

Total No. of Questions :6]

SEAT No. :

P264

[Total No. of Pages :2

Oct./BE/ Insem. - 582

B.E. (Chemical)

PROCESS DYNAMICS AND CONTROL

(2015 Course) (Semester - I) (409341)

Time : 1 Hour]

[Max. Marks :30

Instructions to the candidates:

- 1) *Answer Q.1 or Q.2, Q3 or Q.4, Q.5 or Q.6*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Assume Suitable data if necessary.*

Q1) a) Explain using a suitable example, what contributes as the design elements of the control systems. **[5]**

b) Derive transfer function for a thermometer. **[5]**

OR

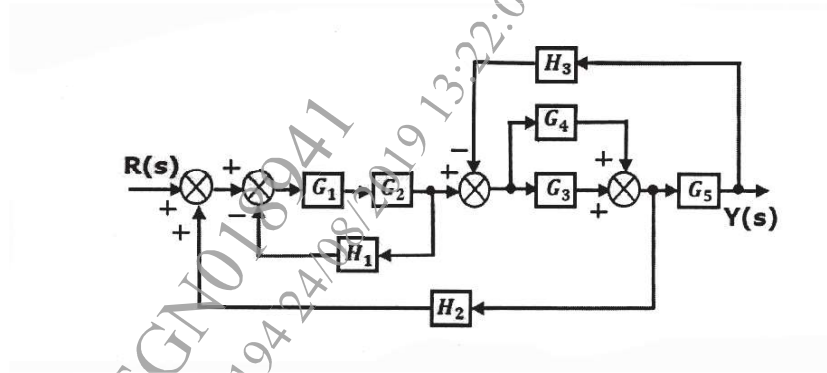
Q2) A thermometer having first order dynamics is placed in a temperature bath at 50°C. After the thermometer reaches equilibrium with the bath, the bath temperature is subjected to sinusoidal forcing function about its average temperature of 50°C with amplitude of 10°C. If the period of oscillation is 3 sec/cycle and the time constant of the thermometer is 10 seconds.

Find out:

- i) Amplitude ration
- ii) Phase angle,
- iii) Max. and min. temperature indicated by thermometer. **[10]**

P.T.O.

- Q3)** Reduce the following block diagram and obtain the transfer function for $Y(s)/R(s)$. [10]



OR

- Q4)** Discuss about the servo and regulator problems. [10]

- Q5)** Discuss about the Controller tuning using process reaction curve by Cohen-Coon technique [10]

OR

- Q6)** List and explain down the various techniques under time integral performance criteria. [10]

