1) $\sum_{i=1}^{n} 1 + \sum_{i=1}^{n} + \sum_{i=1}^{n} =$

$= n \cdot 1 + n \cdot 1 + n \cdot 1 = n + n + n$ $\boxed{\text{RES} \rightarrow 4}$

2) $\boxed{\text{RES} \rightarrow 3}$

3) $T(n) = \sum_{i=1}^{n} \left(\sum_{j=1}^{n} \left(\sum_{k=1}^{n} 1 \right) \right) =$

$= \sum_{i=1}^{n} \left(\sum_{j=1}^{n} n \right) = \sum_{i=1}^{n} \left(n^2 \right) = n^3$

$\boxed{\text{RES} \rightarrow 4}$

4) $T(n) = \begin{cases} 1 & \text{si } n = 1 \\ c + 2T(n-1) & \text{si } n \geq 2 \end{cases}$

supongamos que $n \geq 2$

paso ① $c + 2T(n-1)$

paso ② $c + 2\left[c + 2T(n-2) \right] =$

$= c + 2c + 4T(n-2) =$

$= 3c + 4T(n-2)$

paso ③ $3c + 4\left[c + 2T(n-3) \right] =$

$= 3c + 4c + 8T(n-3) = 7c + 8T(n-3)$

paso (i) $\left(2^{i}-1\right) \cdot c + 2^{i} \cdot T\left(n-i\right)$

caso base
$$n-i=1$$
$$n=1+i$$
$$\boxed{n-1=i}$$

reemplazo i

$$\left(2^{n-1}-1\right) \cdot c + 2^{n-1} \cdot T\left(n-(n-1)\right) =$$

$$= \left(\frac{2^n}{2}-1\right) \cdot c + \frac{2^n}{2} \cdot T(1) =$$

$$= 2^n \cdot \frac{c}{2} - c + 2^n \cdot \frac{1}{2} = T(n)$$

$O\left(2^n\right)$ $\boxed{\text{RES} \rightarrow d}$

5) si $n-1>1$

$\boxed{2T\left(n-1-1\right)+c}$ $\boxed{\text{RES} \rightarrow 3}$

6) algoritmo A $\rightarrow$ $T(n) = n \log 2(n)$

computadora 10.000 op x seg

si $n=1024 \rightarrow T(1024) = 1024 \cdot \log 2(1024) = 10240$

10 000 —— 1 seg

10 240 —— 1,024 seg

$\boxed{\text{RES} \rightarrow 1}$

4)

$$T(n)\begin{cases} 1 & n = 1 \\ 5 \cdot T\left(\frac{n}{4}\right) + n & \text{si } n >= 2 \end{cases}$$

si $n = 16$

$$5\,T\left(\frac{16}{4}\right) + 16 =$$

$$= 5\left[5\,T\left(\frac{4}{4}\right) + 4\right] + 16 =$$

$$= 5\,[5 \cdot 1 + 4] + 16 =$$

$$\boxed{= 25 + 20 + 16 = 61}$$

$\boxed{\text{RES} \rightarrow 4}$