1.

$$P \doteq N > 0$$
$$Q \doteq \forall_{0 \leqslant k < i}\, a[k] = b[k] \wedge (a[i] \neq b[i] \vee i = N)$$

2.

$$I \doteq i \leqslant N \;\wedge\; 0 < r \leqslant i \;\wedge\; r \cdot C \geqslant \textstyle\sum_{k=0}^{i-1} p[k]$$
$$V \doteq N - i$$

3.

Melhor caso: $\sum_{i=0}^{N-1} p[i] \leqslant C$

$$T_{mc}(N) = \sum_{i=1}^{N-1} 3 = 3(N-1-1+1) = 3(N-1) = 3N-3$$

$$T(N) \in \Omega(N)$$

Pior caso: $\forall_{0<k<N}\, p[k-1] + p[k] > C$

$$T_{pc}(N) = 4(N-1) = 4N-4$$

$$T(N) \in O(N)$$

4.

Melhor caso: $\forall_{0 \leqslant k < N}\, p[k] > C$

$$T_{mc}(N) = \begin{cases} 0 & , N = 0 \\ 1 + T(N-1) & , N > 0 \end{cases}$$

$$T_{mc}(N) = N$$

$$T(N) \in \Omega(N)$$

Pior caso: $\sum_{i=0}^{N-1} p[i] \leqslant C$

$$T_{pc}(N) = \begin{cases} 0 & , N = 0 \\ 2 + 2 \cdot T(N-1) & , N > 0 \end{cases}$$

$$T_{pc}(N) = 2^N \cdot 0 + \sum_{i=0}^{N-1} \left(2^i \cdot 2\right) = 2 \cdot \sum_{i=0}^{N-1} 2^i = 2 \cdot \frac{1-2^N}{1-2} = 2\left(2^N - 1\right) = 2^{N+1} - 2$$

$$T(N) \in O\left(2^N\right)$$