EIE3123 Quiz 4

Name: Sze Kin Sang

Student No. 19062606D

(a)

Assume the system involves neither integrator(s) nor dominant complex-conjugate poles, the transfer function of the system can be approximated by , since the transfer function given = ,

K = 1

L = 2

T = 3

According to the Zeigler-Nichols Tuning Table,

Table

Description automatically generated

The PID controller parameter:

KP = 1.2(3/2) = 1.8

Ti = 2(2) = 4

TP = 0.5(2) = 1

The PID controller transfer function:

(b)

Since the system becomes marginally stable at ,

Therefore,

It is proved since .

Table

Description automatically generated

The optimal PID controller parameter:

Kp = 0.6(3.044) = 1.8264

Ti = 0.5(7.884362) = 3.942181

TP = 0.125(7.884362) = 0.985545