National University

of Computer & Emerging Sciences Peshawar Campus

Student Name: _____ Section: _____ Roll No: _____

Program: CS20 A & B
Semester: Spring – 2021 ***[Covid19 Online Exam]***
Time Allowed: 1 hour + 40 Minutes
Course: **Design & Analysis of Algorithms**

Examination: Sessional – I & II
Total Marks: 50 Weightage: 20 %
Date: 28th May, 2021
Instructor: Mr. Fazl-e-Basit

NOTE: Attempt all questions. ***NO ANSWER SHEET REQUIRED***

Time: 20 Minutes **Marks: 9**

Q.5) Give asymptotic **upper** and **lower** bounds for the recurrence $\mathbf{T(n) = \Theta(\log(n).\, n^2) + T(n-2).}$ Assume that T(n) is constant for $n \leq 1$. Make your bounds as tight as possible, and justify your answers. **[2.5 + 2.5]**

Q.6) Find out the running time of the following recurrence relation. You can use recurrence tree, substitution method or Master's Theorem to provide appropriate asymptotic bounds. **[4]**

$\mathbf{T(n) = T(9n/10) + n^2.\sqrt{n}}$ (√**n** : Means Under Root n)