B.Tech. SEM -VII (Chemical 2014 Course (CBCS) : WINTER - 2018

SUBJECT: PROCESS DYNAMICS AND CONTROL

Date: Friday | Time: 02.30 PM TO 05.30 PM

Day: 30/11/2018 | Max. Marks: 60

W-2018-2523

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data, if necessary.

Q.1 A thermometer follows first order dynamics with time constant 0.3 minutes. It is placed in temperature bath at 100^0 C and is allowed to reach steady state it is suddenly transferred to another bath at 180^0 C at time t = 0 and is left there for 0.2 minute. It is immediately returned to the original bath at 100^0 C. Calculate it's reading at: **i)** t = 0.2 minute **ii)** t = 0.4 minute **(10)**

OR

Q.1 Derive response equation for first order system with physical example. **(10)**

Q.2 Derive response equation for U Tube manometer. **(10)**

OR

Q.2 Describe second order system with physical example. **(10)**

Q.3 What is order of closed loop dynamic response for with PI control? Can the PI control destabilize such a process? **(10)**

OR

Q.3 Discuss the effects of tuning parameters on the closed response of a process controlled with PID. **(10)**

Q.4 Describe routh test for stability with example. **(10)**

OR

Q.4 Sketch the root locus for following system. $G(s)\frac{k}{s(s+4)(s+2)}$. **(10)**

Q.5 Draw Bode plot for **i)** PI Controller **ii)** PD Controller **(10)**

OR

Q.5 Describe stability criteria for **i)** Bode plot **ii)** Nyquist plot **(10)**

Q.6 Write a note on cascade control system **(10)**

OR

Q.6 Write a short note on:

a) Override Control **(06)**

b) Split range control **(04)**

* * * * *