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$f_s = 8000Hz \quad f_{p_1} = 1000Hz$

$\Omega_{p_1} = 2\pi \frac{f_{p_1}}{f_s} = 2\pi \frac{1000}{8000} = 0.25\pi$

$W_{p_1} = 2f_s \tan \frac{\Omega_p}{2} = 2\pi 8000 \times \tan \frac{\pi}{8}$

$= 6627.4$

$n = 2$

$H(s) = \frac{W_{p_1}^2}{s^2 + \sqrt{2} W_{p_1} s + W_{p_1}^2}, \quad s = jw \Leftrightarrow 2f_s \frac{z-1}{z+1}$

$\therefore H(z) = \frac{6627.4^2}{(6600 \frac{z-1}{z+1})^2 + 6627.4\sqrt{2}(6600 \frac{z-1}{z+1}) + 6627.4^2}$

$= \frac{1 + 2z^{-1} + z^{-2}}{6.24 - 1.66 z^{-1} + 3.41 z^{-2}} = \frac{Y(z)}{X(z)}$

$\therefore$ 系统的差分方程为 $6.24 y(n) - 1.66 y(n-1) + 3.41 y(n-2)$

$= x(n) + 2x(n-1) + x(n-2)$

$y(n) = 0.03 x(n) + 0.06 x(n-1) + 0.03 x(n-2) + 0.27 y(n-1)$

$- 0.33 y(n-2)$