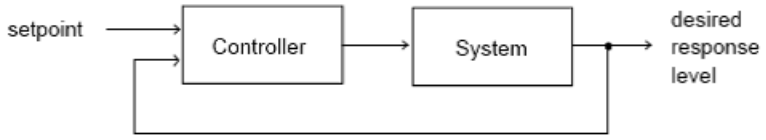
Zewail City for Science and Technology
Nanotechnology Engineering Program
Simulation Assignment #3

NANENG 512
Applied Digital Control and Drives
FALL 2020

In industrial field PID controller is widely used where achieve acceptable result.



The system form:

- Unity feed back system with feed forward transfer function:

$$G(s) = \frac{s^2+3s+2.6}{s^3+5.6s^2+4.9s+5}$$

If the system requirements are:

- $M_P < 5\%$, $T_s = 3$ sec and steady state output due to unit step =1

Now, try to answer the following using MATLAB:

1. Find system characteristics (damped and natural frequency, damping ratio, max. over shoot ,t_p, t_r, e_{ss}).
2. What is the effect of the PI controller on the above system? Comment in the effect?
3. What is the effect of the PD controller on the above system? Comment in the effect?
4. Apply PID controller to satisfy the above requirements and Comment on the result.

Assignment Rules:

- **All Figures** used must be included (screenshot) in the assignment.
- Assignment has to be typed. No handwriting.
- The assignment presented on Word/LaTex processor.
- There is will be a discussion for this assignment.

General Rules:

- Assignment can be done individually.
- **Any duplicate assignments will get zero mark.**
- Keep the comments in the assignment short and to the point.
- Late assignments will not be accepted whatever the excuse.