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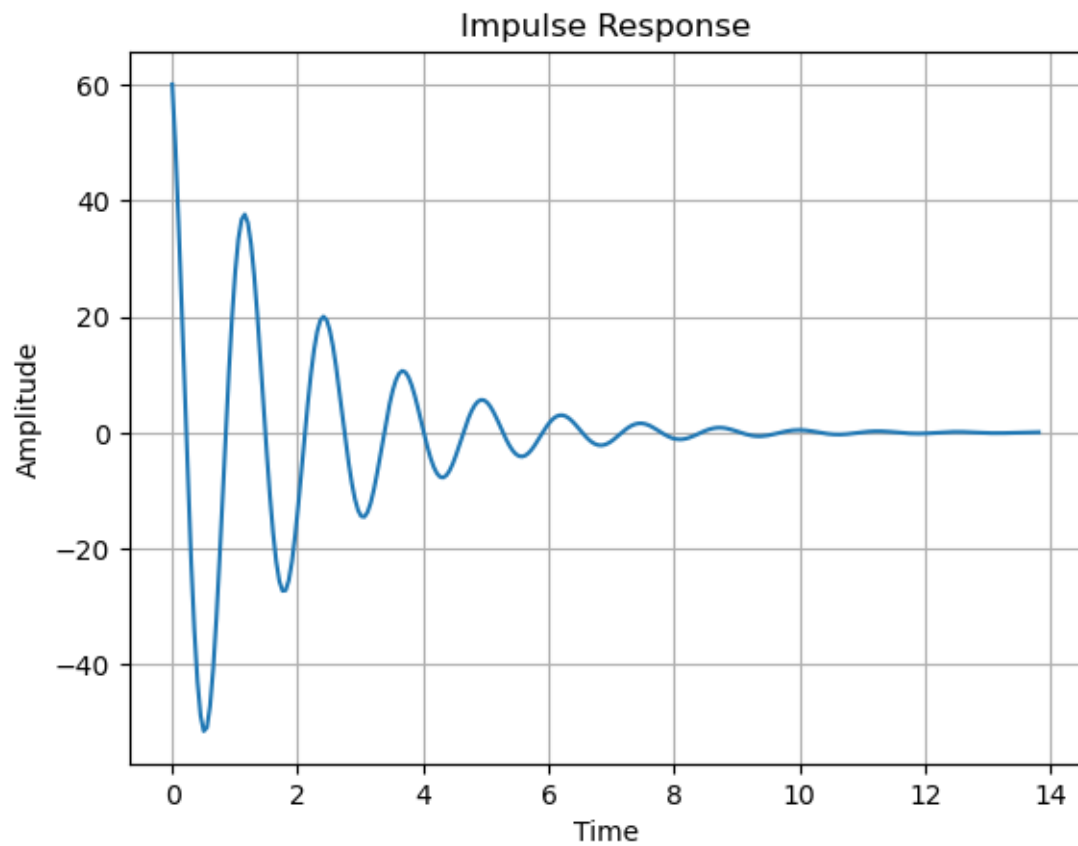
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Hal : UTS Sistem Pengaturan

Hari/Tanggal : 26 Oktober 2023

1. Menentukan transfer function dengan  $K = 60$  (**NIM BELAKANG**)
2. Menghitung nilai karakteristik transient response (**IMPULSE RESPONSE**)

Hasil Pengerjaan :



Didapatkan nilai

Delay Time: 0.00

Rise Time: 0.00

Peak Time: 0.00

Settling Time: 7.59

Maximum Overshoot: 5900.00%

Source Code Python (Jupyter Notebook):

### **## Import Library**

```
import control as ctrl  
  
import matplotlib.pyplot as plt  
  
import numpy as np  
  
from control.matlab import step, impulse
```

### **## Menentukan Transfer Function**

```
num = [60 , -120]  
  
den = [1,1,25]  
  
system = ctrl.TransferFunction(num, den)
```

### **## Membuat model impulse response**

```
time, response = ctrl.impulse_response(system)  
  
plt.plot(time,response)  
  
plt.title('Impulse Response')  
  
plt.xlabel('Time')  
  
plt.ylabel('Amplitude')  
  
plt.grid()  
  
plt.show()
```

### **## Menghitung nilai karakteristik transient responnya**

```
delay_time = time[next(i for i, t in enumerate(response) if t >= 0)]  
  
rise_time = time[next(i for i, t in enumerate(response) if t >= 0.1 * max(response))] -  
delay_time  
  
peak_time = time[response.argmax()] - delay_time  
  
settling_time = max(t for i, t in enumerate(time) if max(response) * 0.02 < response[i]) -  
delay_time  
  
max_overshoot = ((max(response) - 1) / 1) * 100  
  
  
print("Delay Time: {:.2f}".format(delay_time))  
  
print("Rise Time: {:.2f}".format(rise_time))  
  
print("Peak Time: {:.2f}".format(peak_time))  
  
print("Settling Time: {:.2f}".format(settling_time))  
  
print("Maximum Overshoot: {:.2f}%".format(max_overshoot))
```

## Dokumentasi Pengerjaan :

