**MATLAB Code**

clear all; close all;  
s = tf('s');  
G = (-153)/(s^3+27\*s^2-1962\*s-52320); % transfer function  
figure(1)  
step(G) % plotting the bode step response of G(s)  
stepinfo(G)  
grid on;  
figure(2)  
impulse(G) % plotting the impulse response of G(s)  
grid on;  
figure(3)  
pzmap(G) % plotting the pole-zero map of G(s)  
a = findobj(gca,'type','line'); % findobj locates graphics objects with specific properties  
for i = 1:length(a)  
 set(a(i),'markersize',12)  
 set(a(i), 'linewidth',2)  
end  
figure(4)  
rlocus(G)  
set(findall(gcf,'type','line'),'linewidth',2); % findall returns the objects that have the specified  
 % properties and sets them to the specified values  
figure(5)  
bode(G) % plotting the bode plot of G(s)  
margin(G)  
sisotool(G)

**Plots of Step and Impulse responses**

Chart, scatter chart

Description automatically generated

Chart

Description automatically generated

**Pzmaps and time domain specifications and errors**

Chart, scatter chart

Description automatically generated

Text

Description automatically generated

**Root Locus**

Chart, line chart

Description automatically generated

**Bode Diagram with its subsequent specifications**

Chart, line chart

Description automatically generated

Graphical user interface, chart

Description automatically generated

**Simulink**

Diagram, text

Description automatically generated with medium confidence

Graphical user interface, table

Description automatically generated

Diagram

Description automatically generated

Graphical user interface, application, table, Excel

Description automatically generated

**Stability of the system:**

In the pole zero map, we can see that there is a pole in the RHP which indicates that the system response is unstable. The Bode plot also highlights that there is a pole in the RHP thus indicating an unstable system. This unstable system causes the phase to fall quickly, as seen in the Bode diagram.

The root locus also shows that the system is unstable as the pole remains in the RHP. This can also be observed for values of gain from zero to negative infinity. In either case, the system will remain unstable.

The same step response is obtained via Simulink, thus verifying the MATLAB response.