Lab 1 – System Modelling and Feedback Systems

XMUT315 Control Systems Engineering

Laboratory 1 - System Modelling and Feedback Systems

1. System modelling in Matlab.
2. Feedback control system in Simulink.

1. For a transfer function given by:

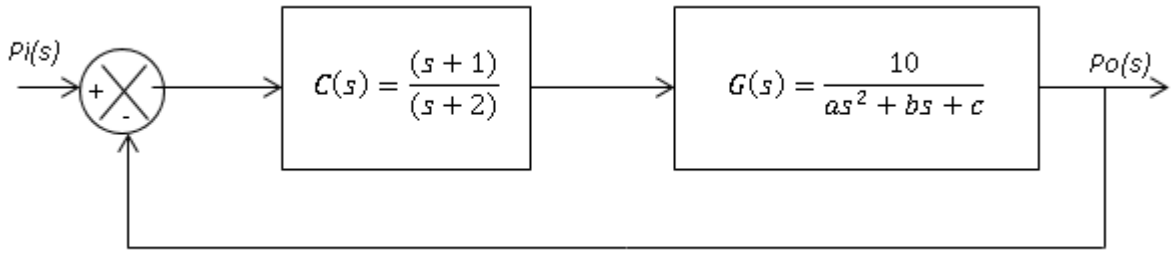
$$G(s) = \frac{a}{s^2 + 4s + a}$$

   a. Write a Matlab m-file that will display the step response of this system for various values of a = 1, 2, 4, and 8. [20 marks]

   b. Plot the responses together on one graph. [10 marks]

   c. Comment on the results of your plot. [10 marks]

2. You are given a block diagram model of a control system:



a. Create a Simulink model of the above given system (Hint: use the mask editor feature in Simulink for easy editing of the variables).

[30 marks]

b. Plot the output (*Po*) when the control system is subjected to a step input.

i. Case when G(s): a = 1, b = 2, and c = 4. [10 marks]

ii. Case when G(s): a = 1, b = 2, and c = 0.5. [10 marks]

c. Comment on the differences that you observed in part (b) and relate your comment to the benefits of feedback application in control system.

[10 marks]