



IIT ROORKEE



NPTEL ONLINE
CERTIFICATION COURSE

APPLICATION OF MATLAB IN AUTOMATIC CONTROL

TRANSFER FUNCTION, POLES, ZEROS, RESPONSE

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PROBLEM

1. Create the following transfer function using MATLAB

$$H(s) = \frac{s+2}{s^2+3s+1}$$

and then convert from polynomial form to factored form.

PROBLEM

2. Create the following transfer function by assigning a variable as a variable of the transfer function

$$T(s) = \frac{(s-2)(s+1)}{(s+3)^2(s-5)}$$

Then, convert this transfer function from factored form to polynomial form.

PROBLEM

3. Find the poles and zeros of the following transfer function and plot them in the complex plane.

$$H(s) = \frac{s+4}{(s+1)^2(s+3)}$$

PROBLEM

4. Consider a system with the following transfer function :

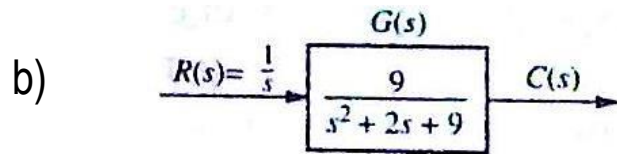
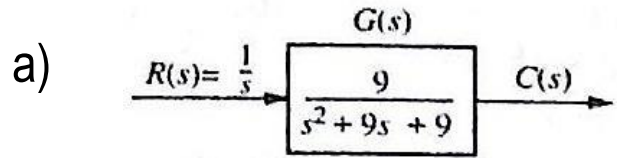
$$G(s) = \frac{s^2 + 2s + 1}{s^3 + 4s^2 + 8s + 6}$$

Find the poles and zeros of the system and then in a tab with 3 sub-windows plot :

1. The impulse response of the system
2. The step response of the system
3. The response when we have as input the signal $2\cos(1.6t)$, in the interval $[0, 10]$.

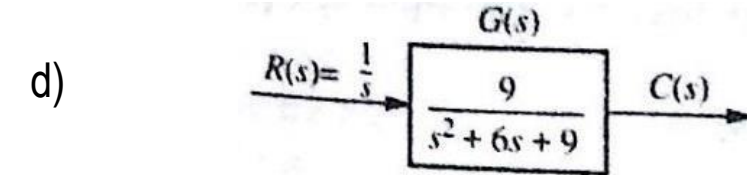
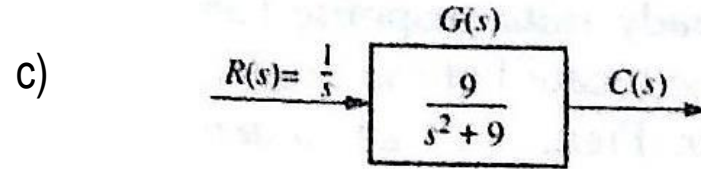
PROBLEM

5. Plot the response of the following transfer functions.



e)

$$G(s) = \frac{50}{s+50}$$



Ref :- Norman S. Nise, Control Systems Engineering, Wiley, 2013

REFERENCE BOOKS

- Norman S. Nise, Control Systems Engineering, Wiley, 2013
- Katsuhiko Ogata, Modern Control Engineering, Prentice Hall, 2010.

