College of Engineering Technology Medical Instrumentation Techniques Engineering Department





Experiment One Mathematical Model Response

Object

- 1-To learn how to derive the transfer function of a linear electric system.
- 2- To represent the system response on personal computer by using MATLAB and Simulink with the transfer function of the system.

Theory

The transfer function of single input single output dynamic system is defined as:

$$G(s) = \frac{\Upsilon(s)}{X(s)}$$

Where:

Y(s) = laplace transform of the output signal y(t)X(s) = laplace transform of the input signal x(t)



Fig (1-1) Transfer Function block diagram.



Figure (1-2) shows the block diagram for closed loop control system.

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Control System LAB Lecturer : Falah Al-Kayyat NO. 1 and 2 "Mathematical Model Response"

Electric circuits



Fig. (1-3): MATLAB and Simulink representation.

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Control System LAB Lecturer : Falah Al-Kayyat

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NO. 1 and 2

1- (R-C) circuit



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2-(R-L) circuit



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Discussion

- Derive the transfer function of the electric circuits.
- Derive the Laplace transform of a test signal:

f(t) = 3sin wt

