Date / / Hssignment -1 Asymptotic Notatione: Asymptotic notations are used to write fastest and slowert algorithm. Those are also referred to as best case and worst case somerion respectively. In asymptotic notations, we desire the complexity concorning the size of the input. (Example interime of n). These notations are important because the algorithm, we can testimate the complexity of the algorithm. Different notations Big - on notation: Big - on is the formal mothod of expressing the oppose bound of an algorithme etonning time. It is the measure of the longest amount of time. The V function I(n)= 0(g(n)). Eg: 3n + L = O(n) for all $n \ge 1$.

3)
$$T(n) = 93T(n-1)ijn > 0$$
, otherwise 1)
 $T(n) = 3T(n-1) - 0$

Put
$$n = n - 1$$
 in \mathbb{O}

$$T(n-1) = 3T(n-2) - \mathbb{O}$$
Substitute \mathbb{O} in \mathbb{O} :

Put
$$n=n-2$$
 in \bigcirc

$$T(n-2)=3T(n-3)-\cancel{4}$$
Substitute $\cancel{4}$ in $\cancel{3}$:

$$T(n) = 3^{2}d3T(n-3) - 5$$

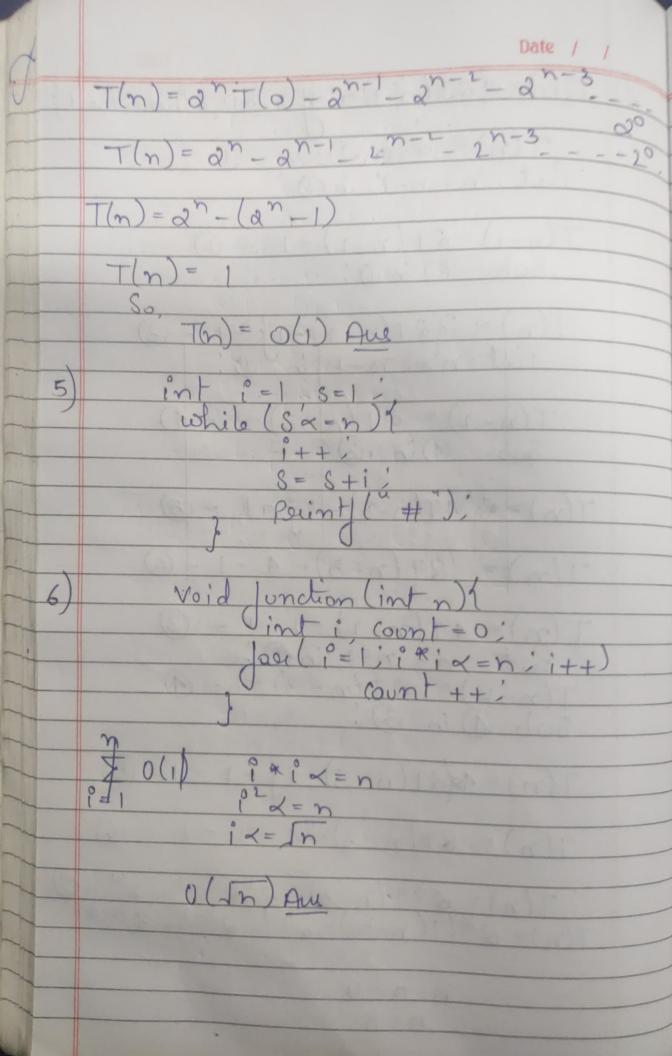
 $T(n) = 3^{3}dT(n-3) - 6$

$$T(n) = \frac{n = k}{3^n \sqrt{T(0)}}$$
So,

$$T(n) = 3^n$$

 $T(n) = 0(3^n)$ Ans

n-K=0



Date / / void Junction (int n) 2

int i j K count = 0;

jour (i = n) i x = n i i + 12 Jace (j=1: jx=h: j=j*2) Jaar (K=1: Kx=n: K=K+2) Count ++ ! 1st Loop! 1: i= n+0 2: 1° = n +1 3: i = n + 2K: 1 = n + (K-1) n + (K-1) = n60, K-1= n-n K-1= n K=n-1 1st Loop: O(n)

Date / / $2^{\text{nd}} \text{ Loop: } 1 : i = 1 = 2^{\circ}$ $2 : i = 2 = 2^{1}$ $3 : i = 4 = 2^{1}$ $4 : i = 8 = 2^{3}$ $K : i = 2^{1}$ K-1 = log n K = log n -1 K = log n and Loop (blog n) Time complexity! n * lgn * lgn

=) O(n(logn)2) Aus void function (int n) Jose (j=lija=nij=j+i) Point (*) 18t 200p: 1:1 to n

