

(1) Derive DC Gain of $P(s)$ in terms of a, b, T

$$P(s) = \frac{bT}{s + aT}, \quad a, b > 0$$

$$T \in \{10, 100\}$$

$$P(0) = \frac{bT}{aT} = \frac{b}{a}$$

$$P(s) = \frac{K}{\tau s + 1}, \quad K \text{ is DC Gain}$$

$$P(s) = \frac{bT}{s + aT} = \frac{\frac{bT}{aT}}{\frac{1}{aT}s + 1}$$

$$= \frac{b/a}{\frac{1}{aT}s + 1} \Rightarrow K = \frac{b}{a}, \quad \tau = \frac{1}{aT}$$