Ministry of Higher Education And Scientific Research
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# Control Foundations

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Experiment no. 5:The effect of nonlinear element on the response of the control system

Objective:

1- To learn how to describe the effect of nonlinear element on the response ofthe control system .

2- To observe the output response of control system without nonlinear & withnonlinear control system,

Procedure:

1- Run Matlab by selecting [start] →Matlab 6.5 →Matlab command windowopens.

2- In Matlab command window →Simulink.

3- In untitled window draw the block diagram as shown in figure below.
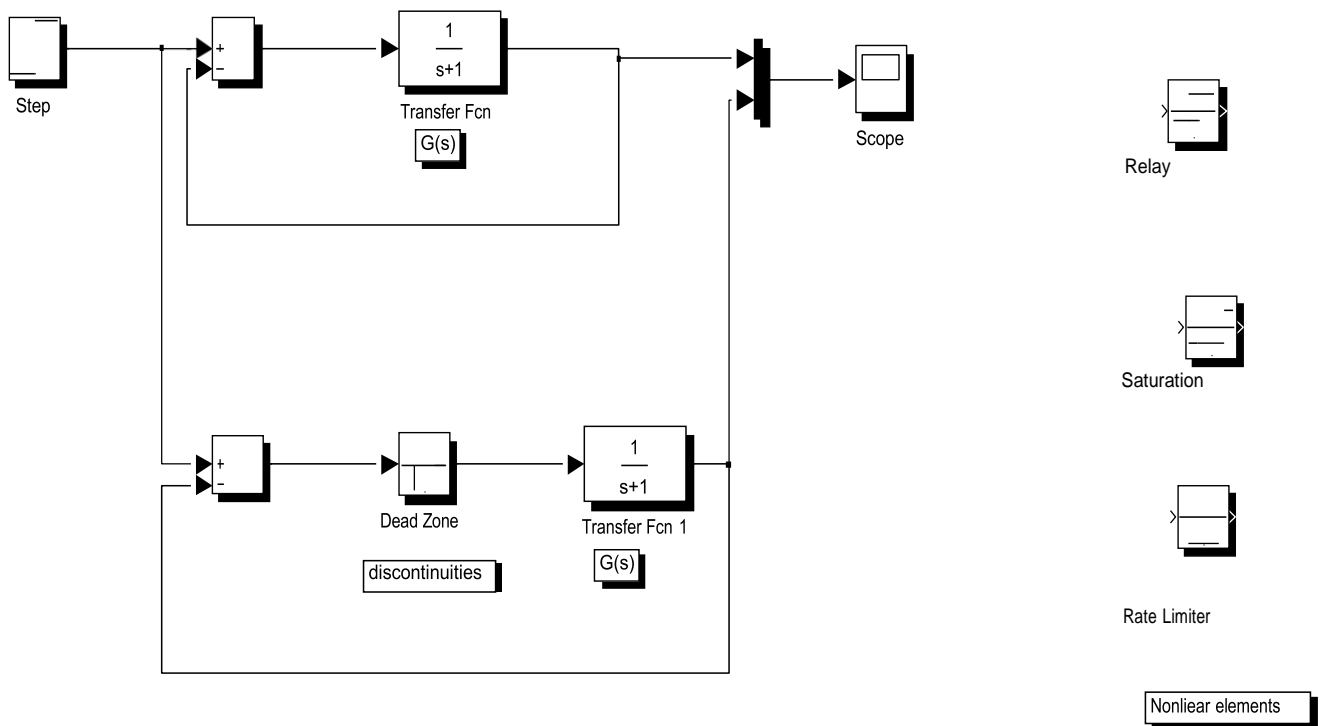
4- Set the step block step time to zero.

5-Transfer function are:

$$1 - G(s) = \frac{1}{s^2 + s + 1}$$

$$2 - G(s) = \frac{s + 2}{s^2 + 4s + 10}$$

$$3 - G(s) = \frac{3s}{s^2 + 5s + 15}$$

6-The nonlinear elements are
a-dead zone   b-saturation   c-rate limiter   d-relay

Discussion:

1-Compare the response of control system with and without nonlinear element?2-What the best response from the results and why?

3-Find the specification of transient response for each case?