

解: 由题可知 $n_f = d-1 = 1$, $n_g = n_a-1 = 1$. 故 $F(z^{-1}) = 1 + f_1 z^{-1}$, $G(z^{-1}) = g_0 + g_1 z^{-1}$.

(1) 用长除法:

$$\begin{array}{r}
 1 + 3.2z^{-1} \\
 1 - 1.7z^{-1} + 0.7z^{-2} \overline{) 1 + 1.5z^{-1} + 0.9z^{-2}} \\
 \underline{1 - 1.7z^{-1} + 0.7z^{-2}} \\
 3.2z^{-1} + 0.2z^{-2} \\
 \underline{3.2z^{-1} - 5.44z^{-2} + 2.24z^{-3}} \\
 5.64z^{-2} - 2.24z^{-3}
 \end{array}$$

故 $F(z^{-1}) = 1 + 3.2z^{-1}$.

$$z^{-d} G(z^{-1}) = z^{-2} G(z^{-1}) = 5.64z^{-2} - 2.24z^{-3}$$

$$\therefore G(z^{-1}) = 5.64 - 2.24z^{-1}.$$

(2) 用比较系数法:

$$\begin{aligned}
 1 + 1.5z^{-1} + 0.9z^{-2} &= (1 - 1.7z^{-1} + 0.7z^{-2})(1 + f_1 z^{-1}) + z^{-2}(g_0 + g_1 z^{-1}) \\
 &= 1 + z^{-1}(f_1 - 1.7) + z^{-2}(0.7 - 1.7f_1 + g_0) + z^{-3}(0.7f_1 + g_1)
 \end{aligned}$$

比较同次幂的系数有:

$$\begin{cases} f_1 - 1.7 = 1.5 \\ 0.7 - 1.7f_1 + g_0 = 0.9 \\ 0.7f_1 + g_1 = 0 \end{cases}$$

$$\Rightarrow \begin{cases} f_1 = 3.2 \\ g_0 = 5.64 \\ g_1 = -2.24 \end{cases}$$

$$\therefore F(z^{-1}) = 1 + 3.2z^{-1}.$$

$$G(z^{-1}) = 5.64 - 2.24z^{-1}.$$