```
>> %% ********** Q3 z(t) *********
syms t s;
p_t = 20*(heaviside(t) - heaviside(t-40)) - 10*(heaviside(t-40)-heaviside(t-60));
P = 1.1*abs(min(p_t));
x_t = (p_t + P)*cos(2*pi*t);
y_t = abs(x_t);
T_s = 0.01;
h_t = exp(-0.8*t)*heaviside(t)
% i wil be using the Transfer function with Laplace for Low Pass (z(t)

% step 1 Y(s)
Y_s = laplace(y_t);
H_s = laplace(h_t);
Z_s = H_s * Y_s
z_t = ilaplace(Z_s)
```

```
h_t =

exp(-(4*t)/5)*heaviside(t)


Z_s =

(10*exp(-60*s)*laplace(abs(cos(2*pi*(t + 60))), t, s) - 30*exp(-40*s)*laplace(abs(cos ↙
(2*pi*(t + 40))), t, s) + 20*laplace(abs(cos(2*pi*t)), t, s) + (11*laplace(abs ↙
(10*heaviside(t - 60) - 30*heaviside(t - 40) + 20*heaviside(t))*abs(cos(2*pi*t)), t, ↙
s))/10)/(s + 4/5)


z_t =

10*heaviside(t - 60)*ilaplace(laplace(abs(cos(2*pi*(t + 60))), t, s)/(s + 4/5), s, t ↙
- 60) - 30*heaviside(t - 40)*ilaplace(laplace(abs(cos(2*pi*(t + 40))), t, s)/(s + ↙
4/5), s, t - 40) + 20*ilaplace(laplace(abs(cos(2*pi*t)), t, s)/(s + 4/5), s, t) + ↙
(11*ilaplace(laplace(abs(10*heaviside(t - 60) - 30*heaviside(t - 40) + 20*heaviside ↙
(t))*abs(cos(2*pi*t)), t, s)/(s + 4/5), s, t))/10

>>
```