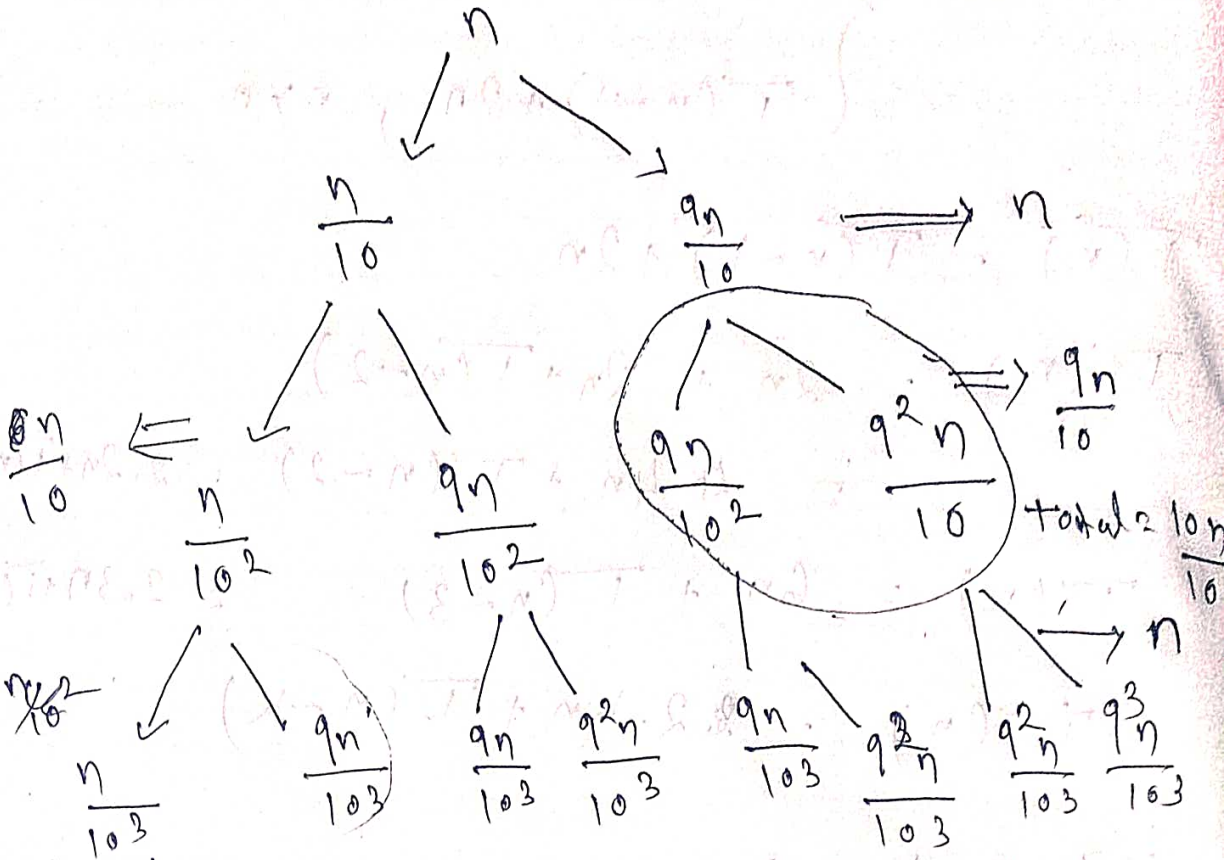
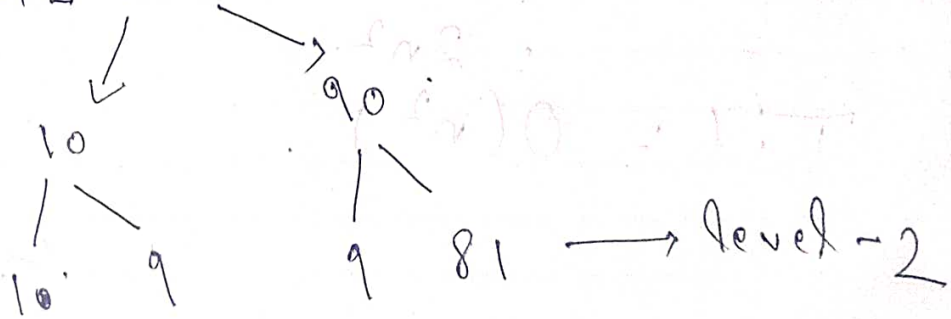
(2) $T(n) : T(n/10) + T(9n/10) + n$



Cont → $\frac{n}{10^2} + \frac{9n}{10^2} + \frac{9n}{10^2} + \frac{9^2 n}{10} = \frac{100n}{10^2}$

$= n$

∴ Take $n = 100$



$\log_{10}(100) = 2.$

$n + n + n + \cdots + n$ ($\log_{10} n$ time)

$= O(n \cdot \log n)$.

(3) $T(n) = T(\sqrt{n}) + \log n$

$a = 1$

$b = 1$

$k = 0$

$p = 1$

$\log_b a = 1 > 0$

Case-1

$T(n) = \Theta(n^{\log_b a})$

$T.C. = \Theta(n)$.