Tutorial – PID control

Q1 (A-10-1)

Describe briefly the dynamic characteristics of the PI controller, PD controller, and PID controller.

Q2 (A-10-2)
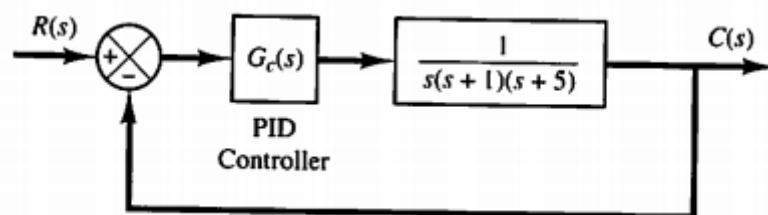
Plot a Bode diagram of a PID controller given by

$$G_c(s) = 2.2 + \frac{2}{s} + 0.2s$$

Q3 (Ex-10-1)

Consider the control system shown in Figure 10–7 in which a PID controller is used to control the system. The PID controller has the transfer function

$$G_c(s) = K_p\left(1 + \frac{1}{T_i s} + T_d s\right)$$

Use the Ziegler-Nichols Stability Method to obtain the parameter of the tuning values.

Q4 (EE3005-17-18Q8)

(a)   Give 3 reasons why it is difficult to tune the PID values to their optimum values.   (5 marks)

(b)   Using a step-by-step approach, describe you would tune a PID controller, using the Ziegler and Nichols transient response method.   (5 marks)