

$$1. (1) T_{\text{pipe}} = \frac{1}{5} (7ns + 0.1 \times 5 ns) = 1.5 ns$$

(2)

$$S = \frac{T_{\text{cycle}}}{T_{\text{pipe}}} = \frac{7ns}{1.5ns} = \frac{14}{3}$$

$$(3) T_{\text{pipe}} = \lim_{n \rightarrow \infty} \left[\frac{1}{n} (7ns + 0.1 n ns) \right]$$

$$= \lim_{n \rightarrow \infty} \frac{0.1n + 7}{n}$$

$$= \lim_{n \rightarrow \infty} 0.1 + \frac{7}{n}$$

$$S = \frac{T_{\text{cycle}}}{T_{\text{pipe}}} = \frac{7ns}{\lim_{n \rightarrow \infty} (0.1 + \frac{7}{n})} = 70$$

∴ 加速比的极限为 70.