1 **Name:** **Points:**

1. Consider the following system $H(s) = \frac{5}{(s+3)(s+5)}$. (*2 points*)

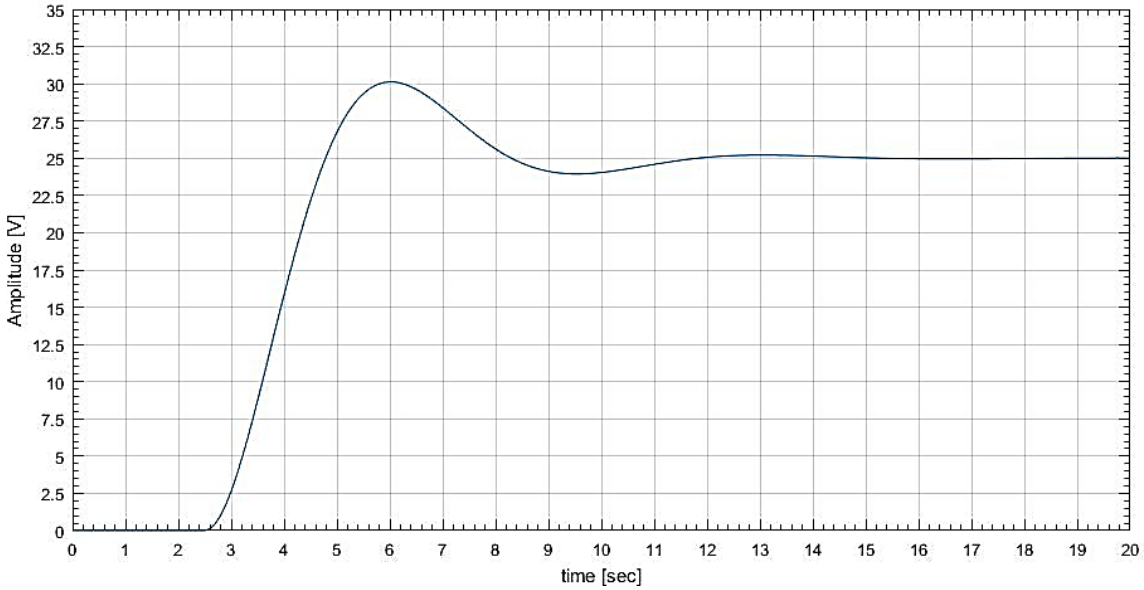
   a) How much is the static gain? How you calculate it?

   b) What is the dominant time constant? How you calculate it?

2. Consider the following unit step response (*excitation starts at t=0 sec!!*) of an unknown system. Give a numeric estimation and <u>mark on the figure how you measure</u> the following quantities: (*2 points*)

   a) Dominant time constant

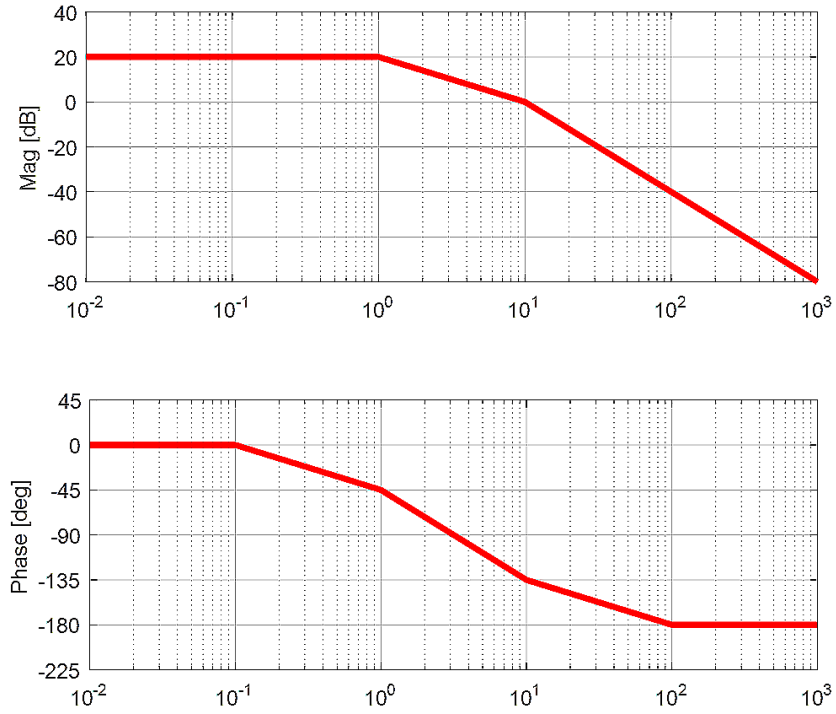
   b) Rise time



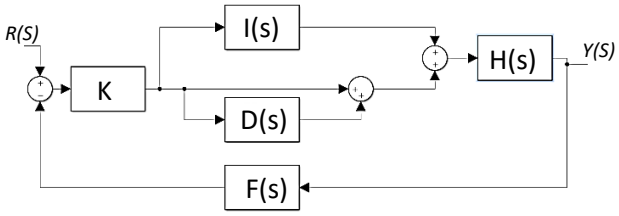
3. Consider the following Bode plot of an unknown system. . Give a numeric estimation and <u>mark on the figure how you measure</u> the following quantities: (*2 points*)

   a) Gain margin

   b) Phase margin



4. Consider the following setup:
   a) Simplify it and give the equivalent one block model with respect to *R(s)* and *Y(S)* signals (*2 points*)



   b) Using Matlab notations, what would be the input argument of Matlab command bode() *(1 point)*

      bode( );

5. Below a room temperature measurement can be seen. Two different controllers are tested: P, PID. The user set the desired temperature to 25 °C. Which one is the P/PID controller graph? Why? (*1 point*)