. **Note:** Show your working on the other side of the page.

1. $T(n) = 3T\left(\frac{n}{3}\right) + n \lg n$

2. $T(n) = 2T\left(\frac{n}{4}\right) + \sqrt{n}$

3. $T(n) = T(n-2) + n^2$

