$K = 1$

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(1)

(1) $T(n) = (n/2 + 1 + \log \cdot (\log n/2 + 1)$

$+ (n/2) \log + (n/2 \log (\log ($

Selecting max power we get

$\boxed{T(n) = O(x) \log n \cdot \log n)}$.

(2) $\log(\log(n))$.

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(Q2)

(a) $T(n) = \sqrt{2}\, T(n/2) + \log n$

$a = \sqrt{2} \quad b = 8 \quad K = 1 \quad P = 1$

$b^K = 2^1 = 2$

$a < b^K$ & $P \geq 0$

$T(n) = \theta(n^K \log^P n)$

$= \theta(n^1 \log^1 n)$

$= \theta(n \log n)$

(b) $T(n) = 7T(n/3) + n^2$

$a = 7 \quad b = 3 \quad K = 2 \quad P = 0$

$b^K = 3^2 = 9$

$a < b^K$ & $P \geq 0$

$\theta(n^K \log^P n)$

$\theta(n^2 \log^0 n)$

$\theta(n^2)$

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(c) $T(n) = 3T(n/4) + n\log n$

$a = 3$ $b = 4$ $K = 1$ $P = 1$

$b^K = 4^1 = 4$

$a < b^k$ $P \geq 0$

$T(n) = \theta(n^K \log^P n)$

$= \theta(n^1 \log^1 n)$

$= \theta(n \log n)$