

Filter Summary Report: TIA,simple,Z3,ZL

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10.76	INVALID-ORDER-76	$Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \frac{L_Ls}{C_LL_Ls^2+1} + R_L \right)$	20
10.77	INVALID-ORDER-77	$Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \frac{R_L(C_LL_Ls^2+1)}{C_LL_Ls^2+C_LR_Ls+1} \right)$	20
11	PolynomialError		20

1 Examined $H(z)$ for TIA simple Z3 ZL: $\frac{Z_3 Z_L g_m}{Z_3 g_m + Z_L g_m}$

$$H(z) = \frac{Z_3 Z_L g_m}{Z_3 g_m + Z_L g_m}$$

2 HP

3 BP

3.1 BP-1 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} \right)$

$$H(s) = \frac{L_L R_3 s}{C_L L_L R_3 s^2 + L_L s + R_3}$$

Parameters:

Q: $C_L R_3 \sqrt{\frac{1}{C_L L_L}}$
 wo: $\sqrt{\frac{1}{C_L L_L}}$
 bandwidth: $\frac{1}{C_L R_3}$
 K-LP: 0
 K-HP: 0
 K-BP: R_3
 Qz: 0
 Wz: None

3.2 BP-2 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right)$

$$H(s) = \frac{L_L R_3 R_L s}{C_L L_L R_3 R_L s^2 + R_3 R_L + s (L_L R_3 + L_L R_L)}$$

Parameters:

Q: $\frac{C_L R_3 R_L \sqrt{\frac{1}{C_L L_L}}}{R_3 + R_L}$
 wo: $\sqrt{\frac{1}{C_L L_L}}$
 bandwidth: $\frac{R_3 + R_L}{C_L R_3 R_L}$
 K-LP: 0
 K-HP: 0
 K-BP: $\frac{R_3 R_L}{R_3 + R_L}$
 Qz: 0
 Wz: None

3.3 BP-3 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right)$

$$H(s) = \frac{L_L R_L s}{L_L s + R_L + s^2 (C_3 L_L R_L + C_L L_L R_L)}$$

Parameters:

Q: $R_L \sqrt{\frac{1}{L_L (C_3 + C_L)}} (C_3 + C_L)$
 wo: $\sqrt{\frac{1}{L_L (C_3 + C_L)}}$
 bandwidth: $\frac{1}{R_L (C_3 + C_L)}$
 K-LP: 0
 K-HP: 0
 K-BP: R_L
 Qz: 0

Wz: None

3.4 BP-4 $Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} \right)$

Parameters:

Q: $R_3 \sqrt{\frac{1}{L_L (C_3 + C_L)}} (C_3 + C_L)$

wo: $\sqrt{\frac{1}{L_L (C_3 + C_L)}}$

bandwidth: $\frac{1}{R_3 (C_3 + C_L)}$

K-LP: 0

K-HP: 0

K-BP: R_3

Qz: 0

Wz: None

$$H(s) = \frac{L_L R_3 s}{L_L s + R_3 + s^2 (C_3 L_L R_3 + C_L L_L R_3)}$$

3.5 BP-5 $Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right)$

Parameters:

Q: $\frac{R_3 R_L \sqrt{\frac{1}{L_L (C_3 + C_L)}} (C_3 + C_L)}{R_3 + R_L}$

wo: $\sqrt{\frac{1}{L_L (C_3 + C_L)}}$

bandwidth: $\frac{R_3 + R_L}{R_3 R_L (C_3 + C_L)}$

K-LP: 0

K-HP: 0

K-BP: $\frac{R_3 R_L}{R_3 + R_L}$

Qz: 0

Wz: None

$$H(s) = \frac{L_L R_3 R_L s}{R_3 R_L + s^2 (C_3 L_L R_3 R_L + C_L L_L R_3 R_L) + s (L_L R_3 + L_L R_L)}$$

3.6 BP-6 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, R_L \right)$

Parameters:

Q: $C_3 R_L \sqrt{\frac{1}{C_3 L_3}}$

wo: $\sqrt{\frac{1}{C_3 L_3}}$

bandwidth: $\frac{1}{C_3 R_L}$

K-LP: 0

K-HP: 0

K-BP: R_L

Qz: 0

Wz: None

$$H(s) = \frac{L_3 R_L s}{C_3 L_3 R_L s^2 + L_3 s + R_L}$$

3.7 BP-7 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{R_L}{C_L R_L s + 1} \right)$

Parameters:

$$H(s) = \frac{L_3 R_L s}{L_3 s + R_L + s^2 (C_3 L_3 R_L + C_L L_3 R_L)}$$

Q: $R_L \sqrt{\frac{1}{L_3(C_3+C_L)}} (C_3 + C_L)$
 wo: $\sqrt{\frac{1}{L_3(C_3+C_L)}}$
 bandwidth: $\frac{1}{R_L(C_3+C_L)}$
 K-LP: 0
 K-HP: 0
 K-BP: R_L
 Qz: 0
 Wz: None

3.8 BP-8 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right)$

$$H(s) = \frac{L_3 L_L R_L s}{L_3 L_L s + L_3 R_L + L_L R_L + s^2 (C_3 L_3 L_L R_L + C_L L_3 L_L R_L)}$$

Parameters:

Q: $R_L \sqrt{\frac{L_3+L_L}{L_3 L_L (C_3+C_L)}} (C_3 + C_L)$
 wo: $\sqrt{\frac{L_3+L_L}{L_3 L_L (C_3+C_L)}}$
 bandwidth: $\frac{1}{R_L (C_3+C_L)}$
 K-LP: 0
 K-HP: 0
 K-BP: R_L
 Qz: 0
 Wz: None

3.9 BP-9 $Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, R_L \right)$

$$H(s) = \frac{L_3 R_3 R_L s}{C_3 L_3 R_3 R_L s^2 + R_3 R_L + s (L_3 R_3 + L_3 R_L)}$$

Parameters:

Q: $\frac{C_3 R_3 R_L \sqrt{\frac{1}{C_3 L_3}}}{R_3 + R_L}$
 wo: $\sqrt{\frac{1}{C_3 L_3}}$
 bandwidth: $\frac{R_3 + R_L}{C_3 R_3 R_L}$
 K-LP: 0
 K-HP: 0
 K-BP: $\frac{R_3 R_L}{R_3 + R_L}$
 Qz: 0
 Wz: None

3.10 BP-10 $Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{1}{C_L s} \right)$

$$H(s) = \frac{L_3 R_3 s}{L_3 s + R_3 + s^2 (C_3 L_3 R_3 + C_L L_3 R_3)}$$

Parameters:

Q: $R_3 \sqrt{\frac{1}{L_3(C_3+C_L)}} (C_3 + C_L)$
 wo: $\sqrt{\frac{1}{L_3(C_3+C_L)}}$
 bandwidth: $\frac{1}{R_3(C_3+C_L)}$
 K-LP: 0
 K-HP: 0
 K-BP: R_3
 Qz: 0
 Wz: None

3.11 BP-11 $Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{R_L}{C_L R_L s + 1} \right)$

$$H(s) = \frac{L_3 R_3 R_L s}{R_3 R_L + s^2 (C_3 L_3 R_3 R_L + C_L L_3 R_3 R_L) + s (L_3 R_3 + L_3 R_L)}$$

Parameters:

Q: $\frac{R_3 R_L \sqrt{\frac{1}{L_3 (C_3 + C_L)}} (C_3 + C_L)}{R_3 + R_L}$
 wo: $\sqrt{\frac{1}{L_3 (C_3 + C_L)}}$
 bandwidth: $\frac{R_3 + R_L}{R_3 R_L (C_3 + C_L)}$
 K-LP: 0
 K-HP: 0
 K-BP: $\frac{R_3 R_L}{R_3 + R_L}$
 Qz: 0
 Wz: None

3.12 BP-12 $Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} \right)$

$$H(s) = \frac{L_3 L_L R_3 s}{L_3 L_L s + L_3 R_3 + L_L R_3 + s^2 (C_3 L_3 L_L R_3 + C_L L_3 L_L R_3)}$$

Parameters:

Q: $R_3 \sqrt{\frac{L_3 + L_L}{L_3 L_L (C_3 + C_L)}} (C_3 + C_L)$
 wo: $\sqrt{\frac{L_3 + L_L}{L_3 L_L (C_3 + C_L)}}$
 bandwidth: $\frac{1}{R_3 (C_3 + C_L)}$
 K-LP: 0
 K-HP: 0
 K-BP: R_3
 Qz: 0
 Wz: None

3.13 BP-13 $Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right)$

$$H(s) = \frac{L_3 L_L R_3 R_L s}{L_3 R_3 R_L + L_L R_3 R_L + s^2 (C_3 L_3 L_L R_3 R_L + C_L L_3 L_L R_3 R_L) + s (L_3 L_L R_3 + L_3 L_L R_L)}$$

Parameters:

Q: $\frac{R_3 R_L \sqrt{\frac{L_3 + L_L}{L_3 L_L (C_3 + C_L)}} (C_3 + C_L)}{R_3 + R_L}$
 wo: $\sqrt{\frac{L_3 + L_L}{L_3 L_L (C_3 + C_L)}}$
 bandwidth: $\frac{R_3 + R_L}{R_3 R_L (C_3 + C_L)}$
 K-LP: 0
 K-HP: 0
 K-BP: $\frac{R_3 R_L}{R_3 + R_L}$
 Qz: 0
 Wz: None

4 LP

5 BS

5.1 BS-1 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, L_L s + \frac{1}{C_L s} \right)$

Parameters:

Q: $\frac{L_L \sqrt{\frac{1}{C_L L_L}}}{R_3}$
 wo: $\sqrt{\frac{1}{C_L L_L}}$
 bandwidth: $\frac{R_3}{L_L}$
 K-LP: R_3
 K-HP: R_3
 K-BP: 0
 Qz: None
 Wz: $\sqrt{\frac{1}{C_L L_L}}$

5.2 BS-2 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{R_L(C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1} \right)$

Parameters:

Q: $\frac{L_L \sqrt{\frac{1}{C_L L_L}}(R_3 + R_L)}{R_3 R_L}$
 wo: $\sqrt{\frac{1}{C_L L_L}}$
 bandwidth: $\frac{R_3 R_L}{L_L(R_3 + R_L)}$
 K-LP: $\frac{R_3 R_L}{R_3 + R_L}$
 K-HP: $\frac{R_3 R_L}{R_3 + R_L}$
 K-BP: 0
 Qz: None
 Wz: $\sqrt{\frac{1}{C_L L_L}}$

5.3 BS-3 $Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, R_L \right)$

Parameters:

Q: $\frac{L_3 \sqrt{\frac{1}{C_3 L_3}}}{R_L}$
 wo: $\sqrt{\frac{1}{C_3 L_3}}$
 bandwidth: $\frac{R_L}{L_3}$
 K-LP: R_L
 K-HP: R_L
 K-BP: 0
 Qz: None
 Wz: $\sqrt{\frac{1}{C_3 L_3}}$

5.4 BS-4 $Z(s) = \left(\infty, \infty, \frac{R_3(C_3 L_3 s^2 + 1)}{C_3 L_3 s^2 + C_3 R_3 s + 1}, \infty, \infty, R_L \right)$

Parameters:

$$H(s) = \frac{C_L L_L R_3 s^2 + R_3}{C_L L_L s^2 + C_L R_3 s + 1}$$

$$H(s) = \frac{C_L L_L R_3 R_L s^2 + R_3 R_L}{C_L R_3 R_L s + R_3 + R_L + s^2 (C_L L_L R_3 + C_L L_L R_L)}$$

$$H(s) = \frac{C_3 L_3 R_L s^2 + R_L}{C_3 L_3 s^2 + C_3 R_L s + 1}$$

$$H(s) = \frac{C_3 L_3 R_3 R_L s^2 + R_3 R_L}{C_3 R_3 R_L s + R_3 + R_L + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L)}$$

$$\begin{aligned}
\text{Q: } & \frac{L_3 \sqrt{\frac{1}{C_3 L_3}} (R_3 + R_L)}{R_3 R_L} \\
\text{wo: } & \sqrt{\frac{1}{C_3 L_3}} \\
\text{bandwidth: } & \frac{R_3 R_L}{L_3 (R_3 + R_L)} \\
\text{K-LP: } & \frac{R_3 R_L}{R_3 + R_L} \\
\text{K-HP: } & \frac{R_3 R_L}{R_3 + R_L} \\
\text{K-BP: } & 0 \\
\text{Qz: } & \text{None} \\
\text{Wz: } & \sqrt{\frac{1}{C_3 L_3}}
\end{aligned}$$

6 GE

$$\mathbf{6.1 \quad GE-1} \quad Z(s) = \left(\infty, \infty, R_3, \infty, \infty, L_L s + R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_L R_3 s^2 + C_L R_3 R_L s + R_3}{C_L L_L s^2 + s (C_L R_3 + C_L R_L) + 1}$$

Parameters:

$$\begin{aligned}
\text{Q: } & \frac{L_L \sqrt{\frac{1}{C_L L_L}}}{R_3 + R_L} \\
\text{wo: } & \sqrt{\frac{1}{C_L L_L}} \\
\text{bandwidth: } & \frac{R_3 + R_L}{L_L} \\
\text{K-LP: } & R_3 \\
\text{K-HP: } & R_3 \\
\text{K-BP: } & \frac{R_3 R_L}{R_3 + R_L} \\
\text{Qz: } & \frac{L_L \sqrt{\frac{1}{C_L L_L}}}{R_L} \\
\text{Wz: } & \sqrt{\frac{1}{C_L L_L}}
\end{aligned}$$

$$\mathbf{6.2 \quad GE-2} \quad Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$$

$$H(s) = \frac{C_L L_L R_3 R_L s^2 + L_L R_3 s + R_3 R_L}{L_L s + R_3 + R_L + s^2 (C_L L_L R_3 + C_L L_L R_L)}$$

Parameters:

$$\begin{aligned}
\text{Q: } & C_L \sqrt{\frac{1}{C_L L_L}} (R_3 + R_L) \\
\text{wo: } & \sqrt{\frac{1}{C_L L_L}} \\
\text{bandwidth: } & \frac{1}{C_L (R_3 + R_L)} \\
\text{K-LP: } & \frac{R_3 R_L}{R_3 + R_L} \\
\text{K-HP: } & \frac{R_3 R_L}{R_3 + R_L} \\
\text{K-BP: } & R_3 \\
\text{Qz: } & C_L R_L \sqrt{\frac{1}{C_L L_L}} \\
\text{Wz: } & \sqrt{\frac{1}{C_L L_L}}
\end{aligned}$$

$$\mathbf{6.3 \quad GE-3} \quad Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, R_L \right)$$

$$H(s) = \frac{C_3 L_3 R_L s^2 + C_3 R_3 R_L s + R_L}{C_3 L_3 s^2 + s (C_3 R_3 + C_3 R_L) + 1}$$

Parameters:

$$\begin{aligned}
\text{Q: } & \frac{L_3 \sqrt{\frac{1}{C_3 L_3}}}{R_3 + R_L} \\
\text{wo: } & \sqrt{\frac{1}{C_3 L_3}}
\end{aligned}$$

bandwidth: $\frac{R_3+R_L}{L_3}$
K-LP: R_L
K-HP: R_L
K-BP: $\frac{R_3 R_L}{R_3+R_L}$
Qz: $\frac{L_3 \sqrt{\frac{1}{C_3 L_3}}}{R_3}$
Wz: $\sqrt{\frac{1}{C_3 L_3}}$

6.4 GE-4 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, R_L \right)$

$$H(s) = \frac{C_3 L_3 R_3 R_L s^2 + L_3 R_L s + R_3 R_L}{L_3 s + R_3 + R_L + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L)}$$

Parameters:

Q: $C_3 \sqrt{\frac{1}{C_3 L_3}} (R_3 + R_L)$
wo: $\sqrt{\frac{1}{C_3 L_3}}$
bandwidth: $\frac{1}{C_3 (R_3 + R_L)}$
K-LP: $\frac{R_3 R_L}{R_3 + R_L}$
K-HP: $\frac{R_3 R_L}{R_3 + R_L}$
K-BP: R_L
Qz: $C_3 R_3 \sqrt{\frac{1}{C_3 L_3}}$
Wz: $\sqrt{\frac{1}{C_3 L_3}}$

7 AP

8 INVALID-NUMER

8.1 INVALID-NUMER-1 $Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, R_L + \frac{1}{C_L s} \right)$

$$H(s) = \frac{C_L R_3 R_L s + R_3}{C_3 C_L R_3 R_L s^2 + s (C_3 R_3 + C_L R_3 + C_L R_L) + 1}$$

Parameters:

Q: $\frac{C_3 C_L R_3 R_L \sqrt{\frac{1}{C_3 C_L R_3 R_L}}}{C_3 R_3 + C_L R_3 + C_L R_L}$
wo: $\sqrt{\frac{1}{C_3 C_L R_3 R_L}}$
bandwidth: $\frac{C_3 R_3 + C_L R_3 + C_L R_L}{C_3 C_L R_3 R_L}$
K-LP: R_3
K-HP: 0
K-BP: $\frac{C_L R_3 R_L}{C_3 R_3 + C_L R_3 + C_L R_L}$
Qz: 0
Wz: None

8.2 INVALID-NUMER-2 $Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L}{C_L R_L s + 1} \right)$

$$H(s) = \frac{C_3 R_3 R_L s + R_L}{C_3 C_L R_3 R_L s^2 + s (C_3 R_3 + C_3 R_L + C_L R_L) + 1}$$

Parameters:

Q: $\frac{C_3 C_L R_3 R_L \sqrt{\frac{1}{C_3 C_L R_3 R_L}}}{C_3 R_3 + C_3 R_L + C_L R_L}$
wo: $\sqrt{\frac{1}{C_3 C_L R_3 R_L}}$

bandwidth: $\frac{C_3 R_3 + C_3 R_L + C_L R_L}{C_3 C_L R_3 R_L}$
K-LP: R_L
K-HP: 0
K-BP: $\frac{C_3 R_3 R_L}{C_3 R_3 + C_3 R_L + C_L R_L}$
Qz: 0
Wz: None

9 INVALID-WZ

10 INVALID-ORDER

10.1 INVALID-ORDER-1 $Z(s) = (\infty, \infty, R_3, \infty, \infty, R_L)$

$$H(s) = \frac{R_3 R_L}{R_3 + R_L}$$

10.2 INVALID-ORDER-2 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{1}{C_L s}\right)$

$$H(s) = \frac{R_3}{C_L R_3 s + 1}$$

10.3 INVALID-ORDER-3 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$

$$H(s) = \frac{R_3 R_L}{C_L R_3 R_L s + R_3 + R_L}$$

10.4 INVALID-ORDER-4 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, R_L + \frac{1}{C_L s}\right)$

$$H(s) = \frac{C_L R_3 R_L s + R_3}{s(C_L R_3 + C_L R_L) + 1}$$

10.5 INVALID-ORDER-5 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, R_L\right)$

$$H(s) = \frac{R_L}{C_3 R_L s + 1}$$

10.6 INVALID-ORDER-6 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s}\right)$

$$H(s) = \frac{1}{s(C_3 + C_L)}$$

10.7 INVALID-ORDER-7 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$

$$H(s) = \frac{R_L}{s(C_3 R_L + C_L R_L) + 1}$$

$$\mathbf{10.8 \quad INVALID-ORDER-8} \quad Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L R_L s + 1}{C_3 C_L R_L s^2 + s(C_3 + C_L)}$$

$$\mathbf{10.9 \quad INVALID-ORDER-9} \quad Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, L_L s + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_L s^2 + 1}{C_3 C_L L_L s^3 + s(C_3 + C_L)}$$

$$\mathbf{10.10 \quad INVALID-ORDER-10} \quad Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} \right)$$

$$H(s) = \frac{L_L s}{s^2(C_3 L_L + C_L L_L) + 1}$$

$$\mathbf{10.11 \quad INVALID-ORDER-11} \quad Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_L s^2 + C_L R_L s + 1}{C_3 C_L L_L s^3 + C_3 C_L R_L s^2 + s(C_3 + C_L)}$$

$$\mathbf{10.12 \quad INVALID-ORDER-12} \quad Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$$

$$H(s) = \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_3 C_L L_L R_L s^3 + C_3 R_L s + s^2(C_3 L_L + C_L L_L) + 1}$$

$$\mathbf{10.13 \quad INVALID-ORDER-13} \quad Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{R_L(C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1} \right)$$

$$H(s) = \frac{C_L L_L R_L s^2 + R_L}{C_3 C_L L_L R_L s^3 + C_L L_L s^2 + s(C_3 R_L + C_L R_L) + 1}$$

$$\mathbf{10.14 \quad INVALID-ORDER-14} \quad Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, R_L \right)$$

$$H(s) = \frac{R_3 R_L}{C_3 R_3 R_L s + R_3 + R_L}$$

$$\mathbf{10.15 \quad INVALID-ORDER-15} \quad Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{1}{C_L s} \right)$$

$$H(s) = \frac{R_3}{s(C_3 R_3 + C_L R_3) + 1}$$

$$\mathbf{10.16 \quad INVALID-ORDER-16} \quad Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{R_L}{C_L R_L s + 1} \right)$$

$$H(s) = \frac{R_3 R_L}{R_3 + R_L + s(C_3 R_3 R_L + C_L R_3 R_L)}$$

$$\mathbf{10.17 \quad INVALID-ORDER-17} \quad Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, L_L s + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_L R_3 s^2 + R_3}{C_3 C_L L_L R_3 s^3 + C_L L_L s^2 + s(C_3 R_3 + C_L R_3) + 1}$$

$$10.18 \quad \text{INVALID-ORDER-18} \quad Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_L R_3 s^2 + C_L R_3 R_L s + R_3}{C_3 C_L L_L R_3 s^3 + s^2 (C_3 C_L R_3 R_L + C_L L_L) + s (C_3 R_3 + C_L R_3 + C_L R_L) + 1}$$

$$10.19 \quad \text{INVALID-ORDER-19} \quad Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$$

$$H(s) = \frac{C_L L_L R_3 R_L s^2 + L_L R_3 s + R_3 R_L}{C_3 C_L L_L R_3 R_L s^3 + R_3 + R_L + s^2 (C_3 L_L R_3 + C_L L_L R_3 + C_L L_L R_L) + s (C_3 R_3 R_L + L_L)}$$

$$10.20 \quad \text{INVALID-ORDER-20} \quad Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{R_L (C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1} \right)$$

$$H(s) = \frac{C_L L_L R_3 R_L s^2 + R_3 R_L}{C_3 C_L L_L R_3 R_L s^3 + R_3 + R_L + s^2 (C_L L_L R_3 + C_L L_L R_L) + s (C_3 R_3 R_L + C_L R_3 R_L)}$$

$$10.21 \quad \text{INVALID-ORDER-21} \quad Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, R_L \right)$$

$$H(s) = \frac{C_3 R_3 R_L s + R_L}{s (C_3 R_3 + C_3 R_L) + 1}$$

$$10.22 \quad \text{INVALID-ORDER-22} \quad Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 R_3 s + 1}{C_3 C_L R_3 s^2 + s (C_3 + C_L)}$$

$$10.23 \quad \text{INVALID-ORDER-23} \quad Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 C_L R_3 R_L s^2 + s (C_3 R_3 + C_L R_L) + 1}{s^2 (C_3 C_L R_3 + C_3 C_L R_L) + s (C_3 + C_L)}$$

$$10.24 \quad \text{INVALID-ORDER-24} \quad Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, L_L s + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 C_L L_L R_3 s^3 + C_3 R_3 s + C_L L_L s^2 + 1}{C_3 C_L L_L s^3 + C_3 C_L R_3 s^2 + s (C_3 + C_L)}$$

$$10.25 \quad \text{INVALID-ORDER-25} \quad Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} \right)$$

$$H(s) = \frac{C_3 L_L R_3 s^2 + L_L s}{C_3 C_L L_L R_3 s^3 + C_3 R_3 s + s^2 (C_3 L_L + C_L L_L) + 1}$$

$$10.26 \quad \text{INVALID-ORDER-26} \quad Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 C_L L_L R_3 s^3 + s^2 (C_3 C_L R_3 R_L + C_L L_L) + s (C_3 R_3 + C_L R_L) + 1}{C_3 C_L L_L s^3 + s^2 (C_3 C_L R_3 + C_3 C_L R_L) + s (C_3 + C_L)}$$

$$10.27 \quad \text{INVALID-ORDER-27} \quad Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right)$$

$$H(s) = \frac{C_3 L_L R_3 R_L s^2 + L_L R_L s}{C_3 C_L L_L R_3 R_L s^3 + R_L + s^2 (C_3 L_L R_3 + C_3 L_L R_L + C_L L_L R_L) + s (C_3 R_3 R_L + L_L)}$$

$$10.28 \quad \text{INVALID-ORDER-28} \quad Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$$

$$H(s) = \frac{C_3 C_L L_L R_3 R_L s^3 + R_L + s^2 (C_3 L_L R_3 + C_L L_L R_L) + s (C_3 R_3 R_L + L_L)}{s^3 (C_3 C_L L_L R_3 + C_3 C_L L_L R_L) + s^2 (C_3 L_L + C_L L_L) + s (C_3 R_3 + C_3 R_L) + 1}$$

$$10.29 \quad \text{INVALID-ORDER-29} \quad Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L (C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1} \right)$$

$$H(s) = \frac{C_3 C_L L_L R_3 R_L s^3 + C_3 R_3 R_L s + C_L L_L R_L s^2 + R_L}{s^3 (C_3 C_L L_L R_3 + C_3 C_L L_L R_L) + s^2 (C_3 C_L R_3 R_L + C_L L_L) + s (C_3 R_3 + C_3 R_L + C_L R_L) + 1}$$

$$10.30 \quad \text{INVALID-ORDER-30} \quad Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 L_3 s^2 + 1}{C_3 C_L L_3 s^3 + s (C_3 + C_L)}$$

$$10.31 \quad \text{INVALID-ORDER-31} \quad Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L}{C_L R_L s + 1} \right)$$

$$H(s) = \frac{C_3 L_3 R_L s^2 + R_L}{C_3 C_L L_3 R_L s^3 + C_3 L_3 s^2 + s (C_3 R_L + C_L R_L) + 1}$$

$$10.32 \quad \text{INVALID-ORDER-32} \quad Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 C_L L_3 R_L s^3 + C_3 L_3 s^2 + C_L R_L s + 1}{C_3 C_L L_3 s^3 + C_3 C_L R_L s^2 + s (C_3 + C_L)}$$

$$10.33 \quad \text{INVALID-ORDER-33} \quad Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, L_L s + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L s^4 + s^2 (C_3 L_3 + C_L L_L) + 1}{s^3 (C_3 C_L L_3 + C_3 C_L L_L) + s (C_3 + C_L)}$$

$$10.34 \quad \text{INVALID-ORDER-34} \quad Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} \right)$$

$$H(s) = \frac{C_3 L_3 L_L s^3 + L_L s}{C_3 C_L L_3 L_L s^4 + s^2 (C_3 L_3 + C_3 L_L + C_L L_L) + 1}$$

$$10.35 \quad \text{INVALID-ORDER-35} \quad Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L s^4 + C_3 C_L L_3 R_L s^3 + C_L R_L s + s^2 (C_3 L_3 + C_L L_L) + 1}{C_3 C_L R_L s^2 + s^3 (C_3 C_L L_3 + C_3 C_L L_L) + s (C_3 + C_L)}$$

$$10.36 \quad \text{INVALID-ORDER-36} \quad Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right)$$

$$H(s) = \frac{C_3 L_3 L_L R_L s^3 + L_L R_L s}{C_3 C_L L_3 L_L R_L s^4 + C_3 L_3 L_L s^3 + L_L s + R_L + s^2 (C_3 L_3 R_L + C_3 L_L R_L + C_L L_L R_L)}$$

$$\mathbf{10.37 \quad INVALID-ORDER-37} \quad Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L R_L s^4 + C_3 L_3 L_L s^3 + L_L s + R_L + s^2 (C_3 L_3 R_L + C_L L_L R_L)}{C_3 C_L L_3 L_L s^4 + C_3 C_L L_L R_L s^3 + C_3 R_L s + s^2 (C_3 L_3 + C_3 L_L + C_L L_L) + 1}$$

$$\mathbf{10.38 \quad INVALID-ORDER-38} \quad Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L (C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1} \right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L R_L s^4 + R_L + s^2 (C_3 L_3 R_L + C_L L_L R_L)}{C_3 C_L L_3 L_L s^4 + s^3 (C_3 C_L L_3 R_L + C_3 C_L L_L R_L) + s^2 (C_3 L_3 + C_L L_L) + s (C_3 R_L + C_L R_L) + 1}$$

$$\mathbf{10.39 \quad INVALID-ORDER-39} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{1}{C_L s} \right)$$

$$H(s) = \frac{L_3 s}{s^2 (C_3 L_3 + C_L L_3) + 1}$$

$$\mathbf{10.40 \quad INVALID-ORDER-40} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_3 R_L s^2 + L_3 s}{C_3 C_L L_3 R_L s^3 + C_L R_L s + s^2 (C_3 L_3 + C_L L_3) + 1}$$

$$\mathbf{10.41 \quad INVALID-ORDER-41} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, L_L s + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_3 L_L s^3 + L_3 s}{C_3 C_L L_3 L_L s^4 + s^2 (C_3 L_3 + C_L L_3 + C_L L_L) + 1}$$

$$\mathbf{10.42 \quad INVALID-ORDER-42} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} \right)$$

$$H(s) = \frac{L_3 L_L s}{L_3 + L_L + s^2 (C_3 L_3 L_L + C_L L_3 L_L)}$$

$$\mathbf{10.43 \quad INVALID-ORDER-43} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_3 L_L s^3 + C_L L_3 R_L s^2 + L_3 s}{C_3 C_L L_3 L_L s^4 + C_3 C_L L_3 R_L s^3 + C_L R_L s + s^2 (C_3 L_3 + C_L L_3 + C_L L_L) + 1}$$

$$\mathbf{10.44 \quad INVALID-ORDER-44} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$$

$$H(s) = \frac{C_L L_3 L_L R_L s^3 + L_3 L_L s^2 + L_3 R_L s}{C_3 C_L L_3 L_L R_L s^4 + R_L + s^3 (C_3 L_3 L_L + C_L L_3 L_L) + s^2 (C_3 L_3 R_L + C_L L_L R_L) + s (L_3 + L_L)}$$

$$\mathbf{10.45 \quad INVALID-ORDER-45} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{R_L (C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1} \right)$$

$$H(s) = \frac{C_L L_3 L_L R_L s^3 + L_3 R_L s}{C_3 C_L L_3 L_L R_L s^4 + C_L L_3 L_L s^3 + L_3 s + R_L + s^2 (C_3 L_3 R_L + C_L L_3 R_L + C_L L_L R_L)}$$

10.46 INVALID-ORDER-46 $Z(s) = \left(\infty, \infty, L_3s + R_3 + \frac{1}{C_3s}, \infty, \infty, \frac{1}{C_Ls} \right)$

$$H(s) = \frac{C_3L_3s^2 + C_3R_3s + 1}{C_3C_LL_3s^3 + C_3C_LR_3s^2 + s(C_3 + C_L)}$$

10.47 INVALID-ORDER-47 $Z(s) = \left(\infty, \infty, L_3s + R_3 + \frac{1}{C_3s}, \infty, \infty, \frac{R_L}{C_LR_Ls+1} \right)$

$$H(s) = \frac{C_3L_3R_Ls^2 + C_3R_3R_Ls + R_L}{C_3C_LL_3R_Ls^3 + s^2(C_3C_LR_3R_L + C_3L_3) + s(C_3R_3 + C_3R_L + C_LR_L) + 1}$$

10.48 INVALID-ORDER-48 $Z(s) = \left(\infty, \infty, L_3s + R_3 + \frac{1}{C_3s}, \infty, \infty, R_L + \frac{1}{C_Ls} \right)$

$$H(s) = \frac{C_3C_LL_3R_Ls^3 + s^2(C_3C_LR_3R_L + C_3L_3) + s(C_3R_3 + C_LR_L) + 1}{C_3C_LL_3s^3 + s^2(C_3C_LR_3 + C_3C_LR_L) + s(C_3 + C_L)}$$

10.49 INVALID-ORDER-49 $Z(s) = \left(\infty, \infty, L_3s + R_3 + \frac{1}{C_3s}, \infty, \infty, L_Ls + \frac{1}{C_Ls} \right)$

$$H(s) = \frac{C_3C_LL_3L_Ls^4 + C_3C_LL_R_3s^3 + C_3R_3s + s^2(C_3L_3 + C_LL_L) + 1}{C_3C_LR_3s^2 + s^3(C_3C_LL_3 + C_3C_LL_L) + s(C_3 + C_L)}$$

10.50 INVALID-ORDER-50 $Z(s) = \left(\infty, \infty, L_3s + R_3 + \frac{1}{C_3s}, \infty, \infty, \frac{L_Ls}{C_LL_Ls^2+1} \right)$

$$H(s) = \frac{C_3L_3L_Ls^3 + C_3L_LR_3s^2 + L_Ls}{C_3C_LL_3L_Ls^4 + C_3C_LL_R_3s^3 + C_3R_3s + s^2(C_3L_3 + C_3L_L + C_LL_L) + 1}$$

10.51 INVALID-ORDER-51 $Z(s) = \left(\infty, \infty, L_3s + R_3 + \frac{1}{C_3s}, \infty, \infty, L_Ls + R_L + \frac{1}{C_Ls} \right)$

$$H(s) = \frac{C_3C_LL_3L_Ls^4 + s^3(C_3C_LL_R_3 + C_3C_LL_LR_3) + s^2(C_3C_LR_3R_L + C_3L_3 + C_LL_L) + s(C_3R_3 + C_LR_L) + 1}{s^3(C_3C_LL_3 + C_3C_LL_L) + s^2(C_3C_LR_3 + C_3C_LR_L) + s(C_3 + C_L)}$$

10.52 INVALID-ORDER-52 $Z(s) = \left(\infty, \infty, L_3s + R_3 + \frac{1}{C_3s}, \infty, \infty, \frac{L_LR_Ls}{C_LL_LR_Ls^2+L_Ls+R_L} \right)$

$$H(s) = \frac{C_3L_3L_LR_Ls^3 + C_3L_LR_3R_Ls^2 + L_LR_Ls}{C_3C_LL_3L_LR_Ls^4 + R_L + s^3(C_3C_LL_R_3R_L + C_3L_3L_L) + s^2(C_3L_3R_L + C_3L_LR_3 + C_3L_LR_L + C_LL_LR_L) + s(C_3R_3R_L + L_L)}$$

10.53 INVALID-ORDER-53 $Z(s) = \left(\infty, \infty, L_3s + R_3 + \frac{1}{C_3s}, \infty, \infty, \frac{L_Ls}{C_LL_Ls^2+1} + R_L \right)$

$$H(s) = \frac{C_3C_LL_3L_LR_Ls^4 + R_L + s^3(C_3C_LL_R_3R_L + C_3L_3L_L) + s^2(C_3L_3R_L + C_3L_LR_3 + C_LL_LR_L) + s(C_3R_3R_L + L_L)}{C_3C_LL_3L_Ls^4 + s^3(C_3C_LL_R_3 + C_3C_LL_LR_L) + s^2(C_3L_3 + C_3L_L + C_LL_L) + s(C_3R_3 + C_3R_L) + 1}$$

10.54 INVALID-ORDER-54 $Z(s) = \left(\infty, \infty, L_3s + R_3 + \frac{1}{C_3s}, \infty, \infty, \frac{R_L(C_LL_Ls^2+1)}{C_LL_Ls^2+C_LR_Ls+1} \right)$

$$H(s) = \frac{C_3C_LL_3L_LR_Ls^4 + C_3C_LL_R_3R_Ls^3 + C_3R_3R_Ls + R_L + s^2(C_3L_3R_L + C_LL_LR_L)}{C_3C_LL_3L_Ls^4 + s^3(C_3C_LL_R_3 + C_3C_LL_LR_L) + s^2(C_3C_LR_3R_L + C_3L_3 + C_LL_L) + s(C_3R_3 + C_3R_L + C_LR_L) + 1}$$

$$10.55 \quad \text{INVALID-ORDER-55} \quad Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_3 R_3 R_L s^2 + L_3 R_3 s}{C_3 C_L L_3 R_3 R_L s^3 + R_3 + s^2 (C_3 L_3 R_3 + C_L L_3 R_3 + C_L L_3 R_L) + s (C_L R_3 R_L + L_3)}$$

$$10.56 \quad \text{INVALID-ORDER-56} \quad Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, L_L s + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_3 L_L R_3 s^3 + L_3 R_3 s}{C_3 C_L L_3 L_L R_3 s^4 + C_L L_3 L_L s^3 + L_3 s + R_3 + s^2 (C_3 L_3 R_3 + C_L L_3 R_3 + C_L L_L R_3)}$$

$$10.57 \quad \text{INVALID-ORDER-57} \quad Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_L L_3 L_L R_3 s^3 + C_L L_3 R_3 R_L s^2 + L_3 R_3 s}{C_3 C_L L_3 L_L R_3 s^4 + R_3 + s^3 (C_3 C_L L_3 R_3 R_L + C_L L_3 L_L) + s^2 (C_3 L_3 R_3 + C_L L_3 R_3 + C_L L_3 R_L + C_L L_L R_3) + s (C_L R_3 R_L + L_3)}$$

$$10.58 \quad \text{INVALID-ORDER-58} \quad Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$$

$$H(s) = \frac{C_L L_3 L_L R_3 R_L s^3 + L_3 L_L R_3 s^2 + L_3 R_3 R_L s}{C_3 C_L L_3 L_L R_3 R_L s^4 + R_3 R_L + s^3 (C_3 L_3 L_L R_3 + C_L L_3 L_L R_3 + C_L L_3 L_L R_L) + s^2 (C_3 L_3 R_3 R_L + C_L L_L R_3 R_L + L_3 L_L) + s (L_3 R_3 + L_3 R_L + L_L R_3)}$$

$$10.59 \quad \text{INVALID-ORDER-59} \quad Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{R_L (C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1} \right)$$

$$H(s) = \frac{C_L L_3 L_L R_3 R_L s^3 + L_3 R_3 R_L s}{C_3 C_L L_3 L_L R_3 R_L s^4 + R_3 R_L + s^3 (C_L L_3 L_L R_3 + C_L L_3 L_L R_L) + s^2 (C_3 L_3 R_3 R_L + C_L L_3 R_3 R_L + C_L L_L R_3 R_L) + s (L_3 R_3 + L_3 R_L)}$$

$$10.60 \quad \text{INVALID-ORDER-60} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_3 C_L L_3 R_3 s^3 + C_L R_3 s + s^2 (C_3 L_3 + C_L L_3) + 1}$$

$$10.61 \quad \text{INVALID-ORDER-61} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, \frac{R_L}{C_L R_L s + 1} \right)$$

$$H(s) = \frac{C_3 L_3 R_3 R_L s^2 + L_3 R_L s + R_3 R_L}{C_3 C_L L_3 R_3 R_L s^3 + R_3 + R_L + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L + C_L L_3 R_L) + s (C_L R_3 R_L + L_3)}$$

$$10.62 \quad \text{INVALID-ORDER-62} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, R_L + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 C_L L_3 R_3 R_L s^3 + R_3 + s^2 (C_3 L_3 R_3 + C_L L_3 R_L) + s (C_L R_3 R_L + L_3)}{s^3 (C_3 C_L L_3 R_3 + C_3 C_L L_3 R_L) + s^2 (C_3 L_3 + C_L L_3) + s (C_L R_3 + C_L R_L) + 1}$$

$$10.63 \quad \text{INVALID-ORDER-63} \quad Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, L_L s + \frac{1}{C_L s} \right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L R_3 s^4 + C_L L_3 L_L s^3 + L_3 s + R_3 + s^2 (C_3 L_3 R_3 + C_L L_L R_3)}{C_3 C_L L_3 L_L s^4 + C_3 C_L L_3 R_3 s^3 + C_L R_3 s + s^2 (C_3 L_3 + C_L L_3 + C_L L_L) + 1}$$

10.64 INVALID-ORDER-64 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} \right)$

$$H(s) = \frac{C_3 L_3 L_L R_3 s^3 + L_3 L_L s^2 + L_L R_3 s}{C_3 C_L L_3 L_L R_3 s^4 + R_3 + s^3 (C_3 L_3 L_L + C_L L_3 L_L) + s^2 (C_3 L_3 R_3 + C_L L_L R_3) + s (L_3 + L_L)}$$

10.65 INVALID-ORDER-65 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, L_L s + R_L + \frac{1}{C_L s} \right)$

$$H(s) = \frac{C_3 C_L L_3 L_L R_3 s^4 + R_3 + s^3 (C_3 C_L L_3 R_3 R_L + C_L L_3 L_L) + s^2 (C_3 L_3 R_3 + C_L L_3 R_L + C_L L_L R_3) + s (C_L R_3 R_L + L_3)}{C_3 C_L L_3 L_L s^4 + s^3 (C_3 C_L L_3 R_3 + C_3 C_L L_3 R_L) + s^2 (C_3 L_3 + C_L L_3 + C_L L_L) + s (C_L R_3 + C_L R_L) + 1}$$

10.66 INVALID-ORDER-66 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right)$

$$H(s) = \frac{C_3 L_3 L_L R_3 R_L s^3 + L_3 L_L R_L s^2 + L_L R_3 R_L s}{C_3 C_L L_3 L_L R_3 R_L s^4 + R_3 R_L + s^3 (C_3 L_3 L_L R_3 + C_3 L_3 L_L R_L + C_L L_3 L_L R_L) + s^2 (C_3 L_3 R_3 R_L + C_L L_L R_3 R_L + L_3 L_L) + s (L_3 R_L + L_L R_3 + L_L R_L)}$$

10.67 INVALID-ORDER-67 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$

$$H(s) = \frac{C_3 C_L L_3 L_L R_3 R_L s^4 + R_3 R_L + s^3 (C_3 L_3 L_L R_3 + C_L L_3 L_L R_L) + s^2 (C_3 L_3 R_3 R_L + C_L L_L R_3 R_L + L_3 L_L) + s (L_3 R_L + L_L R_3)}{R_3 + R_L + s^4 (C_3 C_L L_3 L_L R_3 + C_3 C_L L_3 L_L R_L) + s^3 (C_3 L_3 L_L + C_L L_3 L_L) + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L + C_L L_L R_3 + C_L L_L R_L) + s (L_3 + L_L)}$$

10.68 INVALID-ORDER-68 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1} + R_3, \infty, \infty, \frac{R_L (C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1} \right)$

$$H(s) = \frac{C_3 C_L L_3 L_L R_3 R_L s^4 + C_L L_3 L_L R_L s^3 + L_3 R_L s + R_3 R_L + s^2 (C_3 L_3 R_3 R_L + C_L L_L R_3 R_L)}{R_3 + R_L + s^4 (C_3 C_L L_3 L_L R_3 + C_3 C_L L_3 L_L R_L) + s^3 (C_3 C_L L_3 R_3 R_L + C_L L_3 L_L) + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L + C_L L_3 R_L + C_L L_L R_3 + C_L L_L R_L) + s (C_L R_3 R_L + L_3)}$$

10.69 INVALID-ORDER-69 $Z(s) = \left(\infty, \infty, \frac{R_3 (C_3 L_3 s^2 + 1)}{C_3 L_3 s^2 + C_3 R_3 s + 1}, \infty, \infty, \frac{1}{C_L s} \right)$

$$H(s) = \frac{C_3 L_3 R_3 s^2 + R_3}{C_3 C_L L_3 R_3 s^3 + C_3 L_3 s^2 + s (C_3 R_3 + C_L R_3) + 1}$$

10.70 INVALID-ORDER-70 $Z(s) = \left(\infty, \infty, \frac{R_3 (C_3 L_3 s^2 + 1)}{C_3 L_3 s^2 + C_3 R_3 s + 1}, \infty, \infty, \frac{R_L}{C_L R_L s + 1} \right)$

$$H(s) = \frac{C_3 L_3 R_3 R_L s^2 + R_3 R_L}{C_3 C_L L_3 R_3 R_L s^3 + R_3 + R_L + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L) + s (C_3 R_3 R_L + C_L R_3 R_L)}$$

10.71 INVALID-ORDER-71 $Z(s) = \left(\infty, \infty, \frac{R_3 (C_3 L_3 s^2 + 1)}{C_3 L_3 s^2 + C_3 R_3 s + 1}, \infty, \infty, R_L + \frac{1}{C_L s} \right)$

$$H(s) = \frac{C_3 C_L L_3 R_3 R_L s^3 + C_3 L_3 R_3 s^2 + C_L R_3 R_L s + R_3}{s^3 (C_3 C_L L_3 R_3 + C_3 C_L L_3 R_L) + s^2 (C_3 C_L R_3 R_L + C_3 L_3) + s (C_3 R_3 + C_L R_3 + C_L R_L) + 1}$$

10.72 INVALID-ORDER-72 $Z(s) = \left(\infty, \infty, \frac{R_3 (C_3 L_3 s^2 + 1)}{C_3 L_3 s^2 + C_3 R_3 s + 1}, \infty, \infty, L_L s + \frac{1}{C_L s} \right)$

$$H(s) = \frac{C_3 C_L L_3 L_L R_3 s^4 + R_3 + s^2 (C_3 L_3 R_3 + C_L L_L R_3)}{C_3 C_L L_3 L_L s^4 + s^3 (C_3 C_L L_3 R_3 + C_3 C_L L_L R_3) + s^2 (C_3 L_3 + C_L L_L) + s (C_3 R_3 + C_L R_3) + 1}$$

10.73 INVALID-ORDER-73 $Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \frac{L_Ls}{C_LL_Ls^2+1} \right)$

$$H(s) = \frac{C_3L_3L_LR_3s^3 + L_LR_3s}{C_3C_LL_3L_LR_3s^4 + C_3L_3L_Ls^3 + L_Ls + R_3 + s^2(C_3L_3R_3 + C_3L_LR_3 + C_LL_LR_3)}$$

10.74 INVALID-ORDER-74 $Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, L_Ls + R_L + \frac{1}{C_Ls} \right)$

$$H(s) = \frac{C_3C_LL_3L_LR_3s^4 + C_3C_LL_3R_3R_Ls^3 + C_LR_3R_Ls + R_3 + s^2(C_3L_3R_3 + C_LL_LR_3)}{C_3C_LL_3L_Ls^4 + s^3(C_3C_LL_3R_3 + C_3C_LL_3R_L + C_3C_LL_LR_3) + s^2(C_3C_LR_3R_L + C_3L_3 + C_LL_L) + s(C_3R_3 + C_LR_3 + C_LR_L) + 1}$$

10.75 INVALID-ORDER-75 $Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \frac{L_LR_Ls}{C_LL_LR_Ls^2+L_Ls+R_L} \right)$

$$H(s) = \frac{C_3L_3L_LR_3R_Ls^3 + L_LR_3R_Ls}{C_3C_LL_3L_LR_3R_Ls^4 + R_3R_L + s^3(C_3L_3L_LR_3 + C_3L_3L_LR_L) + s^2(C_3L_3R_3R_L + C_3L_LR_3R_L + C_LL_LR_3R_L) + s(L_LR_3 + L_LR_L)}$$

10.76 INVALID-ORDER-76 $Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \frac{L_Ls}{C_LL_Ls^2+1} + R_L \right)$

$$H(s) = \frac{C_3C_LL_3L_LR_3R_Ls^4 + C_3L_3L_LR_3s^3 + L_LR_3s + R_3R_L + s^2(C_3L_3R_3R_L + C_LL_LR_3R_L)}{R_3 + R_L + s^4(C_3C_LL_3L_LR_3 + C_3C_LL_3L_LR_L) + s^3(C_3C_LL_LR_3R_L + C_3L_3L_L) + s^2(C_3L_3R_3 + C_3L_3R_L + C_3L_LR_3 + C_LL_LR_3 + C_LL_LR_L) + s(C_3R_3R_L + L_L)}$$

10.77 INVALID-ORDER-77 $Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \frac{R_L(C_LL_Ls^2+1)}{C_LL_Ls^2+C_LR_Ls+1} \right)$

$$H(s) = \frac{C_3C_LL_3L_LR_3R_Ls^4 + R_3R_L + s^2(C_3L_3R_3R_L + C_LL_LR_3R_L)}{R_3 + R_L + s^4(C_3C_LL_3L_LR_3 + C_3C_LL_3L_LR_L) + s^3(C_3C_LL_3R_3R_L + C_3C_LL_LR_3R_L) + s^2(C_3L_3R_3 + C_3L_3R_L + C_LL_LR_3 + C_LL_LR_L) + s(C_3R_3R_L + C_LR_3R_L)}$$

11 PolynomialError