Función de Transferencia Figura 6 Taller de Bloques con MATLAB

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I. Linea de Comandos

```
g1 = tf(1, [1 10]);
g2 = tf(1, [1 1]);
g3 = tf([1 0 1], [1 4 4]);
g4 = tf([1 1], [1 6]);
h1 = tf([1 1], [1 2]);
h2 = 2;
h3 = 1;

gf1 = feedback(series(g3, g4), h1);
gf2 = feedback(series(gf1, g2), h2 / g4);
t = feedback(series(gf2, g1), h3);

t = minreal(t);
zpk(t)
```

```
ans =

                        0.5 (s+2) (s+1) (s^2 + 1)
  ----------------------------------------------------------------------
  (s+9.914) (s+1.907) (s^2 + 1.224s + 1.053) (s^2 + 5.954s + 18.39)

Continuous-time zero/pole/gain model.
Model Properties
```

```
figure;
subplot(2, 2, 1); step(t); title('Step Response'); grid on;
subplot(2, 2, 2); impulse(t); title('Impulse Response'); grid on;
subplot(2, 2, 3); bode(t); title('Bode Plot'); grid on;
subplot(2, 2, 4); pzmap(t); title('Pole-Zero Map'); grid on;
```

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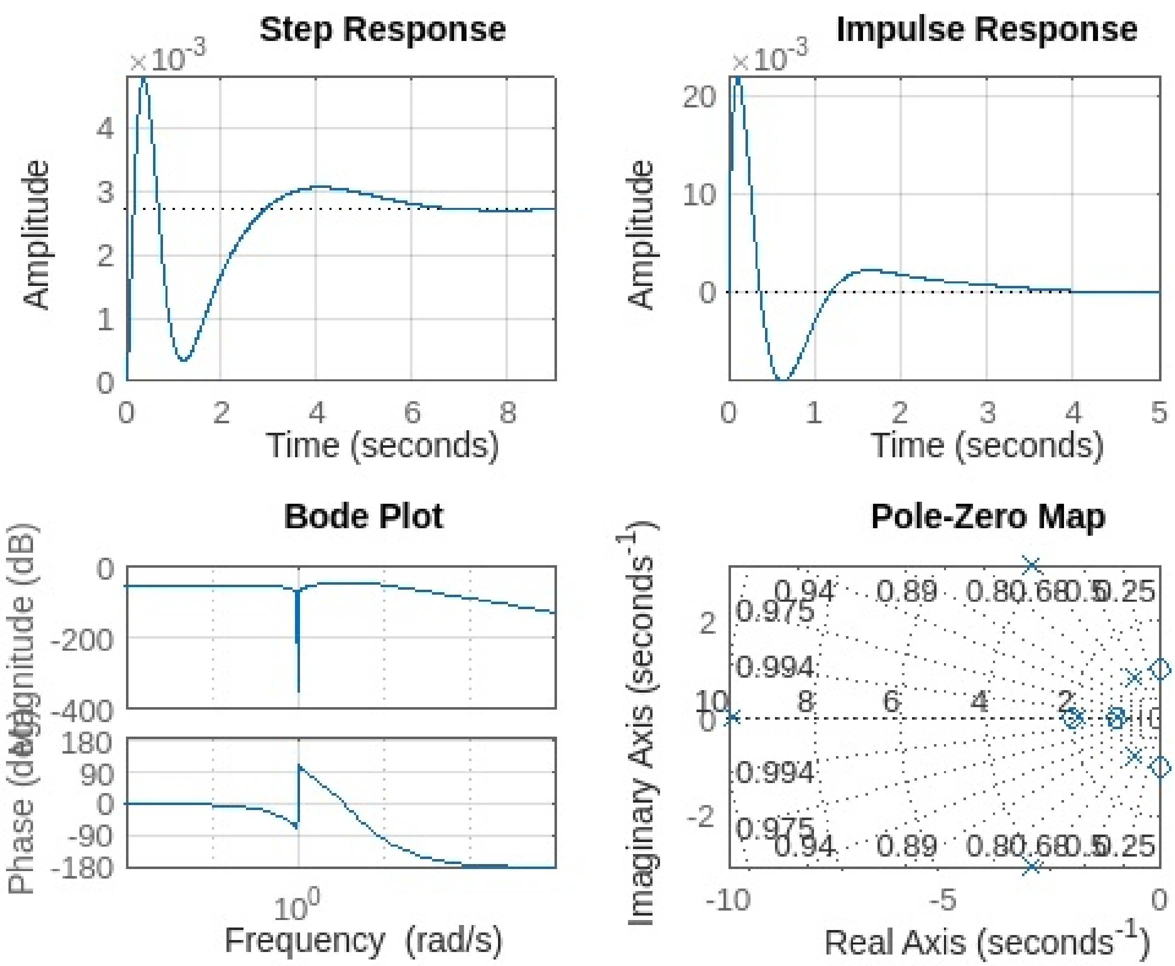

II. SIMULINK

```
[num, den] = linmod('Bloque_figura6')
```

```
num = 1x7
         0         0    0.5000    1.5000    1.5000    1.5000    1.0000

den = 1x7
    1.0000   19.0000  130.5000  480.5000  865.0000  773.0000  366.0000
```

```
GT=tf(num, den)
```

```
GT =

              0.5 s^4 + 1.5 s^3 + 1.5 s^2 + 1.5 s + 1
  ------------------------------------------------------------
  s^6 + 19 s^5 + 130.5 s^4 + 480.5 s^3 + 865 s^2 + 773 s + 366

Continuous-time transfer function.
Model Properties
```

```
GT = minreal(GT)
```

```
GT =

          0.5 s^4 + 1.5 s^3 + 1.5 s^2 + 1.5 s + 1
  ------------------------------------------------------------
  s^6 + 19 s^5 + 130.5 s^4 + 480.5 s^3 + 865 s^2 + 773 s + 366

Continuous-time transfer function.
Model Properties
```

```
zpk(GT)
```

```
ans =

                     0.5 (s+2) (s+1) (s^2 + 1)
  -----------------------------------------------------------------
  (s+9.914) (s+1.907) (s^2 + 1.224s + 1.053) (s^2 + 5.954s + 18.39)

Continuous-time zero/pole/gain model.
Model Properties
```

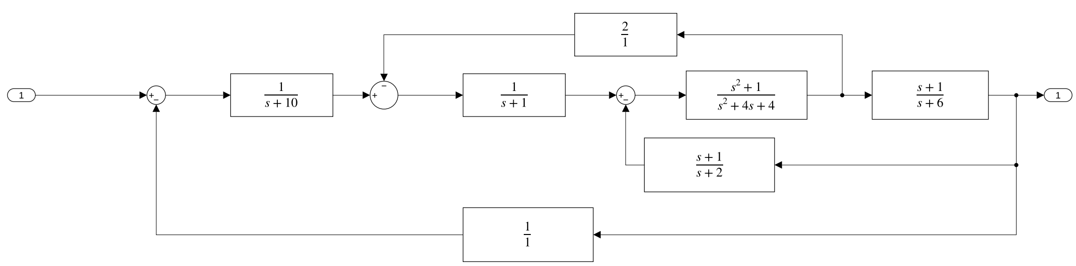

Figura 1. Sistema a analizar.

Se puede observar como las funciones obtenidas por ambos métodos son idénticas.

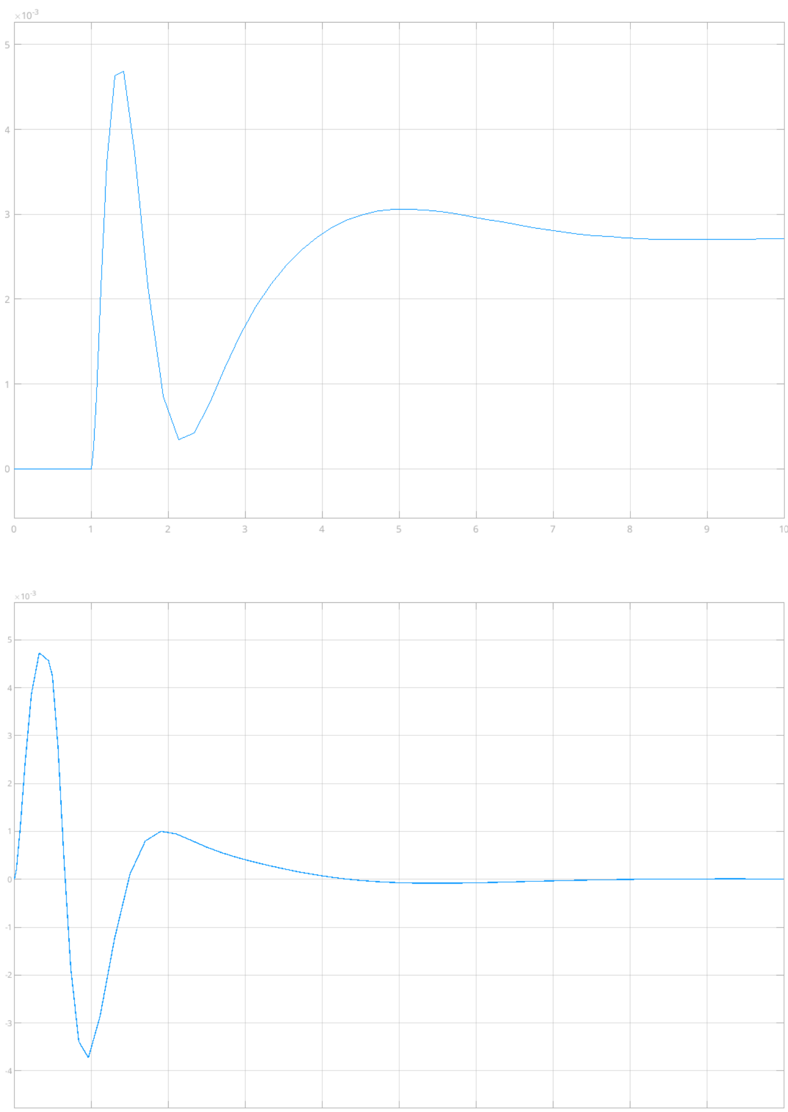

Figura 2. Reacción del sistema simulado, señal paso y señal impulso.