

$$\textcircled{2} \quad d) \quad S_o = \frac{1}{1 + G_p G_c}$$

$$G_p = \frac{2(s+4)}{10s^2 + 7s + 1} \times e^{-2s}$$

$$G_c = K_c \left(1 + \frac{1}{T_I s} \right)$$

$$\Rightarrow S_o = \frac{1}{1 + \frac{2(s+4)}{10s^2 + 7s + 1} K_c \left(1 + \frac{1}{T_I s} \right) e^{-2s}}$$

$$\Rightarrow S_o(j\omega) = \frac{1}{1 + \frac{2(j\omega+4)}{(1-10\omega^2 + 7j\omega)} K_c \left(1 + \frac{1}{T_I j\omega} \right) e^{-2j\omega}}$$