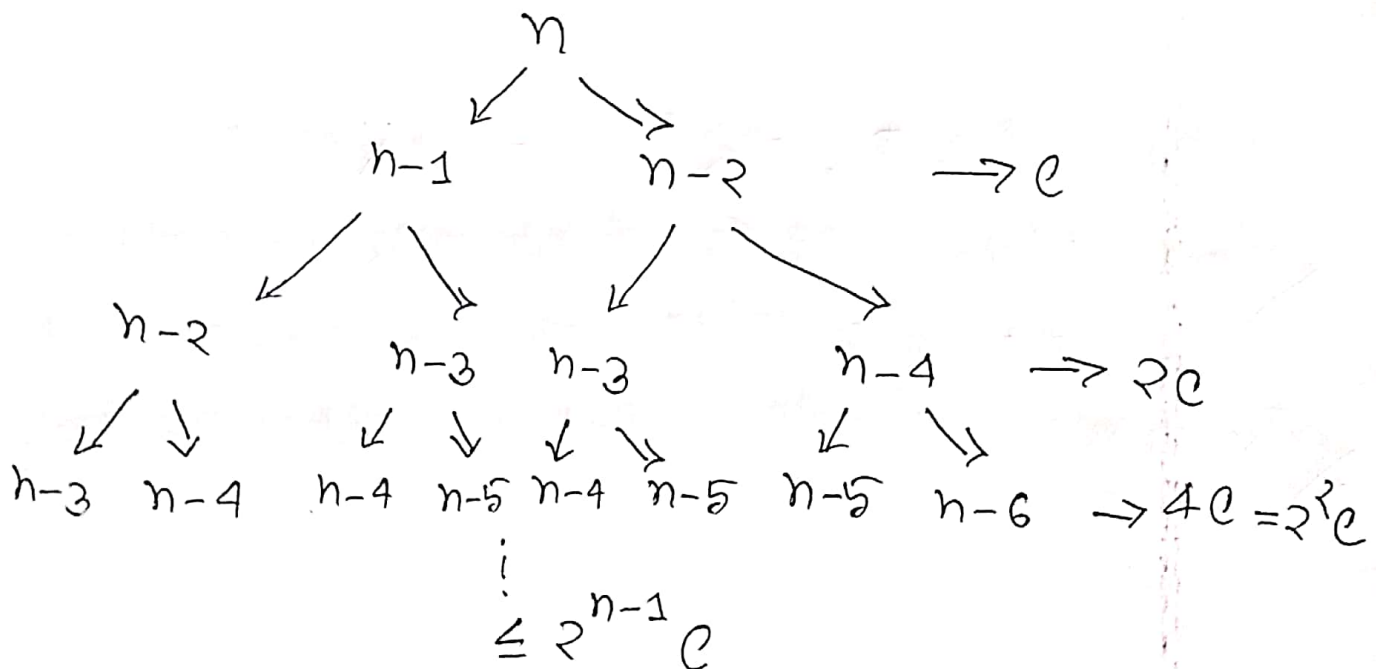Answer to the question no: 02

(a) For implementation 1, we can see it's a recursion.

$$T(n) = T(n-1) + T(n-2) + c$$

$$\leq 2^{n-1} c$$

$$\therefore T(n) \leq 2^n$$

$$\Rightarrow T(n) = O(2^n)$$

$$\therefore \text{Time complexity} = O(2^n)$$

For implementation 2,

There is a for loop in implementation 2.
Since implementation 2 only uses 1 for loop,

∴ Time complexity, $T(n) = O(n)$

So, we can say that, $2^n > n$. The iterative method (implementation 2) is significantly faster. So, implementation 2 is the better method in terms of time complexity.