HABIB UNIVERSITY

Data Structures & Algorithms

CS/CE 102/171 Spring 2023

Instructor: Maria Samad

Time Complexity of Recursive Functions – Recursion Tree Method

Student Name: _____

Q1) For the given recurrence equation, derive its time complexity, by using the Recursion Tree Method. Make sure you show the pattern before solving it for the final equation.

$$T(n) = \begin{cases} T(n-1) + n^2 & , n > 0 \\ 1 & , n = 0 \end{cases}$$

Q2) For the given recurrence equation, derive its time complexity, by using the Recursion Tree Method. Make sure you show the pattern before solving it for the final equation.

$$T(n) = \begin{cases} T(n-4) + n & ,n > 0 \\ 1 & ,n = 0 \end{cases}$$

Q3) For the given recurrence equation, derive its time complexity, by using the Recursion Tree Method. Make sure you show the pattern before solving it for the final equation.

$$T(n) = \begin{cases} 3T(n-1) + 5 & ,n > 0 \\ 1 & ,n = 0 \end{cases}$$

Q4) For the given recurrence equation, derive its time complexity, by using the Recursion Tree Method. Make sure you show the pattern before solving it for the final equation.

$$T(n) = \begin{cases} 3T(n-4) + 1 & ,n > 0 \\ 1 & ,n = 0 \end{cases}$$

Q5) For the given recurrence equation, derive its time complexity, by using the Recursion Tree Method. Make sure you show the pattern before solving it for the final equation.

$$T(n) = \begin{cases} T(n/3) + 7 & ,n > 1 \\ 1 & ,n = 1 \end{cases}$$

Q6) For the given recurrence equation, derive its time complexity, by using the Recursion Tree Method. Make sure you show the pattern before solving it for the final equation.

$$T(n) = \begin{cases} T(n/2) + n & ,n > 1 \\ 1 & ,n = 1 \end{cases}$$

Q7) For the given recurrence equation, derive its time complexity, by using the Recursion Tree Method. Make sure you show the pattern before solving it for the final equation.

$$T(n) = \begin{cases} 2T(n/2) + n & ,n > 1 \\ 1 & ,n = 1 \end{cases}$$