

# Problem Wk.5.5.2: Modeling the Plant

Read the handout for Homework Assignment 2.

## Integrator System Function

Enter the system function  $\frac{\Theta_h}{\Omega_h}$  for the integrator below, in terms of  $T$ . Use a capital  $\mathbb{R}$  for the delay operator  $R$ .

Numerator:

Denominator:

## Motor System Function

Enter the system function  $\frac{\Omega_h}{V_c}$  for the motor below, in terms of  $k_m$ ,  $k_b$ ,  $r_m$ , and  $T$ . Use a capital  $\mathbb{R}$  for the delay operator  $R$ .

Numerator:

Denominator:

## Plant System Function

Enter the system function  $\frac{\Theta_h}{V_c}$  for the plant below, in terms of  $k_m$ ,  $k_b$ ,  $r_m$ , and  $T$ . Use a capital  $\mathbb{R}$  for the delay operator  $R$ .

Numerator:

Denominator:

## Block Diagram

Upload a PDF file containing your block diagram for the plant. **Make sure you have clearly labeled which part corresponds to the motor, and which to the integrator.** Please double-check that your file is a valid PDF before uploading. You will be able to check that the file is correctly uploaded.

## Code

Enter your code for for the plant model below. Include your code for `integrator`, `motorModel`, and `plantModel`. The global variables defined in `hw2Work.py` can be used in your definition; do not use the numerical values in your code, use the variable names. Your code may use functions from the `sf` module, such as `sf.Gain(...)`; no `import` statements should be needed.

```
def integrator(T):
    pass #your code here

def motorModel(T):
    pass #your code here

def plantModel(T):
    pass #your code here
```

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