

第三章

1). 5级流水时钟周期后为划分阶段后最长的阶段时间 $T = 2ns$

2). 流水化后 $T_{new} = (N+k-1) \times 2 + (N+k-2) \times 0.1 = (N+k) \times 2.1 - 2 \cdot 2$

$$S = \frac{T_{old}}{T_{new}} = \frac{7N}{2.1N+7.3} \quad \text{当 } N \rightarrow \infty \quad S = \frac{7}{2.1} = \frac{10}{3}$$

3) 当 $K \rightarrow \infty$ ~~则 $T_{new} = \frac{7N}{2.1N+2.1K-2.2}$~~

则每个阶段使用的时间很短可以忽略 $S = \lim_{K \rightarrow \infty} \frac{7N}{2.1N+2.1K-2.2} = \frac{7N}{2.1N} = \frac{7}{2} = 3.5$

$$T_{old} = 7N$$

$$T_{new} = \frac{7}{K} \cdot (N+k-1) + (N+k-2) \times 0.1$$
$$= \frac{7}{K} (N-1) + \frac{7}{K} \times k + 0.1N + 0.1k - 0.2$$

$$K \rightarrow \infty = 6.8 + 0.1(N+k)$$