① $T(n) = 8T(n/2) + 1000n^2$

$a = 8, \; b = 2, \; k = 2, \; p = 0$

$8 > 4$ $= \Theta(n^{\log_b a})$

$= \Theta(n^{\log_2 8})$

$= \Theta(n^4)$

② $T(n) = 2T\left(\frac{n}{2}\right) + n^2$

$a=2,\ b=2,\ k=2,\ p=0$

$2 \quad 2^2$

$2 < 4$

$= \left(n^k \log^p n\right)$

$= O(n^2 \log^0 n)$

$= n^2$

③ $T(n) = 2T\left(\frac{n}{2}\right) + 10n$

$a=2,\ b=2,\ k=1,\ p=0$

$2 = 2^1$

$T(n) = O\left(n^{\log_b a} \log^{p+1} n\right)$

$= O\left(n^{\log_2 2} \log^1 n\right)$

$= O(n \log n)$