Tarea 3.

El código quedó así:

```matlab
%% Sistema masa-resorte-amortiguador 2-acoplado
% Parametros
M1 = 1;%[kg]
M2 = 1.5;
d1 = 0.01; %[N.S/m]
d2 = 0.015;
k1 = 1; %[N/m]
k2 = 1.2;
g = 9.81;
%syms y;

%u1 = heaviside(y)+M1*g;
%u2 = M2*g;

A = [0 1 0 0; k1/M2 d1/M2 -(k1+k2)/M2 -d1/M2; 0 0 0 1; -k1/M1 -d1/M1
k1/M1 d1/M1];
B = [0 0; 0 1/M2; 0 0; 1/M1 0];
C = [1 0 0 0; 0 0 0 0; 0 0 1 0; 0 0 0 0];
D = zeros(size(B));

%% Una forma, con ss(A,B,C,D,ui) y tf(sys)
sys = ss(A, B ,C, D);
tf(sys);
%ezplot(u1, [-1 3]);

%% Otra forma, con ss2tf
% for i=1:2
%     [num,den] = ss2tf(A,B,C,D,i);
%     for j=1:size(num,1)
%        tf(num(j, :),den)
%     end
% end

[num , den] = ss2tf(A,B,C,D,1);
G1 = tf(num(1, :), den)
G3 = tf(num(3, :), den)

[num1 , den1] = ss2tf(A,B,C,D,2);
Gs1 = tf(num1(1, :), den1)
Gs3 = tf(num1(3, :), den1)

%% Ejemplo random
% sys2 = rss(2,2,2); %sistema aleatorio de 2x2
% [A1 B1, C1, D1]= ssdata(sys2); %dar matrices A B C D del sistema
% sys2tf = ss(A1, B1, C1, D1, 1);
% tf(sys2tf)
t=0:1:20;
% Graficas
figure()
subplot(211), step(G1)
grid on
```

```
subplot(212), impulse(G1)
grid on
figure()
subplot(211), step(G3)
grid on
subplot(212), impulse(G3)
grid on
figure()
subplot(211), step(Gs1)
grid on
subplot(212), impulse(Gs1)
grid on
figure()
subplot(211), step(Gs3)
grid on
subplot(212), impulse(Gs3)
grid on
```
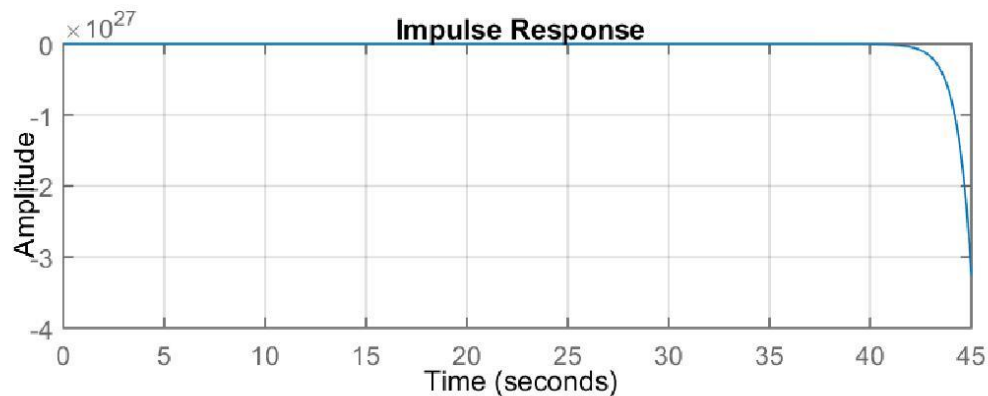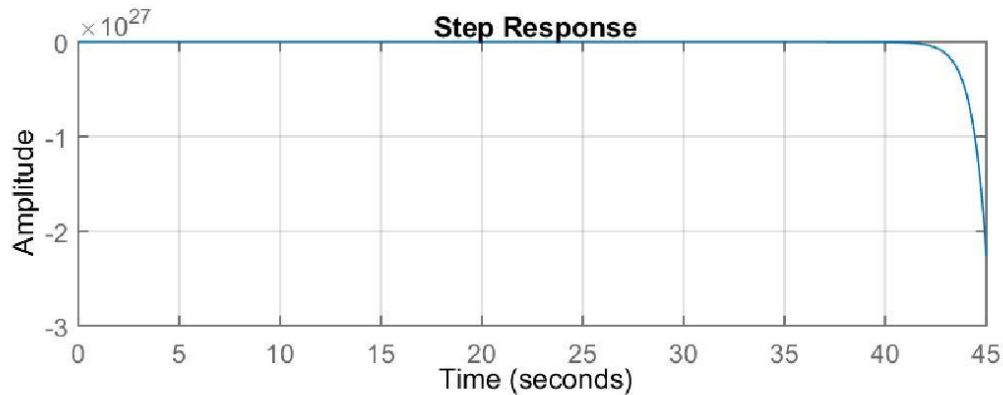
las funciones de transferencia con sus respectivas gráficas son:
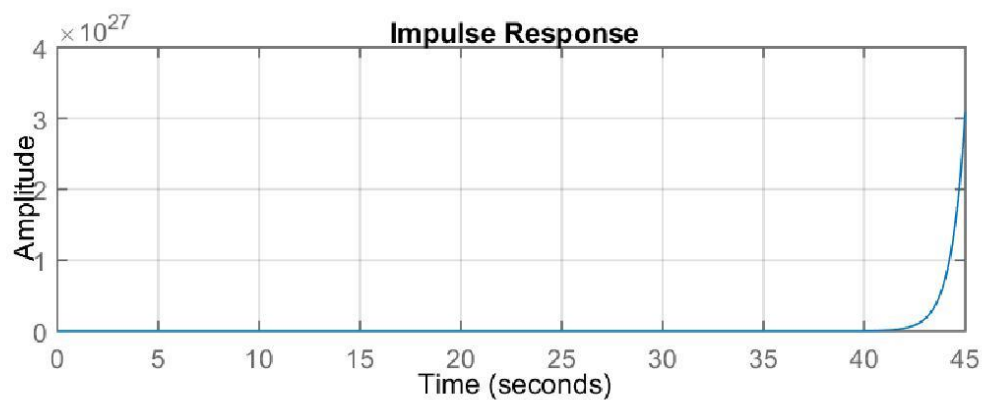
G1 =

　　　　-0.006667 s - 1.467

　---

　s^4 - 0.01667 s^3 - 1.667 s^2 - 0.008 s - 0.8

G3 =

     s^2 - 0.006667 s - 0.6667

  ----

 s^4 - 0.01667 s^3 - 1.667 s^2 - 0.008 s - 0
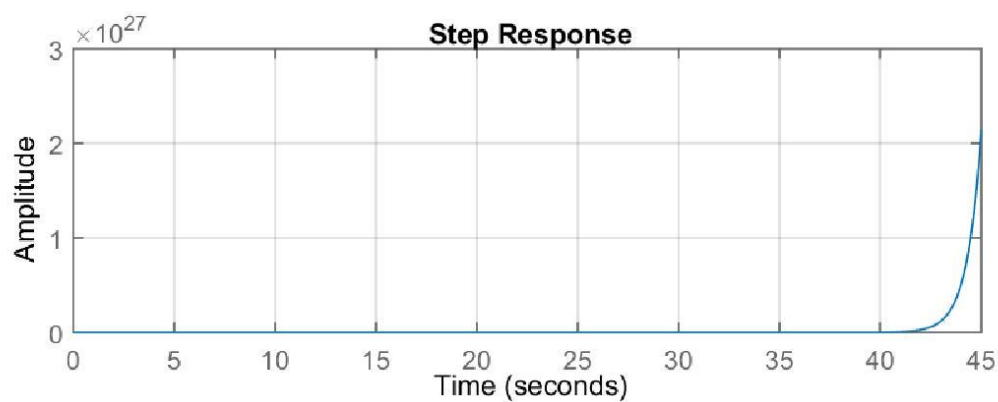
Gs1 =

  0.6667 s^2 - 0.006667 s - 0.6667

----

 s^4 - 0.01667 s^3 - 1.667 s^2 - 0.008 s - 0.8

Gs3 =

   -0.006667 s - 0.6667

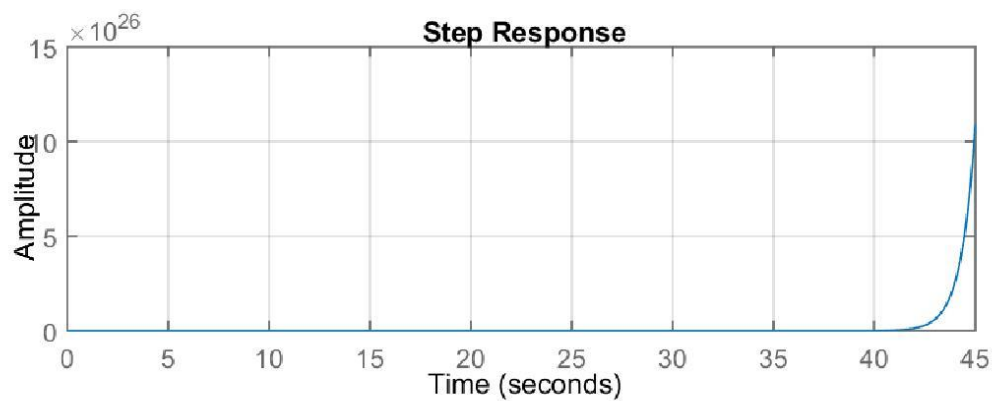   --

 s^4 - 0.01667 s^3 - 1.667 s^2 - 0.008 s - 0.8