

1. 1) 时钟周期至少应为 2.1 ns.

$$2) S \approx \frac{T_{\text{pipe}}}{T_{\text{cycle}}} = \frac{2.1 \text{ ns}}{7 \text{ ns}} = 0.3$$

$$3) S = \frac{T_{\text{pipe}}}{T_{\text{cycle}}} \times \frac{\text{CPI}_{\text{pipe}}}{\text{CPI}_{\text{cycle}}}$$
$$= \lim_{n \rightarrow +\infty} \frac{\frac{T_{\text{cycle}} + 0.1}{n}}{T_{\text{cycle}}} \times | \quad (n \rightarrow +\infty \text{ 是否可认为指令总数 } N \text{ 仍远大于 } n?)$$
$$\approx \lim_{n \rightarrow +\infty} \left(\frac{1}{n} + \frac{1}{70} \right) = \frac{1}{70}$$