Philadelphia University

Faculty of Engineering

## Course Title:Control Systems – sec. 1Date: 1/5/2019Course No:(610414+640344)Time Allowed: 5

Course No: (610414+640344)	Time Allowed: 50 minutes
Lecturer: Dr. Mohammed Mahdi	No. of Pages: 1

## Objectives: This question is about finding time response.

Given the general transfer function of first order control system  $\frac{Y(s)}{R(s)} = \frac{k}{\tau s + 1}$ . If **R(s) is unit** 

step input, it is required to find y(t), then calculate y(0),  $y(\tau)$  and  $y(\infty)$ .

## Question 2:

R

**Question 1:** 

## **Objectives:** This question is about Mason's Gain formula and absolute stability.

A) Given the following signal flow graph: -

 $G_1G_4$ 

 $G_3$ 

 $G_2$ 

It is required to find its closed loop transfer function using Mason's Gain formula. (30 Marks)

B) Given the closed loop transfer function  $\frac{Y(s)}{R(s)} = \frac{K}{s(s^2+s+1)(s+2)+K}$ , it is required to

find the range of gain K for stability using Routh-Herwitz criterion. (30 Marks)

Dept. of Electrical Engineering Second Exam, Second Semester: 2018/2019

Student Name:

Student Number:

(40 Marks)

(60 Marks)

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