* Master Theorem :-

If $\boxed{T(n) = aT(n/b) + \theta(n^k \cdot \log_b^p n)}$

where $a \geq 1,\ b > 1,\ k \geq 0,\ p$ is real

case-I : If $a > b^k$ then $T(n) = \theta(n^{\log_b a})$

case-II : If $a = b^k$ and

(i) $p < -1$ then $T(n) = \theta(n^{\log_b a})$

(ii) $p = -1$ then $T(n) = \theta(n^{\log_b a} \log_b \log_b n)$

(iii) $p > -1$ then $T(n) = \theta(n^{\log_b a} \log_b^{p+1} n)$

case-III $a < b^k$ and

(i) $p \leq 0$ then $T(n) = \theta(n^k)$ or $O(n^k)$

(ii) $p > 0$ then $T(n) = \theta(n^k \cdot \log_b^p n)$