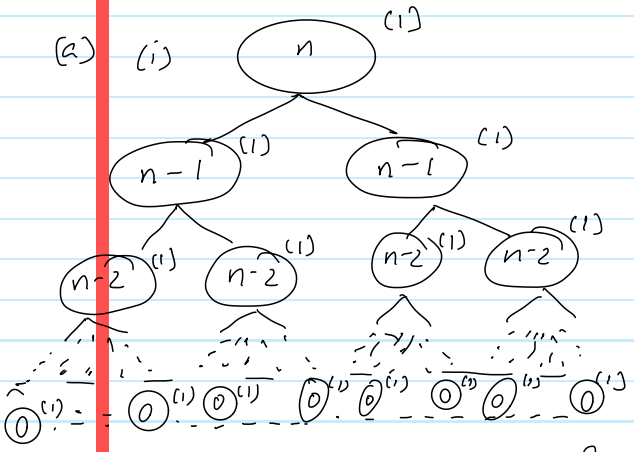
Q2)

(a) (i)

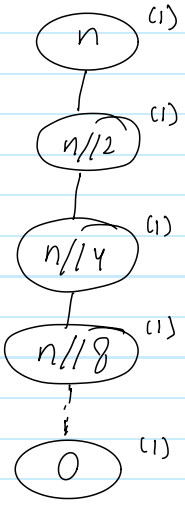


(ii) Total Cost = $1 + 2 + 4 + 8 + \dots + 2^n$

$= 2^{n+1} - 1$

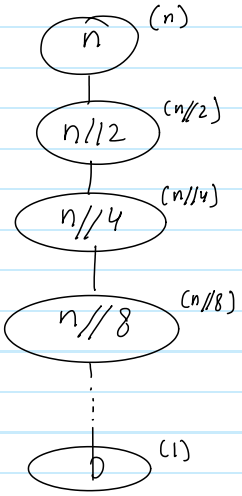
$\therefore O(2^{n+1} - 1) = O(2^n)$

(b) (i)



(ii) Total cost = $O(\log(n))$

(c)



$\therefore$ Total cost = $n + \frac{n}{2} + \frac{n}{4} + \frac{n}{8} + \dots + 1$

$= 2n - 1$

$\therefore O(2n - 1) = \boxed{O(n)}$